

AD-A087 602

ARMY ENGINEER DISTRICT FORT WORTH TEX
ENVIRONMENTAL STATEMENT FOR LAVON DAM AND RESERVOIR MODIFICATIO--ETC(U)
1977

F/G 13/2

UNCLASSIFIED

NL

1 of 3

AD-A087 602



ADA 087602

DISCLAIMER NOTICE

**THIS DOCUMENT IS BEST QUALITY
PRACTICABLE. THE COPY FURNISHED
TO DTIC CONTAINED A SIGNIFICANT
NUMBER OF PAGES WHICH DO NOT
REPRODUCE LEGIBLY.**

AUTHORIZED
LAVON MODIFICATION AND EAST FORK CHANNEL
SUMMARY OF ECONOMIC DATA
(October 1977 prices, 3-1/8% interest rate)

First costs	\$66,579,000
Average annual charges	2,883,800
Average annual benefits	4,024,900
Flood control	(\$ 236,800)
Recreation	(1,768,300)
Water supply	(2,019,800)
Benefit-cost ratio	1.40

INCREMENT I OF THE EAST FORK CHANNEL AND
LEVEE IMPROVEMENT PORTION OF THE AUTHORIZED
LAVON MODIFICATION AND EAST FORK CHANNEL

SUMMARY OF ECONOMIC DATA 1/
(October 1977 prices, 3-1/8% interest rate)

First costs	\$11,370,000
Average annual charges	434,200
Average annual benefits	236,800
Flood control	(\$236,800)
Benefit-cost ratio	0.55

1/ A reevaluation of the economic aspects of the project completed fall 1977. These data served as basis for developing current estimates of the project costs and benefits and are on file in Fort Worth District.

Unclas

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
	AD-A087602	(9) Final rept.
4. TITLE (and Subtitle) Final Supplement to Environmental Statement for Lavon Dam & Reservoir Modification and East Fork Channel Improvement - Pertaining to East Fork Channel and Levee Improvement Increment		5. TYPE OF REPORT & PERIOD COVERED Final Supplement to Environmental Statement
7. AUTHOR(s) US Army Corps of Engineers Ft Worth, TX		6. PERFORMING ORG. REPORT NUMBER
		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Corps of Engineers Ft Worth, TX		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
		(11) 1977
11. CONTROLLING OFFICE NAME AND ADDRESS Fort Worth District, Corps of Engineers Engineering Division, Plng Br, SWFED-P PO Box 17300, Ft. Worth, TX 76102		12. REPORT DATE
		13. NUMBER OF PAGES 176
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) NA		15. SECURITY CLASS. (of this report) Unclas
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Environmental Impact Statement Trinity River, Texas Channel Improvement Levee Improvement Lavon Dam & Reservoir East Fork		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Enlargement of Lavon Reservoir on the East Fork of the Trinity River for water supply and recreation, together with channel works and improvements to levees and drainage structures downstream from Forney Dam Site.		

PREFACE

The River and Harbor Act of 1962 (Public Law 87-874) authorized, substantially in accordance with the recommendations of the Chief of Engineers contained in House Document Numbered 554 (Eighty-seventh Congress), the project for flood protection on the East Fork of the Trinity River, Texas.

In the letter dated 29 June 1962, the Chief of Engineers reported to the Secretary of the Army that he generally concurred with the Board of Engineers for Rivers and Harbors which had concurred in the views and recommendations of the District and Division Engineers. The Fort Worth District Engineer and the Southwestern Division Engineer recommended "... enlargement of Lavon Reservoir on the East Fork of the Trinity River for water supply and recreation, together with channel works and improvements to levees and drainage structures downstream from Forney Dam Site . . ."

In their 1962 review of the project the Board of Engineers for Rivers and Harbors found "... that channel improvement and raising and strengthening of levees together with replacement of culverts through the levees are each independently justified." They found that channel improvements would yield a benefit-cost ratio of 1.1, and the levee and culvert improvements would yield a benefit-cost ratio of 2.4.

Since the channel and levee improvement portion of the project was authorized as a local flood protection project, local interests were required to:

- a. Furnish without cost to the United States all lands, easements, rights-of-way, and excavation disposal areas necessary for construction of the projects;
- b. Hold and save the United States free from damages due to the construction works;
- c. Bear the expense of relocating and altering highways, highway bridges (except underpinning), utilities, buildings, interior drainage facilities, pipelines, and other structures (except railroad bridges and approaches);
- d. Prescribe and enforce regulations satisfactory to the Secretary of the Army to prevent encroachment on the improved channels and floodways; and
- e. Maintain and operate all the works after completion in accordance with regulations prescribed by the Secretary of the Army.

When only two of the six local sponsors were willing to furnish assurances that the five previously stated conditions would be met,

the channel and levee improvement portion of the project was divided into two increments. Both increments were determined to be economically viable as separate projects; i.e., the benefit-cost ratio exceeded 1.0. Local assurances were provided for construction of Increment I. Increment II was placed (and currently is) in abeyance and will not be constructed in the foreseeable future.

