# **CHAPTER 6**

# **RECOMMENDED PLAN**

## CHAPTER 6 RECOMMENDED PLAN

This chapter provides details on the Recommended Plan, as determined in the preceding chapters of this report, and as modified per the comments received from higher Corps authorities, the public, and various local, state and Federal agencies during the 90-day public review period, which ended August 14, 1998. These comments, with appropriate responses, are included in Appendix N of this document. The revised, detailed cost estimate for this plan is shown in Appendix K. In addition, the costs and economic analyses presented in this chapter were updated to reflect October 1998 price levels and the current Federal interest rate of 6-7/8%. Federal and non-Federal cost apportionment data for implementation of the plan are also presented.

The Recommended Plan would consist of flood damage reduction features, with associated environmental mitigation requirements, environmental restoration features, including a chain of wetlands, and recreation amenities. Due to the complexities of displaying all the features at a legible scale, figure 6-1 presents the features of the Recommended Plan, excluding recreation. Figure 6-2 shows all the project features of the Recommended Plan, but at a reduced scale.

#### PLAN FEATURES

#### CHAIN OF WETLANDS AND CHANNEL REALIGNMENT AT IH-45

The chain of wetlands portion of the proposed project would consist of an upper wetland chain, with four separate wetland cells, and a lower wetland chain, with three separate cells, each of various lengths and shapes. During flooding, the upper and lower chains would act as flood control channels to convey flood waters to outfalls east of IH-45 and north of Loop 12, respectively. During non-flood periods, the chains would serve as wetland areas for various wildlife and aquatic growth. Each cell would have a concrete stoplog inlet control structure and a standard concrete headwall outlet structure, connected by 36-inch diameter reinforced pipe. The typical section of a wetland cell would vary in depth from 1.5 feet to 7 feet, with various slopes and shelves to support aquatic life and vegetation. These wetland cells are described and shown in more detail in Appendix C.

Flooding from the Trinity River would be the main source of water for the wetland cells; however, in times of low flows or drought, water would be pumped from an existing wetland cell just north of the Central Wastewater Treatment Plant.

Drilling and testing operations were conducted in the proposed project area to ascertain geotechnical data, HTRW data, and cultural resource information. Geotechnical parameters developed as a result of this drilling and testing are discussed in Appendix B. Results of HTRW testing are explained in detail in Appendix J, while significant cultural/historic resource information is presented in Appendix H.

Quantities and costs for the chain of wetlands are provided in Appendix K. Since the chain of wetlands would include both flood control features and environmental restoration features, these quantities were calculated separately. Real estate costs for the swale were estimated at \$13.7 million, including \$2.6 million for mitigation lands. Environmental mitigation costs for the flood control portion of the chain of wetlands, excluding lands, were estimated at \$0.3 million.

A review of preliminary HTRW investigations indicated the presence of lead-containing leachate at the Linfield Landfill site, through which the lower chain of wetlands would traverse. Avoidance of this area has been restricted by the presence of a historic neighborhood on the west side of the landfill, and the river on the east. The chain of wetlands has been designed at the extreme western boundary of the landfill in order to avoid more hazardous materials thought to be present in the eastern portions of the landfill. Alternatives which would provide for construction of a channel on the east side of the river, opposite the landfill, have been vigorously opposed due to

the environmental significance of the "Great Trinity Forest" which encompasses that area. A slurry trench was designed to prohibit leachate from entering the swale from the landfill during and after construction, and a three-foot cover of select material was proposed for the exposed material within the swale. More detailed investigations completed in November 1998 concluded that the leachate did not warrant classification as hazardous waste, but could be handled as Class I industrial waste. Detailed results of the HTRW investigations are provided in Appendix J.

#### **Channel Realignment at IH-45 Bridge**

The proposed trapezoidal channel would be approximately 3,300 feet in length, with a 30foot bottom width, 3H:1V side slopes, and a top width of approximately 180 feet. The existing river channel in the reach where the realignment is proposed has an average bottom slope that is nearly zero. Therefore, the proposed channel realignment section has been designed with a zero bottom slope from beginning to end. The proposed channel would have an average depth of 15 feet and has been designed to closely approximate the channel flow capacity and the flow velocities of the existing river channel. The proposed channel alignment would be centered between the nearest 320-foot span of the IH-45 bridge. Excavation around the piers would not be required. The proposed realignment will result in the channel being moved laterally a maximum distance of about 350 feet.

The existing channel would be filled to the existing top of bank elevation 396.0 to prevent further collection of debris. Relocation of the channel would result in modifications to the existing Central Mitigation Swale, which would be reduced in size by filling of the portion of the swale near the proposed channel realignment. A minimum of 150 feet from the top of bank of the proposed river channel realignment to the top of the bank of the Central Mitigation Swale would be required.

Several alternatives regarding filling of the old river channel have been investigated. The investigated alternatives would accomplish the primary goals of the IH-45 bridge channel realignment project to some degree, but the proposed plan for the channel realignment would accomplish these goals with a minimal risk to the bridge structure and a minimal filling of the old channel. The primary objectives of the project would be to reduce the risk of damage to the bridge piers from floating debris and reduce or eliminate the cost of continual maintenance to remove the debris and periodically repair the structure. The proposed plan to fill the old channel would be to fill from the upstream diversion of the river channel to the downstream side of the bridge. The fill would be placed up to the level of the existing overbank areas at the approximate elevation of 396.0 and would be placed around the existing bridge piers located within the old channel. This alternative was deemed the only partial channel fill plan that would ensure complete diversion of channel confined flows and minimize the risk to the existing bridge piers. The channel fill would terminate at the downstream end with a very gradual slope to the streambed of the old channel just downstream of the bridge piers. A portion of the old channel downstream of the IH-45 bridge would remain unfilled. This unfilled portion of the old channel would provide a slack water area for use as a possible river access point, and may provide some habitat diversity near the river. The filled portion of the old river channel would maximize the diversion of channel confined river flows to the new channel alignment, stabilize the bridge piers in the old channel, and minimize the risk of floating debris collecting on the bridge piers. TxDOT maintains an access road directly beneath the IH-45 bridge which provides access to the river channel from either side of the river. Filling of the old river channel beneath the bridge, as proposed, would provide continued access to the river channel for inspection and maintenance. A plan view of the proposed relocation of the Trinity River channel at IH-45 may be found in Appendix C.

Approximately 287,200 cy of excavation would be required for this channel, and approximately 60,300 cy of fill would be placed within the existing channel, as described above. The total construction cost for the channel realignment proposal was estimated at approximately \$2.0 million, and would provide annual benefits of \$1.0 million. Approximately 71 acres of mitigation would be required for this work effort.



Public Park Lands

Other Public Lands

**Proposed Project Lands** 

Proposed Wetlands

U.S. ARMY ENGINEER DISTRICT, FORT WORTH CORPS OF ENGINEERS FORT WORTH, TEXAS

GENERAL REEVALUATION REPORT TRINITY RIVER, TEXAS DALLAS FLOODWAY EXTENSION

**RECOMMENDED PLAN** 

FIGURE 6-1



#### Summary

Total costs for the flood control portion of the chain of wetlands and channel realignment at IH-45, including preconstruction engineering and design and construction management were estimated at approximately \$59.1 million. The addition of \$14.2 million for the non-Federal CWWTP Levee upgrade, in accordance with Section 351 of WRDA 1996, brought the total estimated cost for the flood control portion of the chain of wetlands increment of the Recommended Plan to approximately \$73.3 million.

The detailed cost estimate for the environmental restoration features of the chain of wetlands increment of the Recommended Plan, including preconstruction engineering and design and construction management was calculated at approximately \$5.6 million, with an annualized cost of approximately \$465,800. Table 6-1 presents the breakdown of costs per unit of output for the final environmental restoration plan, as derived through incremental analyses in Chapter 4, and in Appendix F, of this document.

#### Table 6-1

Analysis of Environmental Restoration Features

(October 1998 prices, 6.875% interest, 50-year period of analysis)

	Annual Cost	AAHU Oulput	Cost / AAHU
Environmental Restoration	\$465,800	184	\$2,532

#### LAMAR LEVEE

The proposed Lamar Levee would extend over a total length of 16,419 feet, with top of levee elevations varying from 417.0 at the downstream end to 426.0 at the upstream end. The average height of the levee would be 17.6 feet, with a maximum height of 31.0 feet. A 20-foot crown width and 1 vertical to 4 horizontal side slopes would be utilized, based on performance of existing levees within the area, and on a slope stability analysis. The alignment of the levee would impact the Southern Pacific (S.P.) Railroad at one location and the Missouri-Kansas-Texas (M.K.T.) Railroad at one location, requiring 20-foot wide stoplog structures at each site, with heights of 8 feet and 14 feet, respectively. No major roads would be impacted by gated structures; however, at the junction of the levee with Martin Luther King Boulevard, the levee was realigned to reach a higher ground tie-in point. The downstream end of the levee would tie into the previously constructed Rochester Park Levee. This non-Federal levee has a top of levee elevation of only 415.0, thereby requiring raising of a portion of the Rochester Park Levee to transition into the downstream Lamar Levee elevation of 417.0. Two major freeway bridges would cross the proposed levee, but would require no modification since the low chord beam elevations would be well above the top of the levee. Detailed descriptions and drawings of this levee are included in Appendix C of this report. Excavation of almost 600,00 cubic yards of material would be required for construction of sumps behind the levees, as described in Appendix A.

Various utilities would be affected by the alignment of the levee and the location of the sumps, and relocation procedures would be required prior to construction. Sanitary sewer lines, storm sewer lines, and fiber optic cables would require relocation, as described in Appendix C. Relocation costs were estimated to total approximately \$3.4 million for the Lamar Levee. In addition, five sluice structures would be required for discharge of sump areas through the levees. These structures, as well as all closure structures, are described and presented in Appendix C. The geotechnical design and structural design parameters are provided in Appendix B and Appendix C, respectively.