Kaufman County Levee Improvement District Number 4 (now called Kaufman County Municipal Utilities District Number 1) and Kaufman County Levee Improvement District Number 5 provided the necessary assurances to go forward with Increment I of the project. Since then the two districts providing assurances on Increment I have obtained the necessary lands and rights-of-way and made the required relocations and alterations.

- * In response to public comments made at the 23 February 1977 public meeting on the Section 404 aspects of Public Law 92-500, the economics of the Increment I portion of the project were reviewed. Utilizing new economic criteria and field data, the Increment I portion of the project was found to have a benefit-cost ratio of 0.55. The local sponsors have fulfilled their project commitments. In spite of a cost-benefit ratio of less than 1.0, Congress expressed its desire that the project continue by appropriating additional construction funds for Fiscal Year 1979. The overall Lavon Reservoir Enlargement and East Fork Channel and Levee Improvement project as authorized (including Increment I and excluding Increment II) remains economically viable, i.e., has a benefit-cost ratio of 1.4.
- * A revised cost analysis of Increment II has not been performed, but will be if local assurances are ever provided for the project. In addition, a complete environmental analysis of Increment II will be undertaken and provisions made to compensate for fish and wildlife losses resulting from the Increment II project.

The final environmental statement for Lavon Dam and Reservoir Modification and East Fork Channel Improvement (covering the authorized project) was filed with the President's Council on Environmental Quality (CEQ) on 29 March 1971 and is now considered inadequate by current standards.

An updated environmental statement on the Lavon Dam and Reservoir portion of the project was filed with CEQ on 23 July 1976.

This supplemental statement updates information on the environmental statement relative to the Increment I portion of the East Fork Channel and Levee Improvement part of the authorized project.

SUMMARY

INCREMENT I - CHANNEL AND LEVEE IMPROVEMENT EAST FORK TRINITY RIVER, KAUFMAN COUNTY, TEXAS

() Draft Supplement to Environmental Statement

(X) Final Supplement to Environmental Statement

Responsible Office: US Army Engineer District, Fort Worth, Texas
Colonel John F. Wall
PO Box 17300
Fort Worth, Texas 76102
Telephone: 817 334-2301

1. Name of Action: (X) Administrative () Legislative

2. Description of Action: Improve channel and utilize excavated material to raise and strengthen associated levees to protect agricultural lands in the lower East Fork watershed from flooding.

3. a. Environmental Impacts: There will be reduced flooding in the flood plain near the improved channel by 50 percent or more. Improved levees will provide protection to the leveed area for floods up to magnitude of a 50-year flood. Channel improvement will reduce water travel time by about one-half hour. Short term degradation of stream water quality is expected. Ground water levels near the stream will be locally lowered. Air quality will be temporarily degraded. Thirty-seven acres of bottomland woodland will be cleared, and associated wildlife will be displaced. The loss of aquatic areas will be somewhat replaced by oxbow cutoffs with higher quality water. No endangered species will be impacted. Vector habitat will be reduced. Agricultural production will be improved. Employment will be temporarily boosted. The economy of the area will be permanently improved. Cultural elements will not be affected.

* b. Adverse Impacts: Noise, air, water, and esthetic quality will be adversely affected during construction. Esthetic quality will be more permanently altered, but erosion and sediment control measures will prevent drastic impacts. The loss of 37 acres of woodland will displace associated wildlife. Excavation and related channel work will result in long term or permanent alteration of the existing aquatic habitat.

4. Alternatives: No action, flood plain regulation, flood warning system, flood plain purchase and relocation, reservoirs, channel construction only, levee construction, levee-channel combination.

5. Comments Requested:

US Department of Agriculture
 US Department of Transportation
 US Department of the Interior
 US Department of Commerce
 US Department of Health, Education, and Welfare
 US Department of Housing and Urban Development
 US Department of Energy
 Environmental Protection Agency
 Advisory Council on Historic Preservation
 Federal Energy Regulatory Commission
 Office of the Governor, State of Texas
 Trinity River Authority
 Texas Historical Commission
 Texas Archeological Survey
 North Central Texas Council of Governments
 Kaufman County Judge
 Kaufman County Municipal Utilities District No. 1
 Kaufman County Levee Improvement District No. 5
 Kaufman County Library
 Sierra Club - Lone Star Chapter
 League of Women Voters of Texas
 Save Open Space
 The Nature Conservancy
 National Wildlife Federation
 Wildlife Management Institute
 National Audubon Society
 Sportsmen Clubs of Texas
 Izaak Walton League of America, Inc.
 Texas Committee on Natural Resources
 Wildlife Society

6. Final Statement to CEQ 29 March 1971
 Draft Supplemental Statement to EPA 24 February 1978
 * Final Supplemental Statement to EPA 10 October 1978

Accession For	
US GSA	
TAB	
mon. ed	
ification	
tribution/	
availability codes	
Available for special	
	23
	A

FINAL
SUPPLEMENT TO
ENVIRONMENTAL STATEMENT

EAST FORK CHANNEL AND LEVEE IMPROVEMENT
INCREMENT I

TABLE OF CONTENTS

	<u>Page</u>
SECTION I - PROJECT DESCRIPTION	
1.01 Project Authorization	I-1
1.02 Authorized East Fork Project	I-1
1.03 East Fork Project History	I-1
1.04 Nature of the Proposed Action	I-1
1.07 Project Benefit-to-Cost Ratio	I-2
SECTION II - ENVIRONMENTAL SETTING WITHOUT THE PROJECT	
PHYSICAL SETTING	
2.01 Physiography	II-1
2.02 Geology	II-1
2.03 Soils	II-2
2.05 Climate	II-2
2.06 River Characteristics	II-2
2.07 Point and Nonpoint Discharges	II-2
2.08 Water Quality	II-2
2.09 Ground Water Resources	II-2
2.10 Ambient Air Quality	II-3
2.11 Ambient Noise Levels	II-3
BIOLOGICAL SETTING	
2.12 Terrestrial Habitats and Vegetation	II-3
2.14 Wetlands	II-3
2.15 Wildlife	II-3
2.16 Aquatic Habitat	II-3
2.17 Fish	II-4
2.18 Vectors	II-4
2.19 Endangered Species	II-4
SOCIAL AND ECONOMIC SETTING	
2.20 Land Use	II-4
2.24 Esthetics	II-4
2.25 Recreation	II-4
2.26 Historical Background	II-4
2.27 Archeology	II-5
FUTURE ENVIRONMENTAL SETTING WITHOUT THE PROJECT	II-5
SECTION III - RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS	
	III-1

TABLE OF CONTENTS (continued)

	<u>Page</u>
SECTION IV - THE PROBABLE IMPACT OF THE PROPOSED ACTION ON THE ENVIRONMENT	
PHYSICAL IMPACTS	
4.01 Effects on Flood Frequency and Duration	IV-1
4.02 Effects of Lowered Channel Level	IV-1
4.03 Impacts on Water Quality	IV-1
4.06 Long Term Impacts	IV-2
4.08 Effect on Ground Water	IV-3
4.11 Effect on Air Quality	IV-3
4.12 Effect on Noise Levels	IV-4
ECOLOGICAL IMPACTS	
4.14 Effect on Terrestrial Habitat and Wildlife	IV-4
4.17 Effect on Aquatic Habitat	IV-5
4.21 Effect on Threatened and Endangered Species	IV-5
4.23 Effect on Vectors	IV-6
SOCIOECONOMIC IMPACTS	
4.24 Impacts on Land Use	IV-6
4.26 Effect on Loss of Agricultural Production	IV-7
4.27 Effect on Employment	IV-7
4.28 Effect on Public Services and Transportation Facilities	IV-7
4.29 Effect on Esthetic Characteristics	IV-7
4.30 Effect on Recreation	IV-8
4.31 Effect on Cultural and Archeological Resources	IV-8
SECTION V - ANY PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED	
5.01 Unavoidable Short Term Impacts	V-1
5.06 Unavoidable Long Term Impacts	V-2
SECTION VI - ALTERNATIVES TO THE PROPOSED ACTION	
6.01 General	VI-1
NONSTRUCTURAL ALTERNATIVES	
6.02 No Action	VI-1
6.03 Flood Plain Regulation	VI-1
6.04 Flood Warning System	VI-1
6.05 Flood Plain Purchase and Relocation	VI-1
STRUCTURAL ALTERNATIVES	
6.06 Reservoirs	VI-3
6.07 Channel Construction Only	VI-3
6.09 Levee Modification	VI-3
6.12 Levee-Channel Combination	VI-4

TABLE OF CONTENTS (continued)

	<u>Page</u>
SECTION VII - THE RELATIONSHIP BETWEEN LOCAL SHORT TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG TERM PRODUCTIVITY	VII-1
SECTION VIII - ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED	VIII-1
SECTION IX - COORDINATION, COMMENT, AND RESPONSE	IX-1
Bibliography	Bi-1

LIST OF TABLES

Table

VI-1	Summary of Effects Associated with Each Alternative	VI-2
IX-1	Comment and Response	IX-2

LIST OF FIGURES

Figure

1	Photomosaic of Increment I Project Area	I-3
2	Current Status of Project Work and Plan	I-4
3	Relationship Between Existing and Proposed Channel, Levee, and Water Level, Increment I	I-5
4	Relationship of Ground Water Table Elevation (1967 Borings) to Proposed Channel Grade and Existing Ground Level	I-6