Real estate costs for the Lamar Levee were estimated at approximately \$5.8 million, of which \$1.0 million would be relocation assistance costs for displaced persons and business, and \$1.4 million would be for mitigation lands. Environmental mitigation costs, not including lands, were estimated at \$0.2 million. The breakdown of these costs is provided in Appendix E, and in the detailed cost estimate shown in Appendix K.

No known HTRW sites would be affected by construction of this levee and associated sumps, as the sumps have been relocated to avoid potential HTRW sites. It is noted, however, that further testing may reveal HTRW sites which are unknown at this time. Should such sites be discovered, for which avoidance were not possible, the costs for removal of the contaminated material would be the responsibility of the sponsor. More detailed results of the HTRW investigations are presented in Appendix J.

The total economic costs for the Lamar Levee increment of the Recommended Plan were estimated at \$18.3 million, including preconstruction engineering and design and construction management. Since a portion of the Rochester Park Levee would be compatible with the Lamar Levee, the costs for this compatible portion, totaling approximately \$8.9 million, were added to the Lamar Levee. The total cost of the Lamar Levee, therefore, was estimated at \$27.2 million.

#### CADILLAC HEIGHTS LEVEE

The Cadillac Heights Levee would extend over a total length of 11,891 feet, with top of levee elevations varying from 421.5 at the downstream end to 426.0 at the upstream end. The average height would be 14.9 feet, with a maximum height of 25.75 feet. The crown width would be 20 feet, with side slopes of 1 vertical to 4 horizontal, based on performance of existing levees within the area, and on a slope stability analysis. Four flood control closure structures would be required at railroad and street crossings. The M.K.T. Railroad would cross the levee three times, thereby requiring three 20-foot wide stoplog structures, the heights of which would vary from 6.5 feet to 17.5 feet. One floodgate would be required at Martin Luther King Boulevard, and would measure 65 feet wide and 5 feet high.

Approximately 600 feet of the existing non-Federal levee surrounding the CWWTP, near the entrance, would be utilized by raising the levee six feet.

Sump requirements for the Cadillac Heights Levee would be non-existent; however, four sluice structures would be provided for drainage of the areas behind the levees.

Various sanitary sewer lines, storm sewer lines, water supply lines, electrical supply towers, and the roadway entrance to the CWWTP would require relocation and/or reconstruction.

Detailed drawings and descriptions of each of these design and relocation elements are presented in Appendix C.

Real estate costs for the Cadillac Heights levee were estimated to be \$6.1 million, of which \$3.1 million would be for relocation of displaced persons and businesses, and \$0.2 million would be for mitigation lands. Environmental mitigation costs, not including lands, were estimated at \$0.02 million.

Preliminary investigations, prior to the release of the draft GRR/EIS in May 1998, indicated no known HTRW sites would be affected by construction of this levee. After release of the draft GRR/EIS, and prior to the preparation of the Final GRR, follow-on site visits in the vicinity of Area 9 (as defined in Appendix J) identified construction underway in the southern portion of Area 9 (Darling International). Examination of TNRCC files was conducted to determine the purpose and nature of the activities in the southern portion of Area 9. The examinations revealed new documents that confirm the presence of hazardous levels of lead in the southern portion of Area 9. Given a similar site history, it is likely that hazardous levels of lead exist in the northern portion of Area 9 (Energy Conversion Systems). The current owners of the northern portion of Area 9 will be performing investigations, but results are not yet available.

The hazardous levels of lead at Area 9 appear to be associated with buried lead slag and battery casings. It does not appear that the high levels of lead extend beyond the immediate area being capped. This conclusion is supported by data obtained from construction of an adjacent 120-inch interceptor line by the City of Dallas. The interceptor line runs parallel to the Trinity River and immediately adjacent to Area 9. Data developed for the City of Dallas along the new interceptor line indicate total lead levels up to 1000 mg/Kg to a depth of 6 feet. These samples tested to be non-hazardous, however, with a maximum Toxicity Characteristic Leaching Procedure (TCLP) value of only 0.22 mg/L. TCLP values that are equal to or greater than 5.0 mg/L are considered to be hazardous for lead.

Refinement of the Cadillac Heights levee alignment in this area will be a priority for future investigations. Final design will balance disturbance of known contaminants, costs for handling and disposal of special wastes, and impacts to natural resources.

The economic costs for the Cadillac Heights Levee increment of the Recommended Plan were estimated at \$9.3 million, including preconstruction engineering and design and construction management.

#### **INTERIOR DRAINAGE - SUMP AREAS**

In the final analyses of the Recommended Plan, specific efforts were undertaken to evaluate the potential for increasing the economic effectiveness of the initial design proposals. However, based on current USACE policy, only the subtle changes in potential flood damages around the interior drainage facilities which result from variation of the proposed design were eligible as measures of the benefits to be gained (or lost) under alternative design scenarios. Since many of the adjacent improved properties are comprised of warehouse-style construction, significant increases in the residual flood damages would require that the potential pool levels in the interior facilities be raised several feet, causing impoundment over substantially larger acreages than that resulting from the initial design conditions. The larger flooding area, in and of itself, is not reflected in direct flood damages, under the current economic assessment strategy. Residual flooding damages for a 500-year interior flood event are presented in table 6-2 for the sump areas behind the Lamar Levee. As shown in the table, and for the reasons noted above, the residual damages are very minimal for this area. It was estimated that there would be no annualized residual damages in the Cadillac Heights sump areas.

It is clear that larger interior drainage facilities can not be economically justified, given these constraints. Smaller facilities may be economically justified, but those atternatives would not meet the provision that the minimum facilities meet the local sponsor's design standards, as established by ordinance, and would be impractical. The City of Dallas' "Drainage Design Manual" (May 1993) and the "Dallas Development Code" require a 100-year frequency (0.01 probability of exceedance) design level for these types of facilities.

# Table 6-2Cumulative Residual Single-Event and Annualized DamagesFor Lamar Levee Sumps

Maria and an	Stimp 1	Sump 2	Sump 3	Siden 9.4	Siump 6	Total
<100	\$0	\$ <del>0</del>	\$0	\$0	\$0	\$0
50	\$0	\$0	\$0	\$0	\$0	\$0
20	\$0	\$0	\$0	\$0	\$0	\$0
10	\$0	\$0	\$0	\$0	\$0	\$0
4	\$0	\$0	\$0	\$0	\$0	\$0
2	\$0	\$0	\$0	\$0	\$0	\$0
· 1	\$0	\$0	\$0	\$0	\$0	\$0
.4	\$43,396	\$11,411	\$223,538	\$0	\$0	\$278,345
.2	\$60,344	\$119,551	\$331,458	\$0	\$0	\$511,353
Annualized *	\$700	\$910	\$5,810	\$0	\$240	\$7,660

(October 1998 prices, 6.875% interest, 50-year period of analysis)

\* The annualized damages were derived using the risk and uncertainty program, while cumulative single-event damages were not. Damages were shown for Sump 5 only upon application of the risk and uncertainly analysis. It was estimated that there would be no residual damages for the Cadillac Heights sump areas.

As stated previously, the sumps along the proposed Lamar Street Levee would be situated from upstream to downstream as follows, and as shown in figure 6-1. The first would be located immediately southeast of the Dallas Area Rapid Transit (DART) rail line. It would require no excavation, but would inundate 1.68 acres under the design condition. The second would be located at the southwest "dead" end of Forest Avenue. It would require some limited excavation (on the southwest side of an existing commercial activity) and would inundate 1.80 acres under the design condition. The third would straddle the Missouri-Kansas-Texas (MKT) Railway and occupy the long triangular area bounded by that railway, the Southern-Pacific (SP) Railway, and the proposed Lamar Street Levee. It would require extensive excavation and would inundate 17.10 acres under the design condition. The fourth would be located beneath the north end of the Interstate Highway 45 (Julius Schepps Freeway) bridge over the Trinity River valley. It would require no excavation, but would inundate 8.08 acres under the design condition. The fifth would be located along the northeast side of the SP Railway, behind the active commercial entities along the more southeastern end of Lamar Street. It would require substantial excavation and would inundate 12.20 acres under the design condition.

The interior drainage facilities (sluice structures) along the proposed Cadillac Heights Levee, none of which would require significant excavation or would be expected to create a significant area of inundation, would be situated from upstream to down:stream as follows. The first would be located west of Martin Luther King Jr. (Cedar Crest) Boulevard. The second would be located adjacent to the west side of the MKT Railway, at the point where it crosses the northeastern leg of the proposed levee alignment. The third would be located several hundred feet east of the MKT Railway. The fourth would be located adjacent to the MKT Railway, at the point where it crosses the southern leg of the proposed levee alignment.

Those sump areas which would be excavated would have three-on-one side slopes, and generally flat bottoms (sloped very slightly to the outlet). The outlet sluice facilities are proposed as simple rectangular conduits with both a flapgate (at the outlet end) and a manually operated sluice gate. Pertinent data on the sumps and outlet sluice structures, including hydrologic effects, are presented in table A-9 of Appendix A.

#### **RECREATION AMENITIES**

The recreation plan for the proposed project was designed to meet existing needs for passive and non-structured recreational activities within the regional service area, and to address state and regional shortfalls in facilities for walking, hiking, cycling, and jogging, as identified in the TORP. Facilities proposed for this project would be necessary to provide public access, protect sensitive environmental resources and promote safe use of the area. The proposed plan would create linkages between existing recreational areas and public open space areas, both existing and necessary for the DFE project. Proposed access points would take advantage of existing facilities within local parks and preserves, to the extent possible. The plan would be consistent with locally adopted recommendations for long range development of a "Great Trinity Forest Park" within the DFE area. Facilities proposed for the recreation plan are described below. More detailed discussions and drawings of this proposed plan and the regional recreation master plan are presented in Appendix I.