APPENDIX A-I

EAST FORK ENVIRONMENTAL SETTING

PHYSICAL SETTING	
Physiography	A-I-1
Geology	A-I-1
Soils	A-I-2
Climate	A-I-7
River Characteristics	A-I-9
Point and Nonpoint Discharge	A-I-19
Water Quality	A-I-22
Temperature and pH	A-I-22
Water Quality Standards	A-I-24
Dissolved Oxygen	A-I-28
Total Dissolved Solids, Chlorides, and Sulfates	A-I-28
Nutrients: Ammonia, Nitrate, and Phosphate	A-I-28
Fecal Coliforms	A-I-29

TABLE OF CONTENTS (continued)

	<u>Page</u>
Conclusions	A-I-30
Ground Water Resources	A-I-30
Ambient Air Quality	A-I-31
Ambient Noise Levels	A-I-32
BIOLOGICAL SETTING	
Terrestrial Habitats and Vegetation	A-I-33
Wildlife	A-I-34
Dominant Mammal Species	A-I-34
Dominant Bird Species	A-I-34
Dominant Reptile Species	A-I-35
Aquatic Habitat	A-I-35
Stream Bottom Organisms	A-I-36
Fish	A-I-38
Vectors	A-I-39
Endangered and Threatened Species	A-I-42
SOCIAL AND ECONOMIC SETTING	
Current Land Use	A-I-44
Population Characteristics	A-I-44
Economic Characteristics	A-I-47
Transportation Facilities	A-I-47
Public Utilities	A-I-48
Esthetic Characteristics	A-I-49
Recreation	A-I-49
Historical Development	A-I-49
Archeology	A-I-49
FUTURE SETTING WITHOUT THE PROJECT	
Future Environmental Conditions	A-I-51
APPENDIX A-II	
HISTORY OF COORDINATION	A-II-1
APPENDIX B	
MEMORANDUM OF AGREEMENT	
APPENDIX C	
LETTERS OF ASSURANCES	
APPENDIX D	
404 EVALUATION REPORT	

SECTION I - PROJECT DESCRIPTION

1.01 Project Authorization. The 87th Congress, 2nd Session, in the Flood Control Act of 1962 (Public Law 87-874) authorized the Corps of Engineers to provide channel improvement and modification to existing levees along the East Fork of the Trinity River and improvements to Lavon Dam and Reservoir. The channel and levee portions of the project are designed for local protection against flooding of productive agricultural lands located on or adjacent to East Fork. The Lavon Dam improvement is essentially completed, and deliberate impoundment of additional water began 1 December 1975, therefore, most of the information addressed herein relates to the East Fork portion of the project (and more particularly to the lower 10.8 miles of the stream designated as Increment I).

1.02 Authorized East Fork Project. The authorized plan of improvement for the East Fork consists of widening, deepening, and realigning the existing 31.8 mile long channel, and strengthening and raising about 38.3 miles of existing levees in six separate levee districts. The plan also calls for the replacement or modification of inadequate levee sluice structures, the alteration or relocation of railroad or highway and county road bridges crossing the channel, and the relocation and alteration of existing gas and power lines within the project limits.

1.03 East Fork Project History. During the design stage of the project, some of the levee districts in the upper reach of the project could not provide the local assurances required by Section 3 of the Flood Control Act of 1936 for local flood protection projects. Therefore, the project was divided into two segments, each of which was incrementally economically justified. Because of a lack of local assurances, Increment II was placed in abeyance. Kaufman County Municipal Utilities District No. 1 (previously Kaufman Levee Improvement District No. 4 (K-4)) and Kaufman County Levee Improvement District No. 5 (K-5) agreed with the US Government to provide the necessary local assurances for construction of Increment I improvements from the mouth of the East Fork to river mile 10.8 (see figure 1). The contract for construction of Increment I was awarded on 14 July 1972. Numerous prolonged floods caused extreme difficulty in executing the contract which was terminated on 1 August 1975 with only 35 percent of the work completed (see figure 2). Since the Lake Lavon modification is now complete, the work on Increment I can be restarted with a reduction in adverse working conditions.

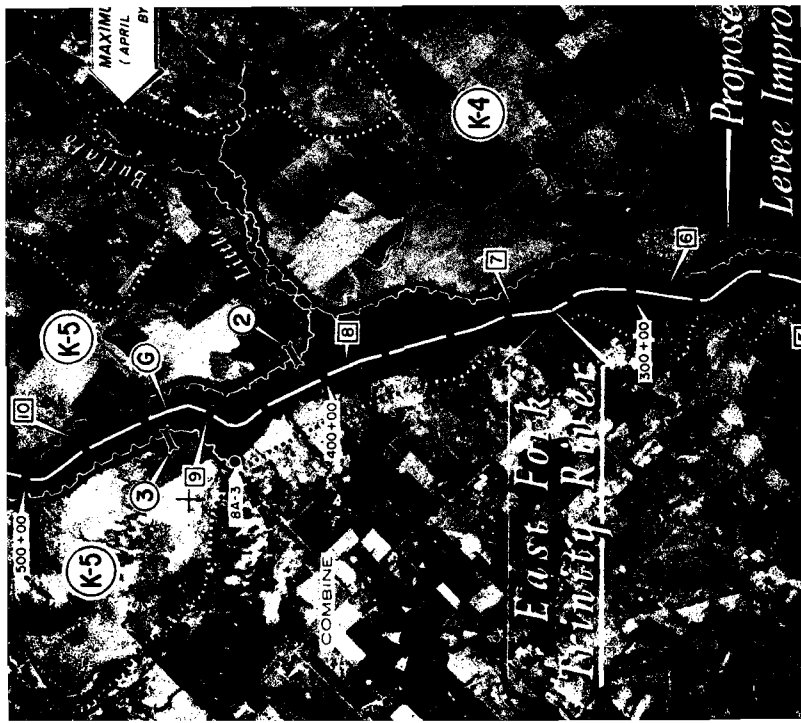
1.04 Nature of the Proposed Action. The channel construction and levee modification work for Increment I will be conducted in two phases. Phase I consists of the vegetation clearing of the remaining portions of the channel right-of-way and areas in proximity to the river side toe of the levees where the 4.5 million cubic yards of excavated material will be placed behind dikes for drying, and the actual construction of the channel. The channel configuration will be generally trapezoidal

with 80 feet bottom width and 1 vertical on 3 horizontal side slopes. The average depth of the excavated channel will be about 18 feet. Bankfull channel capacity will be 11,500 cfs and designed such that it will carry a minimum of 5,000 cfs below the damaging levels behind the levee to allow unhampered draining of farm lands during normal flood releases from Lavon Lake.

1.05 Phase II, the levee modifications, will commence approximately 2 years after phase I has been completed and will consist of strengthening and raising existing levees. The top grades of the improved levees will be established to a minimum distance of 2 feet above the design water surface for 54,000 cfs at the upper end of the Increment I project area and 60,000 cfs at the East Fork mouth. This levee height will contain floods with a 50-year recurrence interval. Interior drainage will be provided through sluice structures, some of which will be riprapped. Figures 3 and 4 at the end of this section depict graphic relationships between the existing and proposed channel, Increment I.

1.06 To minimize erosion, control measures will be used for the floodway slopes, channel slopes of lateral drainageways, the crown and side slopes of levees, and relatively flat areas between the channel slopes or levees and the right-of-way boundaries. The side slopes of floodways and levees and the levee crowns will receive intensive erosion control treatment consisting of smoothing, fertilizing, tilling, seeding, and mulching. Areas other than floodway and channel slopes and levee crowns and side slopes will receive the above treatment with the exception of smoothing and mulching. Slopes which have become gullied between completion of construction and commencement of erosion control operations will be smoothed using blade equipped machinery. Fertilizer will be applied at the rate of 400 pounds of 16-20-0 per acre followed within 24 hours by tillage to a depth of 4 inches. Tillage will consist of plowing and replowing with a chisel plow, disking and harrowing to provide a well pulverized seedbed. Seed will be planted at the rate of 3 pounds of pure live seed of King Ranch bluestem and 8 pounds of common Bermudagrass and 7 pounds of Northrup King 37 Bermudagrass per acre. This seed mixture, along with 2 tons of native prairie hay mulch per acre, will be used on all slopes including levee crowns. The mulch will be anchored in the soil to a depth of 2-3 inches using a mulch anchoring machine. On the relatively flat areas, 15 pounds of treated Buffalograss, 8 pounds of common Bermudagrass, and 7 pounds of Northrup 37 Bermudagrass seed will be planted per acre following fertilizing and tilling. All seed will be spread using a native grass seed drill. Erosion control treatment will be applied as sections of the floodway are completed. There are an estimated 575 acres of levee and channel slopes and 175 acres of relatively flat areas in Increment I.

1.07 Project Benefit-to-Cost Ratio. Based on an interest rate of 3-1/8% and using October 1977 price levels and a 100-year amortization period, the benefit-cost ratio for the authorized Lavon Modification and East Fork Channel is 1.40 to 1.00. Based on the same interest rate, levels and amortization period the incremental benefit-cost ratio for Increment I of the East Fork Channel project portion of the overall authorized project is 0.55 to 1.00.