#### Trails and Access Points

The proposed project would include 18 miles of 10-foot wide, 4-inch thick reinforced concrete on compacted subgrade. The plan would also include 8.5 miles of natural surface equestrian trails and 5 miles of natural surface nature trails. A total of seven access areas are proposed, three of which would be located at existing parks or areas with adequate existing parking areas. These areas are located at Moore Park near Cedar Creek, at Woodland Springs Park near the McCommas Bluff Preserve, and at IH-45 near the Central Wastewater Treatment Plant. Each of these areas would need an entry sign, a 30-foot by 60-foot picnic pavilion, and a trailhead with an informational kiosk. The clubhouse at the Sleepy Hollow Golf Course is included as an access point, but would require no modifications. One of the three new access areas would be located near the upstream end of the existing Rochester Park levee, with another located on the east side of the Trinity River across from Lemmon Lake, and the final one located at the southern end of the study area near IH-20. The new access areas would require concrete entry drives and parking spaces to accommodate 20 cars each, with adequate turn-around space for busses and trailers. Each area would also need an entry sign, a 30-foot by 60-foot picnic pavilion, a trailhead with an informational kiosk, security lighting, and a drinking fountain and hose bib. Typical details for the concrete hike/bike trail and access areas are shown on Plate C33 in Appendix C,

#### Structures

Two pedestrian bridge structures would be provided for access across the river channel. The bridges would typically consist of three 50-foot prestressed concrete beams and would be designed to support light maintenance vehicles. Plate C33 in Appendix C shows typical details for the proposed structures.

Costs for the recreation amenities, including preconstruction engineering and design and construction management were estimated at \$6.8 million.

#### OPERATION, MAINTENANCE, REPAIR, REPLACEMENT AND REHABILITATION

The Federal Government and the city of Dallas will enter into a local cooperation agreement under which the city will accept the project after completion of construction, and insure operation and maintenance in accordance with Federal regulations. The major items of operation and maintenance include mowing of the levees and sumps, weed control along the concrete trail and nature trail, management of the open space within the project, operation and maintenance of the pumping station and inlet and outlet control structures within the chain of wetlands, and operation and maintenance of stoplog structures and floodgates throughout the project. Table 6-3 provides a breakdown of the estimated OMRR&R costs. An operation and maintenance manual will be prepared by the Fort Worth District after completion of the project, which will include specific,

detailed requirements for the operation and management of the levees, chain of wetlands, and fish and wildlife mitigation areas. These requirements will be developed through coordination with state and federal resource agencies to assure that environmental attributes of the project meet regulatory and agency mandates. In addition to routine operation and maintenance, the city will be responsible for repair, replacement and/or rehabilitation of all components and features of this project. Periodic inspections will be performed to insure that all required maintenance is being performed.

Table 6-3
Breakdown of OMRR&R Costs
(October 1998 prices)

	ESTIMATED ANNUAL COST
CHAIN OF WETLANDS:	
Mowing/clearing	\$20,000
Debris clean-up	\$18,000
Pump replacement (once every 25 years)	\$2,000
Iniet/outlet structure operation/maintenance	\$10,000
Millgation ereas for chain of wetlands	\$24,000
Total - Chain of Wetlands	\$74,000
LEVEES (including Rochester Park & CWWTP)	
Mowing - levees /	\$200,000
Mowing - sumps	\$75,000
Repair of maintenance road on levees	\$35,000
Debris removel - sumps	\$75,000
Floodgates / closure structures maintenance	\$25,000
Sluice structure operation/maintenance	\$35,000
Miligation areas for levees .	\$8,000
Total - Levees	\$453,000
RECREATION:	4
Maintenance / debris clean-up at pavilions	\$4,000
Replacement of trail at 25-years	\$50,000
Maintenance / cleaning of trails / bridges	\$8,000
Resurfacing / restriping of access areas at 10- year intervals	\$6,000
Sign repair / lighting	\$5,000
Total - Recreation	\$73,000
70741	\$800.000

#### ENVIRONMENTAL COMPLIANCE

#### **EXECUTIVE ORDER 11988 - FLOODPLAIN MANAGEMENT**

The spirit and intent of Executive Order 11988 have been considered in preparation of this action. There are no feasible alternatives to conducting activities within the 100-year floodplain of the Trinity River, and measures have been considered to minimize impacts to the floodplain through project design. Additionally, the city of Dallas currently has several programs for management of the Trinity River 100-year floodplain following project implementation. The city is a participant in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program and the Community Rating System (CRS). The city maintains a Corridor Development Certificate from the North Central Texas Council of Governments (NCTCOG), has a Flood Warning System for the Trinity River Basin and a Flood Plain Ordinance which regulates development in the floodplain.

Future floodplain impacts will be controlled through the development of a comprehensive Floodplain Management Plan (FPMP). An FPMP will be developed by the city in accordance with Section 202(c) of the Water Resources Development Act of 1996 and the guidance provided by the Secretary of the Army. The FPMP will be developed within one year after the signing of the Project Cost Sharing Agreement and implemented within one year after completion of construction of the project.

#### SECTION 404 CLEAN WATER ACT

The Corps of Engineers has been directed by Congress under Section 404 of the Clean Water Act (33 USC 1344) to regulate the discharge of dredged and fill material into all waters of the United States, including adjacent wetlands. The intent of Section 404 is to protect the nation's waters from indiscriminate discharge of material capable of causing pollution, and to restore and maintain the chemical, physical and biological integrity of these areas. Although the Corps of Engineers does not issue itself permits for proposed activities which would affect waters of the United States, the Corps must meet the legal requirements of the Act. Section 404 (r) of the Clean Water Act waives the requirement to obtain a State Water Quality Certificate provided information on the effects of the discharge of dredged or fill material into waters of the United States, including the application of the Section 404(b)(1) guidelines, are included in an environmental impact statement (EIS) on the proposed project, and the EIS is submitted to Congress before the actual discharge takes place and prior to authorization or appropriation of funds for project construction. A Section 404(b)(1) analysis has been completed and is presented in Appendix F.

#### SECTIONS 9 AND 10 RIVERS AND HARBORS ACT

Section 9 (33USC 401) and Section 10 (33USC 403) of the Rivers and Harbors Act of 1899 direct the Corps to regulate all work or structures in or affecting the course, condition, or capacity of navigable water of the United States. The mainstem of the Trinity River at Dallas is navigable; however, no commercial navigation occurs on the Upper Trinity reach. Recreational use in the form of canoeing, fishing and pleasure boating occurs, but only to a limited extent and then only during less than flood flow events. The proposed project features would have minimal affect to navigation. The footprint of the chain of wetlands lies in the floodplain adjacent to the mainstem.

The Corps of Engineers completed an Environmental Impact Statement and a Record of Decision (ROD) in 1988 that addressed the cumulative impacts of a number of unrelated independent proposed actions within the Upper Trinity River Basin. The authority for the study was based upon the Corps regulatory requirements. The results of the EIS gave strong indications that there are potential cumulative impacts associated with individual floodplain developments that are both measurable and significant. Public comment and discussion focused on the undesirability of additional regional increases in flood hazards for either the 100-year or Standard Project Flood and

that floodplain management should stabilize the flood hazard at existing levels through regulation and efforts of both the Corps and local organizations. The ROD provided a framework of criteria that would become the basis for the Regulatory Program within the Regional EIS study area. The Regulatory Program includes those actions proposed by the Corps of Engineers that are subject to Section 404, Section 9 or 10 compliance.

Hydraulic criteria applicable to the Dallas Floodway Extension area include that no rise in the 100-year or SPF elevation will be allowed, the maximum allowable loss in storage capacity for the 100-year and SPF discharges will be 0% and 5% respectively, alterations of the floodplain may not create or increase an erosive water velocity on or off site, and the floodplain may be altered only to the extent permitted by equal conveyance reduction on both sides of the channel. The proposed action will also be reviewed on the assumption that adjacent projects would have an equitable chance to be built, such that the cumulative impacts of both will not exceed the common criteria. In addition, since the proposed project includes levees that protect urban development, the minimum design criterion for the top of levee is the SPF plus 4.0, unless a relief system can be designed which will prevent catastrophic failure of the levee system. Furthermore, the ROD provides criteria for mitigation of unavoidable losses to special aquatic sites including wetlands and guidelines for mitigation of other important resources.

The ROD also provided that variance from the criteria would be made only if public interest factors not accounted for in the Regional EIS overwhelmingly indicated that the "best overall public interest" is served by allowing such variance. During the review of this project proposal by the Corps, other agencies, communities and the public, it will be determined if it meets the ROD criteria or whether resolution of flooding problems of this frequency and magnitude should be deemed as an overriding concern, and if a variance from the Record of Decision should be allowed as being in "the best overall public interest."

2

#### ENVIRONMENTAL JUSTICE

Executive Order 12898 provides for review of proposed activities to assess the effect on minority populations and low income populations. The area of potential project impact was screened and it was determined that the area does contain minority and low income populations. A review of the effects of the proposed project alternatives indicate that all flood control plans, except the combination plan including a non-structural buyout of Cadillac Heights in lieu of a levee, provide significant flood protection for local residents and businesses. The economically feasible buyout of the 25-year flood zone would leave many minority and low income individuals subject to flooding. The proposed Cadillac Heights Levee would provide protection from the Standard Project Flood and would reduce adverse economic impacts of repeated flooding in the area. This levee would impact an existing meat packing facility, but the plant could be relocated immediately adjacent to the existing location, thereby minimizing loss of employment opportunities to local residents.