LEGEND

500+00 DRAINAGE AREA BOUNDARY

IMPROVEMENTS IN FEET, IMPROVED CHANNEL

EXISTING LEVEE-PROPOSED IMPROVEMENT

MAXIMUM FLOOD OF RECORD
(EXISTING CONDITIONS)

KAUFMAN COUNTY
LEVEE IMPROVEMENT DISTRICT NUMBER 4

MILES ABOVE MOUTH, EAST FORK

84. 8 INCH ANGER BORING AND HOLE NUMBER

U.S. HIGHWAY MARKER

PROPOSED BRIDGE ALTERATIONS:

- (A) REPLACE 180' L.F. OF EXISTING BRIDGE.
(U.S. HIGHWAY 80)
- (B) REPLACE TIMBER PILING IN 10 BENTS.
(T & P RAILROAD)
- (C) REPLACE 180' L.F. OF EXISTING BRIDGE.
(COUNTY ROAD, OLD U.S. HIGHWAY 80)
- (D) CONSTRUCT NEW BRIDGE.
(FORNEY-SEAGOVILLE ROAD)
- (E) ADD PROTECTIVE WORKS.
(U.S. HIGHWAY 175)
- (F) ADD PROTECTIVE WORKS, REPLACE TIMBER PILING IN 7 BENTS.
(T & N.O. RY.)
- (G) CONSTRUCT NEW BRIDGE
(COMBINE-CRANDALL ROAD)

LEVEE-SLICE STRUCTURES			
SLICE NUMBER	KAUFMAN COUNTY LEVEE DISTRICT	EXISTING OUTLET STRUCTURE	RECOMMENDED OUTLET STRUCTURE
1	NO. 4, LEFT BANK	2-72" C.M.P.	2-72" DIA. X 180' LONG C.M.P.
2	NO. 5, LEFT BANK	2-30" C.M.P.	1-5' WIDE X 3' HIGH X 158' C.B.C.
3	NO. 5, RIGHT BANK	1-36" PUMP	2-3' WIDE X 3' HIGH X 181' C.B.C.
4	NO. 6, RIGHT BANK	1-48" C.M.P.	3-5' WIDE X 3' HIGH X 75' C.B.C.
5	NO. 6, RIGHT BANK	1-36" C.M.P.	3-4' WIDE X 3' HIGH X 90' C.B.C.
6	NO. 10, RIGHT BANK ABOVE HILLSIDE DRAIN	1-50" PUMP	NO CHANGE
7	NO. 10, RIGHT BANK BELOW HILLSIDE DRAIN	2-48" C.M.P.	NO CHANGE
8	NO. 13, LEFT BANK ABOVE MUSTANG CR.	1-18" C.M.P.	1-4' WIDE X 3' HIGH X 95' C.B.C.
9	NO. 13, LEFT BANK BELOW MUSTANG CR.	2-60" C.M.P.	1-5' WIDE X 3' HIGH X 150' C.B.C.
10	NO. 15, LEFT BANK	3-36" C.M.P.	3-4' WIDE X 3' HIGH X 105' C.B.C.

EXISTING LEVEE

Old Channel, East Fork Trinity River
Belt Slough
Proposed Channel Improvement
80 FT. BOTTOM WIDTH, 1 ON 3 SIDE SLOPES

STA. 0+00 BEGIN CHANNEL IMPROVEMENT PROJECT

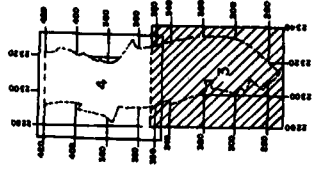
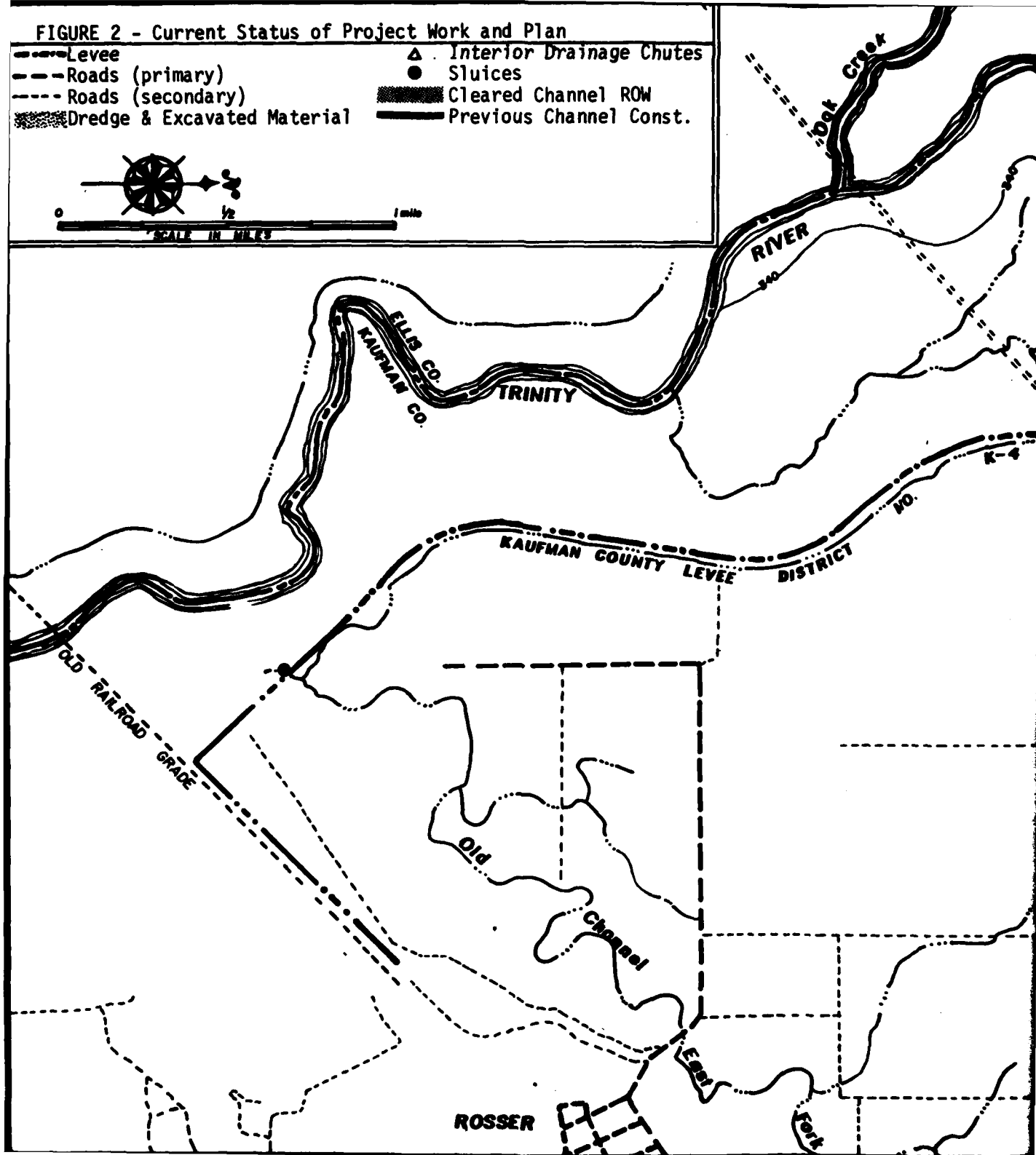
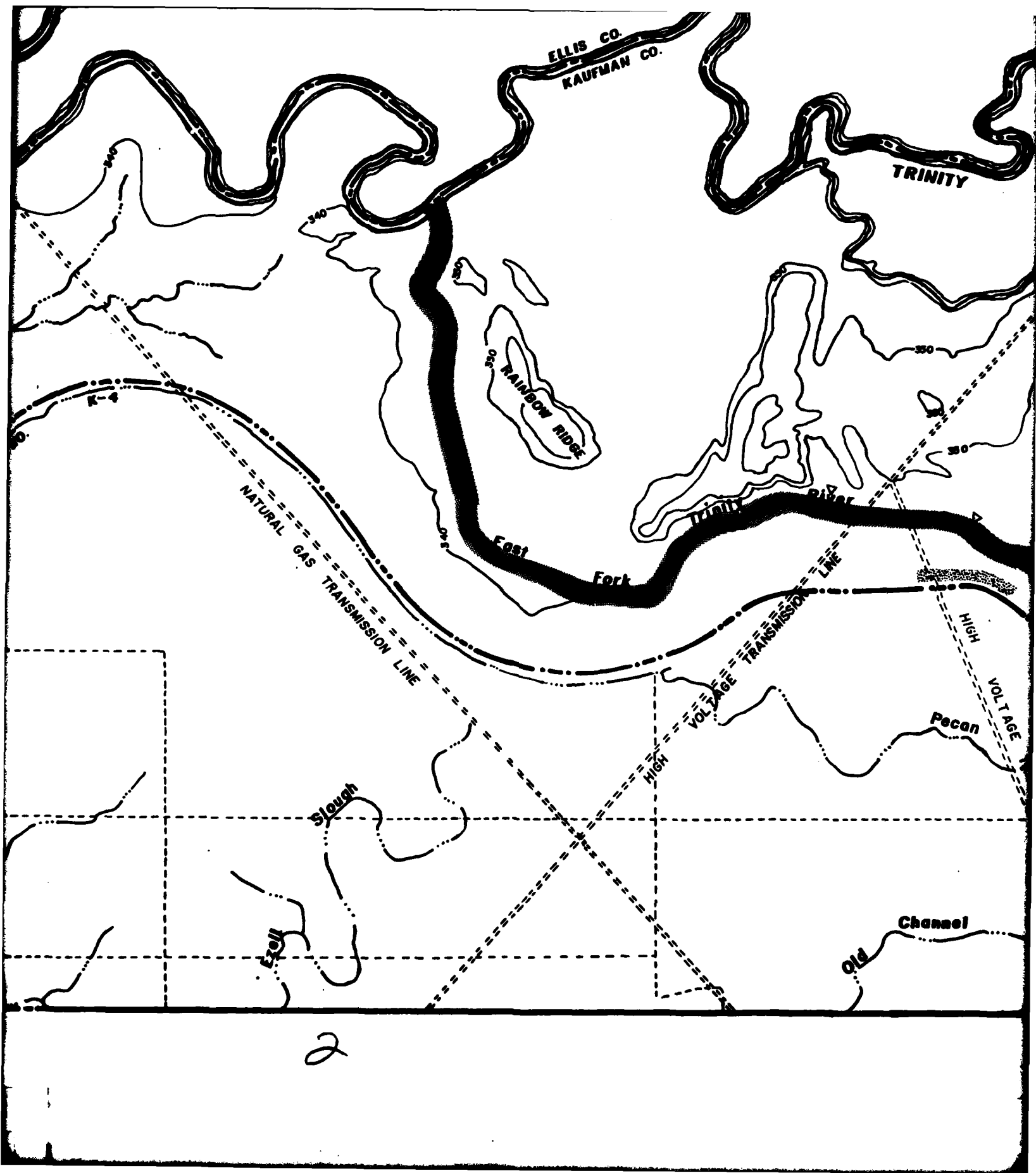