Should the chain of wetlands be built alone, the majority of the economic benefits would accrue upstream within the Central Business District (CBD), with the negative impacts of forest loss occurring within the floodplain adjacent to the Cadillac Heights and Lamar areas. There would be some flood damage reduction benefits within the immediate area, but not to the same level as provided to the CBD. Other economic benefits from the multi-purpose chain of wetlands project to the minority and low income populations would accrue due to the influx of recreation users of the trail system that would be constructed.

Building the river diversion at IH-45, as requested by the sponsor, to protect a major roadway bridge from catastrophic failure would benefit all people and would not be of detriment to any populations. The Recommended Plan, including the environmental restoration of emergent wetlands, environmental mitigation, and a recreational trail would also provide benefits to the local area. Another benefit of the overall project is the clean-up of accumulations of trash and debris within the projected lands and some of the hazardous and toxic wastes in the project footprint. The proposed project would not result in disproportionate impacts to minority or low income populations. Recognizing the overall balance of benefits and impacts that would occur from the proposed project,

it has been determined that implementation of the Recommended Plan, along with the river realignment at IH-45, would be in compliance with the intent and spirit of Executive Order 12898.

#### CUMULATIVE IMPACTS

This section analyzes the proposed project in the context of current and future trends in the Upper Trinity River Basin. The purpose of this section is to assess the cumulative impacts of the proposed action to the study area, when combined with other known actions in the vicinity of the Dallas Floodway Extension area, as described in the "INTERRELATIONSHIP WITH OTHER PROPOSED ACTIONS" section in Chapter 2. The proposed action, including environmental mitigation, makes little or no contribution to regional trends that are of concern in assessing cumulative impacts.

#### LAND USE

Urbanization has greatly influenced land use patterns within the Dallas area. As additional runoff from upstream areas has increased the frequency of flooding within the study area, and as adjacent urbanization has continued, floodplain land use has shifted away from agriculture, except for a few areas of pasture land. The large floodplain areas adjacent to the river are zoned for industrial development, but, with or without a project it is unlikely that substantial new development will occur in flood-prone areas due to extensive flooding and regulatory prohibitions which are currently in place. Past programs for voluntary removal of some residences and other structures in the more frequently flooded areas have also influenced floodplain land uses. Most abandoned floodplain areas have re-vegetated with grasses, followed by young forests. The proposed project would significantly reduce remaining flood damages which occur within the project area. Most of the areas that would be impacted by the proposed project features are currently in private ownership and would be shifted to public open space with the project. Physical features of the project would directly impact some forest lands that have developed during the past 30 to 40 years; however, these losses would be mitigated resulting in a larger area of preserved and reestablished floodplain forests.

All lands acquired for project features including the area between the proposed levees, the footprint of all project features, and the mitigation areas would no longer be available for uses such as agricultural production or industrial use. These lands would remain in the floodplain as open space but would be available for public uses compatible with the project. The project would result in increased use of floodplain lands for recreation. Recreation trails and flood compatible day use facilities would be developed through project lands and the habitat mitigation area. Development of more intensive recreation facilities is planned by the project sponsor for certain areas within the lands required for the project, including athletic fields and a community center. Direct land use changes caused by the proposed project would be compatible with floodplain functions and should have no negative effects on floodplain uses compared to conditions without the project.

The proposed project would provide reduction in damages to areas in both the Lamar and Cadillac Heights areas that are currently susceptible to flooding. The economic stimulus associated with the project, combined with the reduction in frequency and intensity of flood damages, would result in economic development of lands which would be afforded protection or which are adjacent to the project. Redevelopment would not be expected to occur all at once but over a period of years. The most obvious changes would likely be in the form of redevelopment and reuse rather than direct change from one land use to another. Liability concerns for environmental contamination must be addressed prior to any major redevelopment. This would be largely the responsibility of the developer and would include compliance with both Environmental Protection Agency and Texas Natural Resources Conservation Service requirements, as well as consistency with such programs as the "Brownfields" initiatives administered by those agencies. Although no specific proposals have been identified, it is probable that any industrial redevelopment that may be induced will be "cleaner" than former industrial development in the study area.

With participation in the project, the City of Dallas would be required to prepare a comprehensive floodplain management plan which should address watershed land uses adjacent to and upstream of the project. A primary purpose of this comprehensive plan is to assure that future developments do not increase the potential for future flood damages. The plan would address conditions of the project as assumed to be in-place, along with any other proposals such as may be included in the Upper Trinity Feasibility Study or public or private proposals, such as highways or commercial, residential, or industrial development. Any potential zoning changes proposed by the City of Dallas in preparing this comprehensive floodplain management plan should provide opportunity for public input.

Redevelopment of adjacent neighborhoods and commercial and industrial areas would be cumulatively influenced by the portion of the Texas Department of Transportation's (TxDOT) proposed Trinity Parkway project which would extend from Hwy 175 to the existing Dallas Floodway along the Lamar Street Levee alignment. The number and location of access ramps, as well as aesthetic treatment and noise reduction measures that would be included with TxDOT's proposed extension will affect the type and extent of adjacent land use changes. Those effects will be considered by TxDOT as that agency moves forward with compliance under the National Environmental Policy Act.' One certain effect of the proposed roadway project on land use in the project vicinity would be an economic stimulus resulting from construction. The economic effect of a TxDOT project on land use within the study area would occur even in the absence of the proposed flood damage reduction project. The two proposed projects together, however, would have a combined or cumulative effect on land use. The nature, location, and extent of land use changes or economic redevelopment that would occur cannot be predicted with certainty at this time. Economic development within the project study area will be greatly influenced by the City of Dallas' comprehensive floodplain management plan, and by features of TxDOT's proposal for the Trinity Parkway as they move along in the planning and public involvement process.

#### CULTURAL AND HISTORIC RESOURCES

Any impacts to cultural and historical resources would be mitigated, according to provisions of the National Historic Preservation Act. Therefore, the proposed action would make no contributions to cumulative impacts of the area.

#### NOISE

All noise impacts directly attributable to the project would be temporary in nature. Levees would tend to interfere with the distribution of some noises. Some noise associated with roadway traffic could be redistributed to the area should the Texas Department of Transportation decide to utilize existing and proposed levees for reliever roads.

#### CLIMATE AND AIR QUALITY

The proposed project would have only minor impacts to local temperature and air quality parameters. There would be no measurable impacts to climate. Cumulative impacts to air quality would be insignificant, since environmental mitigation would result in an overall increase in the size of preserved and restored forested areas. Should roadways be developed, by others, on or adjacent to existing or proposed levees, the additional movement of vehicles past the project area would result in an increase in ozone-forming precursors. The impacts associated with development of this or other proposals would be determined during detailed studies by the entities proposing the projects.

#### HYDROLOGY AND WATER RESOURCES

Hydrologic and hydraulic analysis to determine the impacts of valley storage changes resulting from implementation of the Recommended Plan was performed. Valley storage changes in the project reach would result from both the reduction of peak water surface elevations and the function of levees blocking flood water access to the areas of the floodplain that would be protected by the levees. The analysis indicates that a reduction in the valley storage in the project reach would result in an increase in the peak discharges. This increase has been computed and is expressed in terms of an increase in the peak water surface profile downstream of the project. The water surface profile elevations would be increased an average of 0.15 feet for the 1 percent chance flood and 0.3 feet for the SPF. Based on these small increases and the very limited potential for flood damages downstream of the project, a variance from the criteria requiring mitigation for reduction of valley storage and no allowable rise in the 1 percent chance flood and SPF elevations should be allowed. The variance from these requirements, as stated in the Corridor Development Certificate (CDC) Manual and the Trinity River Environmental Impact Statement Record of Decision (ROD), would be further justified in light of the very broad ranging economic benefits accruing to the residents, commercial activities and public service facilities within the project reach as well as upstream of the project reach. The proposed project would provide SPF protection to over 2,500 structures in the immediate study area, which currently have no such protection, and increase flood protection to over 10,000 structures in the reaches of the existing Dallas Floodway. Careful consideration of these factors indicate that the best overall public interest would be served by allowing such variance. The granting of variances from the CDC and ROD for this flood damage reduction project would not set a precedent that would alleviate the compliance requirements for other floodplain development alteration projects. The criteria would continue to significantly reduce cumulative impacts to hydrologic and hydraulic conditions. In addition, any future Corps project proposals would not reduce the hydrologic and hydraulic benefits which would be derived from implementation of the proposed DFE project.

#### ECOLOGICAL RESOURCES

The most significant resource within the proposed project area has been identified as the bottomland hardwood forest ecosystem located in an area referred to as the "Great Trinity Forest". While the proposed project would impact only a small area of the forest, the proposed environmental mitigation plan could provide a catalyst to ultimate acquisition and management of over 1,000 acres of the area which is either currently forested, or could be converted to bottomland hardwood forest through intensive management. In addition, the proposed environmental restoration project, which includes the development of emergent wetlands, would help reverse the trend of losses to this important resource.

#### ECONOMIC ANALYSIS

As stated in Chapter 5, equivalent annual damages (EAD) were calculated for the Recommended Plan to account for changes in urbanization and hydrology. The analysis was performed over a 50-year period from the year 2000 to 2050.

#### **RECREATION BENEFITS**

Benefits for the recreation plan developed for the final array of alternatives were derived using the unit day value method. This method of benefit calculation was selected based on the criteria set forth in ER 1105-2-100. Specifically, the regional model available is more than seven years old, annual visits are not expected to exceed 750,000, and recreation costs are not expected to exceed 25 percent of the total project costs.

A score of 40 points was assessed for the plan based on the professional judgement of both Federal and local recreation planners. Applying the current Planning Guidance Memorandum, a score of 40 points converts to \$5.09 per visitor-day, at October 1998 price levels, for quantifiable features. The benefits were derived based on 31.5 miles of trails, 34 picnic tables and 6 picnic pavilions. Refer to Appendix I for complete details on the recreation master plan. Table 6-4 details the benefits calculated for the recreation plan by feature. The participation rate in the Dallas/Fort Worth area for multi-purpose trails and pavilions exceeds the facility capacity; therefore, it is assumed that participation equals capacity and a value of one was applied. Annual visitors per miles of equestrian and nature trails were adjusted by the participation rate for the local area.

## Table 6-4

### Dallas Floodway Extension Recreation Benefits Unit Day Value Method

(October 1998 prices, 6.875% interest, 50-year period of analysis)

	American	Participation	Malanas	Della	Annual
Reature		2141(-2			
Hike\Bike Trail	18	1.0	57,662	\$5.09	\$5,280,500
Equestrian Trail	8.5	0.2	6,999	\$5.09	\$60,500
Nature Trail	5	0.6	7,402	. \$5.09	\$113,000
Picnic Tables	34	1.0	1,575	\$5.09	\$272,400
Pavilion	6	1.0	1,665	\$5.09	\$50,800
			<b>Total Bene</b>	fits	\$5.777.200

#### COST ANALYSIS

#### **Project First Cost**

The project first cost includes estimates for lands and damages, relocations, fish and wildlife facilities, channels (swale and chain of wetlands), levees, recreation facilities, cultural preservation, removal of hazardous and toxic waste, engineering and design, and construction management. Contingencies were added on selected items in accordance with the level of confidence associated with the item. Construction cost data were developed using material, equipment, and labor costs typical for work of this nature in the Dallas area. Real estate costs were developed after the Gross Appraisal was completed. A cost estimate summary for the Recommended Plan is found in table 6-5, and shows a total project cost of \$127.2 million.

#### **Annualized Cost**

The project first cost was converted to an annual basis, using a 50-year amortization period and the current applicable Federal interest rate of 6.875 percent. Accrued interest during the construction period was calculated as described in Chapter 5 and taken into account to produce a total investment cost. The annualized costs for the plans were used for computation of the BCR.



Revised: 13 August 1999

Table 6-5	1
Cost Estimate Summary for the Recommended	Plan
(October 1998 prices)	

Description	Construction	Contingency	Total
Lands and Damages	\$20,581,600	\$5,113,400	\$25,695,000
Relocations	\$4,655,400	\$1,250,200	\$5,905,600
Fish and Wildlife Facilities	\$383,900	\$96,000	\$479,900
Channels and Canals	\$24,434,300	\$5,397,700	\$29,832,000
Levees and Floodways	\$13,865,500	\$3,363,400	\$17,228,900
Recreation Facilities	\$4,139,400	\$1,247,800	\$5,387,200
Cultural Resources Preservation	\$640,000	\$160,000	\$800,000
Planning, Engineering and Design	\$10,014,900	\$1,864,900	\$11,879,800
Construction Management	\$5,460,700	\$1,365,200	\$6,825,900
Sub-Totals	\$84,175,700	\$19,858,600	\$104,034,300
Compatible Non-Federal Levees	\$23,120,000	\$0	\$23,120,000
Total Project Costs	\$107,295,700	\$19,858,600	\$127,154,300

#### **ECONOMIC SUMMARY**

Table 6-6 presents the economic summary for the combined flood control and recreation features of the Recommended Plan, while table 6-6a presents separate analyses of each of these project purposes. The outputs of the environmental restoration features are measured in non-monetary units; therefore, the costs associated with these features are not included in the economic analysis of the project. Additionally, costs for cultural resource preservation are 100 percent Federal costs, up to a limit of one percent of total Federal project costs, and are not included in the economic analysis of the project. As shown, the Recommended Plan is economically justified, with net annual benefits of \$9.8 million, and a BCR of 2.06.



Revised: 13 August 1999

Table 6-6						
Econo	mic S	ummary	of the	Reco	mmende	d Plan
October 1	998 pric	es. 6.875	% intere	est. 50-v	ear period	of analysis)

Project Costs	Financial Cost	Economic Cost
Lands and Damages	\$21,604,800	\$21,604,800
Relocation Assistance	\$4,090,200	\$0
Relocations (Utilities, etc.)	\$5,905,600	\$5,905,600
Fish and Wildlife Facilities	\$479,900	\$479,900
Construction (Flood Control)	\$42,371,400	\$42,371,400
Construction (Environmental Restoration)	\$4,689,500	\$0
Construction (Recreation)	\$5,387,200	\$5,387,200
Engineering and Design (Flood Control / Recreation)	\$11,303,700	\$11,303,700
Engineering and Design (Environmental Restoration)	\$576,100	\$0
Construction Management (Flood Control / Recreation)	\$6,452,900	\$6,452,900
Construction Management (Environmental Restoration)	\$373,000	\$0
Cultural Resources Preservation	\$800,000	\$0
Project First Cost	\$104,034,300	\$93,505,500
Interest During Construction		\$4,753,000
Non-Federal Levees	•	\$23,120,000
Total Investment		\$121,378,500
Annual Costs		
Interest and Amortization		\$8,656,300
OMRR&R		\$600,000
Total Annual Cost		\$9,256,300
Equivalent Annual Benefits		
Flood Control Benefits		\$13,285,100
Recreation Benefits		\$5,777,200
Total Equivalent Annual Benefits		\$19,062,300
Net Equivalent Benefits		\$9,806,000
Benefit-Cost Ratio		2.06

Revised: 13 August 1999

#### Table 6-6a Economic Analysis of Separate Flood Control and Recreation Purposes October 1998 prices 6.875% interest 50-year period of analy

(October 1998 prices, 6.875% interest, 50-year period of analysis)

	Flood Control	Recreation
First Costs	\$113,958,300	\$6,757,400
Economic Costs *	\$109,868,100	\$6,757,400
Interest During Construction	\$4,523,300	\$229,700
Investment Cost	\$114,391,400	\$6,987,100
Interest and Amortization	\$8,158,000	\$498,300
OMRR&R	\$527,000	\$73,000
Annual Costs	\$8,685,000	\$571,300
Annual Benefits	\$13,285,100	\$5,777,200
Net Annual Benefits	\$4,600,100	\$5,205,900
Benefit-Cost Ratio (BCR)	1.53	10.11

\* Economic costs for Flood Control do not include \$4,090,200 in Relocation Assistance costs.

#### PROJECT COST SHARING

The provisions of the Water Resources Development Act of 1986 (Public Law 99-662), approved November 17, 1986, and the Water Resources Development Act of 1996 (Public Law 104-303), approved October 12, 1996, stipulate cost sharing requirements which local sponsors must meet for the Federal Government to be involved with water resource projects. Cost sharing provisions for the flood control, environmental restoration, and recreational development purposes are outlined below. The costs of removing and/or preserving cultural resources which may be discovered during implementation of this project would be borne as a 100 percent Federal cost, up to a maximum of one percent of the total Federal project costs. Should the cost of cultural resource preservation exceed this one percent limit, cost sharing provisions would be implemented. An estimate of approximately \$800,000 has been developed to cover the possibility of cultural resource preservation. These non-sharable costs have been shown in cost apportionment table 6-8.

#### FLOOD CONTROL

The identified feasible flood control project would be cost shared based on the provisions set forth in Public Law 99-662, as amended. The designated Sponsor would be required to formally approve the recommendations of the General Reevaluation Report before initiating the Preconstruction, Engineering, and Design Phase of the project.

For structural flood control projects, the non-Federal cost is to be a minimum of 25 percent and a maximum of 50 percent of total project costs. The non-Federal sponsor is responsible for 100 percent of the operation, maintenance and replacement costs of the project.

Revised: 13 August 1999

#### ENVIRONMENTAL RESTORATION

Due to the requirement to obtain an amendment to the original 1965 authorization adding environmental restoration as a project purpose, environmental restoration will be cost shared in accordance with the provisions of Public Law 104-303 (WRDA 1996). Under this law, the non-Federal cost is to be 35 percent of the total environmental restoration project costs. The non-Federal sponsor is responsible for 100 percent of the operation, maintenance and replacement costs of the project.

#### RECREATIONAL DEVELOPMENT

Under the Federal Water Project Recreation Act of 1965 (Public Law 89-72), outdoor recreational facilities can be provided at Federal non-reservoir flood damage reduction projects. However, recreational developments must be within the lands acquired for the basic project, except for separable lands required for access, parking, potable water, sanitation and related developments for health, safety and public access. Also, the facilities for cost sharing must be accordance with the approved list in ER 1165-2-400. As stipulated in Public Law 99-662, recreational development including lands required for public access, health, and safety, are cost-shared on an equal (50/50 percent) basis between Federal and non-Federal public interests. The cost of lands provided by local interests for the basic project are not included for recreational cost sharing purposes. Operation, maintenance and replacement costs are also the responsibility of the non-Federal sponsor.

#### DIVISION OF PLAN RESPONSIBILITIES

#### COST APPORTIONMENT

Table 6-7 presents the project costs, by work item, for the Recommended Plan. Table 6-8 reflects the calculations performed to determine the Federal and non-Federal cost apportionments based on the appropriate laws and regulations, as described previously.

Table 6-9 shows the cost apportionment data for the Recommended Plan. The total cost of this plan was estimated at \$127.2 million. As shown, the Federal cost would total approximately \$83.6 million (65.7%), while the non-Federal cost would equal approximately \$43.6 million (34.3%).

The costs shown in table 6-9 are based on standard requirements set forth in Public Law 99-662, as amended, for the flood control and recreation components of the Recommended Plan. Since environmental restoration was not a project purpose under the 1965 authorization, an amendment to the original authorization adding environmental restoration as a project purpose would necessitate the application of standard cost sharing requirements for environmental restoration set forth in Public Law 104-303. Under these laws, non-Federal interests would be required to furnish all lands, easements, rights-of-way, and disposal areas, and perform all relocations of bridges and utilities. Specifically, the non-Federal share of project costs are set at a minimum of 25 percent and a maximum of 50 percent of the total flood control costs, 35 percent of the environmental restoration costs, and 50 percent of the recreation costs. Non-Federal interests would also be responsible for the operation and maintenance of the project features after construction. The Federal Government would be responsible for a minimum of 50 percent and a maximum of 75 percent of the flood damage reduction costs, 65 percent of the environmental restoration costs, and 50 percent of costs.

In addition to the cost apportionment regulations cited above, the provisions of Section 351 of WRDA 1996 regarding credit toward the non-Federal share of the project for advanced construction of the Central Wastewater Treatment Plant Levee and the "compatible" portion of the Rochester Park Levee were incorporated into the remaining costs analysis shown in table 6-9a. The non-Federal share of project costs prior to application of the levee credit was such that all of

#### Revised: 13 August 1999

the costs for the compatible non-Federal levees were applied. The only non-Federal construction not credited was the portion of Rochester Park which was incompatible with the Recommended Plan.

	PROJECT COSTS
LERRD (Non-Federal Levees)	\$946,000
RELOCATIONS /UTILITIES	+
- Flood Control	\$5,905,600
EXCAVATION / DISPOSAL	
- Flood Control	\$28,804,800
- Environmental Restoration	. \$4,101,100
FILL	
- Flood Control	\$1,893,200
OTHER CONSTRUCTION	E E
- Non-Federal Levees	\$22,174,000
- Flood Control	\$11,673,400
- Environmental Restoration	\$588,400
- Recreation	\$5,387,200
MITIGATION (W/O LAND)	
- Flood Control	\$479,900
REAL ESTATE	
- Flood Control	\$21,433,700
- Mitigation (Flood Control)	- \$4,261,300
CULTURAL RESOURCE PRESERVATION	\$800,000
ENGINEERING & DESIGN	
- Flood Control	\$10,472,000
- Environmental Restoration	\$576,100
- Recreation	\$831,700
CONSTRUCTION MANAGEMENT	
- Flood Control	\$5,914,400
- Environmental Restoration	\$373,000
- Recreation	\$538,500
TOTAL PROJECT COSTS	\$127,154,300
Flood Control Costs Only (Without Non-Federal Levees)	\$90,838,300
Non-Federal Levee Costs Deemed "Compatible"	\$23,120,000
Total Flood Control Costs	\$113 958.300

#### Table 6-7 Project Costs for the Recommended Plan (October 1998 prices)

Revised: 13 August 1999

COST	FLOOD	ENVIRONMENTAL RESTORATION	RECREATION	
FEDERAL COST			-	
Excavation/Disposal	\$28,804,800	\$4,101,100	\$0	
Fill	\$1,893,200	\$0	\$0	
Other Construction	\$11,673,400	\$588,400	\$5,387,200	
Mitigation (w/o Land)	\$479,900	\$0	\$0	
Engineering & Design	\$10,472,000	\$576,100	\$831,700	
Construction Management	\$5,914,400	\$373,000	\$538,500	
Sub-Sub-Total	\$59,237,700	\$5,638,600	\$6,757,400	
5% Cash Reduction *	(\$5,697,900)	\$0	\$0	
Additional Cash	\$0	(\$1,973,500)	(\$3,378,700)	
Sub-Total	\$53,539,800	\$3,665,100	\$3,378,700	
Non-Federal Levee Credit	\$22,174,000	\$0	\$0	
TOTAL	\$75,713,800	\$3,665,100	\$3,378,700	
Cultural Resource Preservation	\$800,000			
TOTAL FEDERAL PROJECT COSTS	\$83,557,600			
Percent		65.7%		
NON-FEDERAL COST		•		
Non-Federal Levee Construction	\$22,174,000	\$0	\$0	
LERRD (Non-Federal Levees)	\$946,000	\$0	\$0	
Relocations / Utilities	\$5,905,600	\$0	\$0	
Real Estate - Project	\$21,433,700	\$0	\$0	
Real Estate - Mitigation	\$4,261,300	\$0	\$0	
Sub-Sub-Total	\$54,720,600	\$0	\$0	
5% Cash Contribution *	\$5,697,900	\$0	\$0	
Additional Cash	\$0	\$1,973,500	\$3,378,700	
Sub-Total	\$60,418,500	\$1,973,500	\$3,378,700	
Non-Federal Levee Credit	(\$22,174,000)	\$0	\$0	
TOTAL	\$38,244,500	\$1,973,500	\$3,378,700	
TOTAL NON-FEDERAL PROJECT COSTS	· · · · · · · · · · · · · · · · · ·	\$43,596,700		
Percent	34.3%			
TOTAL PROJECT COSTS	\$127,154,300			

## Table 6-8 Cost Apportionment Calculations for the Recommended Plan (October 1998 prices)

\* 5% Cash Contribution applied against flood control costs of \$113,958,300 Revised: 13 August 1999

#### Table 6-9 Cost Apportionment Data for the Recommended Plan (October 1998 prices)

Percentage	65.7	34.3	100
TOTAL	\$83,557,600	\$43,596,700	\$127,154,300
Additional Federal Cost - Cultural Resource Preservation	\$800,000	\$0	\$800,000
Recreation	\$3,378,700	\$3,378,700	\$6,757,400
Environmental Restoration	\$3,665,100	\$1,973,500	\$5,638,600
Flood Damage Reduction	\$75,713,800	\$38,244,500	\$113,958,300
Purpose	Federal Cost	Non-Federal Cost	Total Gost

Table 6-9A Remaining Federal / Non-Federal Costs for the Recommended Plan (October 1998 prices)

Purpose	Faderal Cosi	Non-Federal Cost	(GUI) Cost
Cost Apportionment	\$83,557,600	\$43,596,700	\$127,154,300
Previously Expended	\$0	\$23,120,000	\$23,120,000
Remaining Costs	\$83,557,600	\$20,476,700	\$104,034,300

#### NON-FEDERAL RESPONSIBILITIES

Prior to commencement of construction, local interests must agree to meet the requirements for non-Federal responsibilities as outlined below and in future legal documents.

- a. Provide between 25 percent and 50 percent of the separable project costs allocated to flood control, 35 percent of the separable project costs allocated to environmental restoration, and 50 percent of the costs separable project costs allocated to recreation, as further specified below:
  - Provide, during construction, funds needed to cover the non-Federal share of preconstruction engineering and design costs;
  - Provide, during construction, a cash contribution equal to 5 percent of total project costs allocable to flood control;
  - (3) Provide all lands, easements, and rights-of-way, including suitable borrow and dredged or excavated material disposal areas, and perform or assure the performance of all relocations determined by the Government to be necessary for the construction, operation, and maintenance of the project;
  - (4) Provide or pay to the Government the cost of providing all retaining dikes, wasteweirs, bulkheads, and embankments, including all monitoring features and stilling basins, that may be required at any dredged or excavated material disposal areas required for the construction, operation, and maintenance of the project; and

Revised: 13 August 1999

- (5) Provide, during construction, any additional costs as necessary to make its total contribution equal to 25 percent of total project costs allocated to structural flood control, 35 percent of the separable project costs allocated to environmental restoration, and 50 percent of the costs separable project costs allocated to recreation.
- b. Grant the Government a right to enter, at reasonable times and in a reasonable manner, upon land which the local sponsor owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the project.
- c. Assume responsibility for operating, maintaining, replacing, repairing, and rehabilitating (OMRR&R) the project or completed functional portions of the project including mitigation features, without cost to the Government, in a manner compatible with the project's authorized purposes, and in accordance with applicable Federal and State laws and specific directions prescribed by the Government in the OMRR&R manual and any subsequent amendments.
- d. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended, and Section 103 of the Water Resources Development Act of 1986, Public Law 99-662, as amended, which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until the non-Federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element.
- e. Hold and save the Government free from all damages arising for the construction, operation, maintenance, repair, replacement, and rehabilitation of the project and any project-related betterments, except for damages due to the fault or negligence of the Government or the Government's contractors.
- Keep and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project to the extent and in such detail as will properly reflect total project costs.
- g. Perform, or cause to be performed, 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), 42 U.S.C. 9601-9675, that may exist in, on, or under lands, easements or rights-of-way necessary for the construction, operation, and maintenance of the project; except that the non-Federal sponsor shall not perform such investigations on lands, easements, or rights-of-way that the Government determines to be subject to the navigation servitude without prior specific written direction by the Government.
- h. Assume complete financial responsibility for all necessary cleanup and response costs of any CERCLA regulated materials located in, on, or under lands, easements, or rights-ofway that the Government determines necessary for the construction, operation, or maintenance of the project.
- i. To the maximum extent practicable, operate, maintain, repair, replace, and rehabilitate the project in a manner that will not cause liability to arise under CERCLA.
- Prevent future encroachments on project lands, easements, and rights-of-way which might interfere with the proper functioning of the project.
- k. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public law 91-646, as amended by title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 CFR part 24, in acquiring lands, easements, and rights-of-way, and performing relocations for construction, operation, and maintenance of the project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said act.

Revised: 13 August 1999

Conducted by the Department of the Army," and Section 402 of the Water Resources Development Act of 1986, as amended.

- m. Provide the non-Federal share of that portion of total cultural resource preservation mitigation and data recovery costs attributable to flood control, environmental restoration, and recreation that are in excess of one percent of the total amount authorized to be appropriated for flood control, environmental restoration, and recreation.
- n. Participate in applicable flood insurance programs, and in accordance with Section 202(c) of the Water Resources Development Act of 1996, within 1 year after the date of signing a project cooperation agreement for construction of the project, prepare a floodplain management plan designed to reduce the impacts of future flood events in the project area, and implement such plan no later than 1 year after completion of construction of the project.
- Provide and maintain necessary access roads, parking areas and other public use facilities, open and available to all on equal terms.
- p. Prescribe and enforce regulations to prevent obstruction of or encroachment on the Project that would reduce the level of protection it affords or that would hinder operation or maintenance of the Project.
- q. Not use Federal funds to meet the non-Federal sponsor's share of total project costs unless the Federal granting agency verifies in writing that the expenditure of such funds is expressly authorized by statute.

#### PUBLIC INVOLVEMENT

This section briefly summarizes the results of public involvement activities undertaken as part of these General Reevaluation Report level investigations.

#### PURPOSE OF PROGRAM

This study focused on the development of an economically feasible, environmentally acceptable, and publicly supported solution to the flooding problems with the Dallas Floodway Extension area. Numerous meetings and conversations have been held with the various entities and interested citizens to share the latest possible information and to focus this study toward investigating the most viable alternatives. In addition, various public workshops/meetings were held in the study area for the citizens to give input into the problems and possible solutions, as stipulated by Public Law 99-662 and Public Law 104-303.

#### PARTICIPANTS

Study participants worked closely over a six-year period in an effort to inform and involve the concerned citizens in the study area. The agencies involved in this effort included the Fort Worth District (Corps of Engineers), City of Dallas, Texas Parks and Wildlife Department (TPWD), United States Fish and Wildlife Service (USFWS), and Texas Department of Transportation (TxDOT). The staff and representatives of these agencies have worked tirelessly to answer citizens questions and concerns, by hosting a series of workshops or information meetings.

#### PUBLIC WORKSHOPS

On May 21, 1991, an Environmental Impact Statement Scoping meeting was held in Dallas (Roosevelt High School). The purpose of this meeting was to inform the public of the proposal for work along the Dallas Floodway Extension and to solicil comments and information from the public to assist the Corps of Engineers in the preparation of a proposed solution to the problems within the area. Public attendance was poor.

During 1993 and 1994, the Dallas Floodway Extension Advisory Committee held numerous meetings concerning the potential solutions for the Dallas Floodway Extension flooding problems. At these meetings, Corps of Engineers representatives briefed the advisory committee on progress of the investigations and answered questions concerning the project.

Starting in the Summer of 1994 through the Spring of 1996, numerous meetings of the Trinity River Corridor Citizens Committee (TRCCC) were held to gather citizen input as to problems and solutions in the Trinity River Corridor within the city of Dallas. The areas discussed during these meetings included: environmental issues, flood damage reduction, recreation, economic development, and transportation. These meetings were attended by representatives of the city of Dallas and Corps of Engineers to provide technical input to the various groups within the TRCCC. Approximately 400 citizens participated in these meetings, and were from all areas of the city of Dallas (i.e. neighborhoods, business, environmental interests). The TRCCC produced a document expressing their desires for efforts within the Trinity River. A final report was prepared and published in May 1996 presenting their recommendations.

On June 18, 1996, the Corps of Engineers made a presentation to the Greater Dallas Planning Council concerning the on-going Corps of Engineers efforts in the Trinity River corridor within the city of Dallas. The topics of discussion were the Dallas Floodway Extension and the Upper Trinity River Feasibility Study.

On June 29, 1996, an Environmental and Recreation Assistance Committee (ENRAC) meeting was held at Reunion Tower in the city of Dallas, to present the status of on-going studies/projects within the Trinity River Basin (Fort Worth District). These projects included a detailed discussion of the Dallas Floodway Extension project. At this meeting, questions were addressed or noted and addressed in writing to the attendees.

On July 29, 1996, The Fort Worth District made a presentation to the Trinity River Corridor Citizens Committee concerning the Dallas Floodway Extension project status and proposals. This presentation and resulting questions were addressed by Colonel Peter Madsen. According to the City of Dallas, the meeting was attended by 115 people.

On August 13, 1996, The Fort Worth District made a presentation to the Trinity River Corridor Citizens Committee concerning questions raised at the July 29 meeting on the Dallas Floodway Extension project. This presentation and resulting questions were addressed by Colonel Peter Madsen. According to the City of Dallas, the meeting was attended by 135 people. Follow-on questions were answered and distributed later in the month.

On August 21, 1996, the Dallas City Council was briefed on the proposed Chain of Wetlands -Plan as the Locally Preferred Plan. Several citizens addressed the City Council on the issue. On August 28, 1996, the Dallas City Council voted unanimously to adopt the Chain of Wetlands as the Locally Preferred Plan, with the stipulation to look at adding levees to the plan.

On August 22, 1996, Mayor Ron Kirk (Dallas) asked the representatives of various state and Federal agencies to meet and work together in the pursuit of improvements within the Trinity River corridor. These agencies included: City of Dallas, U.S. Army Corps of Engineers, Texas Department of Transportation, Environmental Protection Agency, Texas Parks and Wildlife Department, Texas Natural Resource Conservation Commission, Texas Tumpike Authority, Dallas County and the Assistant Secretary of the Army for Civil Works. This group agreed to cooperate and coordinate their efforts.

On November 16, 1996, an Environmental and Recreation Assistance Committee (ENRAC) meeting was held at Roosevelt High School in the city of Dallas, to present the status of on-going studies/projects within the Trinity River Basin (Fort Worth District). These projects included a detailed discussion of the Dallas Floodway Extension project. At this meeting, questions were addressed or noted and addressed in writing to the attendees.

On December 10, 1996, a Public Scoping meeting for the Dallas Floodway Extension Environmental Impact Statement (EIS) was held in Dallas, Texas. The purpose of this meeting was to solicit comments on the proposed project. This meeting was attended by 96 people. Comments received were addressed/incorporated into the EIS.

On February 8, 1997, a workshop was held at the Sleepy Hollow Golf Course Club House. This meeting was organized by the city of Dallas to provide information on the engineering analysis and evaluation of alternatives for the modified Chain of Wetlands and potential levees to affected property owners, neighborhood representatives, and key environmental group representatives. According to the City of Dallas, this workshop was attended by approximately 65 people.

On February 11, 1997, The Fort Worth District made a presentation to the Trinity River Comdor Citizens Committee concerning the Dallas Floodway Extension project status and proposals. This presentation and resulting questions were addressed by Colonel Peter Madsen and was attended by more than 250 people. Follow-on questions were answered and distributed later in the month.

On February 27, 1997, a neighborhood meeting was held at the Martin Luther King Seniors Center in South Dallas. This meeting was organized to inform the residents of the Lamar Street & Rochester Park areas of the proposed project for flood damage reduction in the area. The City of Dallas (City Council members and staff) and Corps of Engineers representatives made presentations and answered questions by the public, numbering 100 in attendance, according to the City of Dallas.

On March 4, 1997, a neighborhood meeting was held for the Cadillac Heights and Joppa neighborhoods. According to the City of Dallas, the meeting was attended by about 70 residents, and representatives from the City of Dallas (Council members and staff) and the Corps of Engineers. This meeting was used to inform the citizens of the proposed project and solicit their comments.

On March 19, 1997, the Dallas City Council was briefed on the proposal to add the Lamar Street and Cadillac Heights levees to the Locally Preferred Plan. Several citizens addressed the City Council on the issue. Then on March 26, 1997, the Dallas City Council voted unanimously to add the Lamar Street and Cadillac Heights levees to the Locally Preferred Plan.

On August 9, 1997, a presentation was made and questions were answered concerning the Locally Preferred Plan for the Dallas Floodway Extension. This seminar was held at the Sleepy Hollow Country Club in Dallas, Texas. This seminar was put on by the American Institute of Architects and entitled "A River Runs Through Us". This seminar was designed for educators (First Grade through Twelfth Grade) and had presentations by various agencies involved in projects within the Trinity River in Dallas. Agencies represented included: Office of State Archeologist, Environmental Protection Agency, City of Dallas, Texas Department of Transportation, and U.S. Army Corps of Engineers. Approximately 50 educators were present at this seminar.

Starting in the Fall 1996 and continuing through the present, meetings of the Interagency Executive Team (IET) are held in Dallas. This IET is made up of representatives of various agencies (State and Federal) who had jurisdiction or on-going work within the Trinity River Corridor. These agencies include: City of Dallas, U.S. Army Corps of Engineers, Texas Department of Transportation, Environmental Protection Agency, Texas Parks and Wildlife Department, Texas Natural Resource Conservation Commission, North Texas Tollway Authority, Dallas County and the North Central Texas Council of Governments. This group acts as a coordinating team between all agencies to optimize the efforts within the river corridor.

On August 21, 1997, Mayor Ron Kirk (Dallas) asked the representatives of various state and Federal agencies to again meet and discuss the advancements that had been made during the previous year since the last summit. These agencies included: City of Dallas, U.S. Army Corps of Engineers, Texas Department of Transportation, Office of the Secretary of the Army, Dallas County, Environmental Protection Agency, Texas Parks and Wildlife Department, Texas Natural Resource Conservation Commission, Texas Turnpike Authority, and North Central Texas Council of Governments.

During the life of the General Reevaluation Report/Environmental Impact Statement (GRR/EIS) preparation (1991 through 1998), numerous meetings with concerned individuals, groups, and affected property owners have been held to answer their questions and receive their feed back. Additionally, numerous letters and other correspondence have been transmitted to organizations and individuals to answer their questions and receive their feed back on the proposed project.

Upon completion of the draft GRR, a public meeting was held on June 9, 1998, to present the findings contained in the report and to receive public comments. The formal public review period ended on August 14, 1998. The comments received during this review period have been compiled, with appropriate responses, and included in this report in Appendix N.

#### FINANCIAL ANALYSIS

#### SOCIO-ECONOMIC EFFECTS OF PLAN IMPLEMENTATION

The potential economic and social effects of implementation of the investigated plan on the study area comprise the value of the long-term reduction in periodic flood damages, and direct and indirect short-term income and employment impact of project construction. The permanent reduction in periodic flood damages would effectively increase the income available to flood plain property owners for other purposes, such as (for example) improvements to homes, yards or personal property. Construction of SPF levees could encourage growth of existing business and entice new business to the area. This would improve employment conditions and expand the tax base of the area.

To the extent that this additional disposable income is spent within the surrounding area, it would result in a local "multiplier effect": increases in business revenues, employment, and personal income rippling through the local economy as each new dollar brought in is spent and respent. Property values, and local tax revenues, would also be expected to increase as a general result.

Short-term impacts associated with project construction results from the temporary presence of construction workers and expenditures for construction materials and services, as well as spending by the construction work force for food and other personal needs. These expenditures would be expected to result in a positive multiplier effect on the local economy and would last for about three years. The lasting economic and social effects of project implementation would be the benefits resulting from the permanent reduction in flood damages, as described above.

#### **FINANCIAL CAPABILITY**

A financial capability analysis of the City of Dallas was conducted in accordance with ER 1105-2-100 to ascertain the community's financial condition and its ability to meet the cost sharing responsibilities for the Floodway Extension Project. The assessment involved the calculation and analysis of nine key financial indicators. A number of interrelated economic, fiscal, and management factors support a local government's capacity to finance desired capital improvement projects. Those factors include the health of the local economy, the structure of its revenue base, the management of the community's operations, and the debt history of the community.

The Municipal Fiscal Officers Association has developed a number of financial warning indicators useful in determining the financial health of a community. These indicators are used to help determine the sponsor's current debt position and financial health. Financial indicator ratings are calculated for the city of Dallas and are compared to national averages as outlined in the Environmental Protection Agency's *Financial Capability Guidebook*, dated March 1984. The financial data used to calculate these ratings were obtained from the city of Dallas Office of Budget and Management. Other relevant facts and data which play a role in the analysis include population, per capita income and property tax information. Table 6-10 shows the indicator values and rating for the city of Dallas. The indicators, calculated values and corresponding rating have been updated to reflect the city's capability as of September 1997 and are summarized in table 6-11.

	Indicator	Value	Rating
1.	Annual rate of change in population	1.2%	Strong
2.	Current surplus/deficit as a percent of total current expenditures	1.1%	Average
3.	Real property tax collection rate	96.9%	Average
4.	Property tax revenues as a percent of full market value of real property	0.5%	Strong
5.	Overall net debt as a percent of full market value of real property	2.2%	Strong
6.	Overall net debt outstanding as a percent of personal income	5.2%	Average
7.	Direct net debt per capita	\$609	Average
8.	Overall net debt per capita	\$1,267	Weak
9.	Percent direct net debt outstanding due within next 5 years	77.0%	Strong

#### Table 6-10 Current Community Financial Indicator Values For The City Of Dallas

The annual rate of change in Dallas' population between 1980 and 1997 exhibits a strong 1.2 percent annual rate of change. The indicator stability in the economic base is useful because the economic base typically rises and falls with changes in the population. The proportion of surplus/deficit expenditures to total expenditures are also some significant indicators of the community's strength. Dallas is currently operating at a surplus with revenues exceeding expenditures by about 1.1 percent, which is in balance with the national average. The third indicator measures the efficiency of the city's tax collection system. The city is currently average in this area reporting a 1997 collection rate of 96.9 percent. The city's reliance on tax revenue, indicator four, shows the extensiveness of property taxation and the potential for future revenue growth from this source. A value of 0.5 percent is strong and indicates that the city does not appear to tax heavily in relation to property values in this area.

Indicators' five through nine are used to assess the community's debt capacity. Indicator five compares the amount of tax-supported debt to the full market value of real property. The city of Dallas is average with a value of 2.2 percent. Personal income can be used as a yardstick to judge the city's ability to repay debt. Per Capita income for January 1994 was \$24,480. Indicator six shows net debt representing about 5.2 percent of total personal income, which is average for most cities. Indicators' seven and eight represent the per capita direct debt of almost \$609 and overall net debt outstanding per capita of \$1,267, which indicates a weakness in this area.

Finally, indicator nine compares the percentage of direct net debt due within five years to total outstanding direct net debt. The city's situation is strong with 77 percent of the outstanding debt being paid over the next five years. The overall net debt reported in 1997 was \$1,326,830,670.

Based on the national averages the overall financial condition of the city of Dallas is currently in a healthy state. The only indicator falling within the weak range was for the amount of net debt outstanding per capita. However, the calculated value only exceeded the average limits by only \$67. Based on this analysis, the city of Dallas appears to have room to expand their debt load to accommodate new capital projects.



# Table 6-11Summary of Financial CapabilityDallas Floodway Extension Dallas, Texas, General Evaluation

A.	BOND RATINGS	Rating	Date		
	General Obligation	AAA/Aaa (S&P)	Nov-96		×
	Revenue Bonds:		·		*
	<b>Dallas Water Utilities</b>	AA/Aa (S&P)			· .
	Civic Center	A/A1	Apr-98		
В.	DEBT				
		Outstanding	Projected		Total
G	Seneral Obligation Bonds	\$632,940,270		0	\$632,940,270
R	evenue Bonds	\$1,026,993,000		0	\$1,026,993,000
G	Fross Direct Debt	\$1,659,933,270		0	\$1,659,933,270
D	irect Net Debt	\$632,940,270		0	\$632,940,270
C	overlapping Net Debt 1/	\$693,890,000		0	\$693,890,000
С	verall Net Debt	\$1,326,830,270		0	\$1,326,830,270

#### C. DEBT REPAYMENT SCHEDULE (principal only)

	Existing	This Project*	Total
Year 1: 1998	\$110,829,408	0	\$110,829,408
Year 2: 1999	\$107,821,082	0	\$107,821,082
Year 3: 2000	\$100,014,486	0	\$100,014,486
Year 4: 2001	\$86,486,881	0	\$86,486,881
Year 5: 2002	\$80,955,880	0	\$80,955,880
		•	\$486,107.737

\* Assumes project funding at \$23.7 million and included in outstanding debts. General Obligation bonds authorized as of May 1997.

#### **D. DEBT LIMITS**

Constitutional and Charter Debt Limit: Ten percent of assessed value. Article 717K, Vemon's Annotated Texas Civil Status Constitution and Laws of the State of Texas. Approximately 16.83% of debt limit will be used.

<sup>1</sup> Overlapping net debt is the sponsor's share of taxes owed to other taxing bodies within the community, ie., a flood district.

<sup>2</sup> Other debt obligations include outstanding leases, unfunded pension liabilities, and notes with a maturity.

#### NON-FEDERAL FINANCIAL PLANNING

The purpose of strategic financial planning is to optimize the use of capital over time in response to long term financial goals. The three principal elements involved include cost recovery alternatives, if needed; selection of the preferred financing alternative; and implementation of the cost recovery approach. Although financing decisions are ultimately the sponsors', the Corps of Engineers can assist in the decision making through the provision of timely information on costs, benefits and cost recovery opportunities. The sponsor is responsible for making arrangements to finance the project sufficiently in advance of construction to enable the project schedule to be met.

#### ABILITY-TO PAY ANALYSIS

Based on ER 1165-2-121 an ability-to-pay test should be applied to all flood control projects. The test determines the eligibility of the study area to qualify for a reduction in the amount to be cost shared by the Non-Federal interest. To qualify for a reduction the results of both the benefit and income portions of the twofold ability-to-pay test must fall within the specified guidelines.

The benefits' test determines the maximum reduction, called the "benefits based floor" (BBF), in the level of non-Federal cost sharing for any project. The factor is determined by dividing the project B/C ratio by four. If the factor (expressed as a percentage) is less than the standard level of cost sharing, the project may be eligible for a reduction in the non-Federal share to this BBF. The standard level cost share for the Flood Protection project is a minimum of 25 percent. The recommended plan's B/C ratio of 2.06 was divided by four to yield a BBF of .515 or 51.5 percent.

The income test determines qualification for the reduction calculated in the benefit step. Qualification depends on a measure of the current economic resources of both the project area and the State in which the project is located.

In accordance with factors released in Economic Guidance 96-4, the income index factors for the state of Texas and Dallas County are 90.81 and 102.77, respectively. The Eligibility Factor (EF) for a flood control project is calculated according to the following formula:

 $EF = a - b_1 * (State factor) - b_2 * (area factor)$ 

where:

a = 15.86794 $b_1 = 0.06771$  $b_2 = 0.13543$ 

Utilizing the above formula, an EF of -4.2 was calculated for the City of Dallas. An EF less than zero indicates ineligibility for a reduction in construction cost sharing. As stated previously, a BBF factor for the investigated plan was calculated at 51.5 percent. To qualify for a reduction, the BBF factor must be less than the standard level of cost sharing. According to ER-1165-2-121 paragraph 5a(2), the City of Dallas does not meet the criteria for a reduction in construction cost because this project does not meet both of the tests; therefore, the City of Dallas must pay a minimum of 25 percent level of the total flood protection project cost.