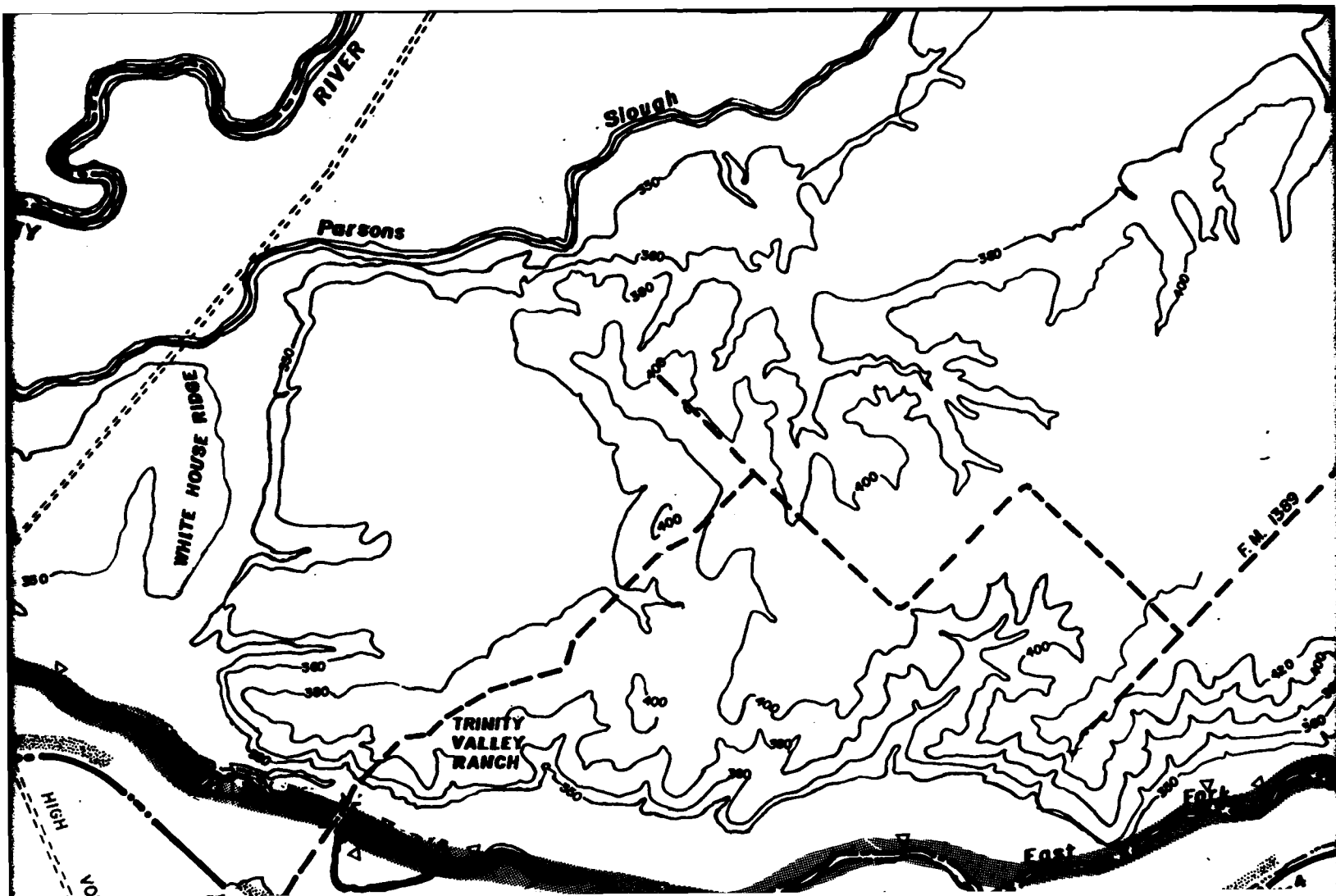
Figure 1
Photomosaic of Increment I
Project area

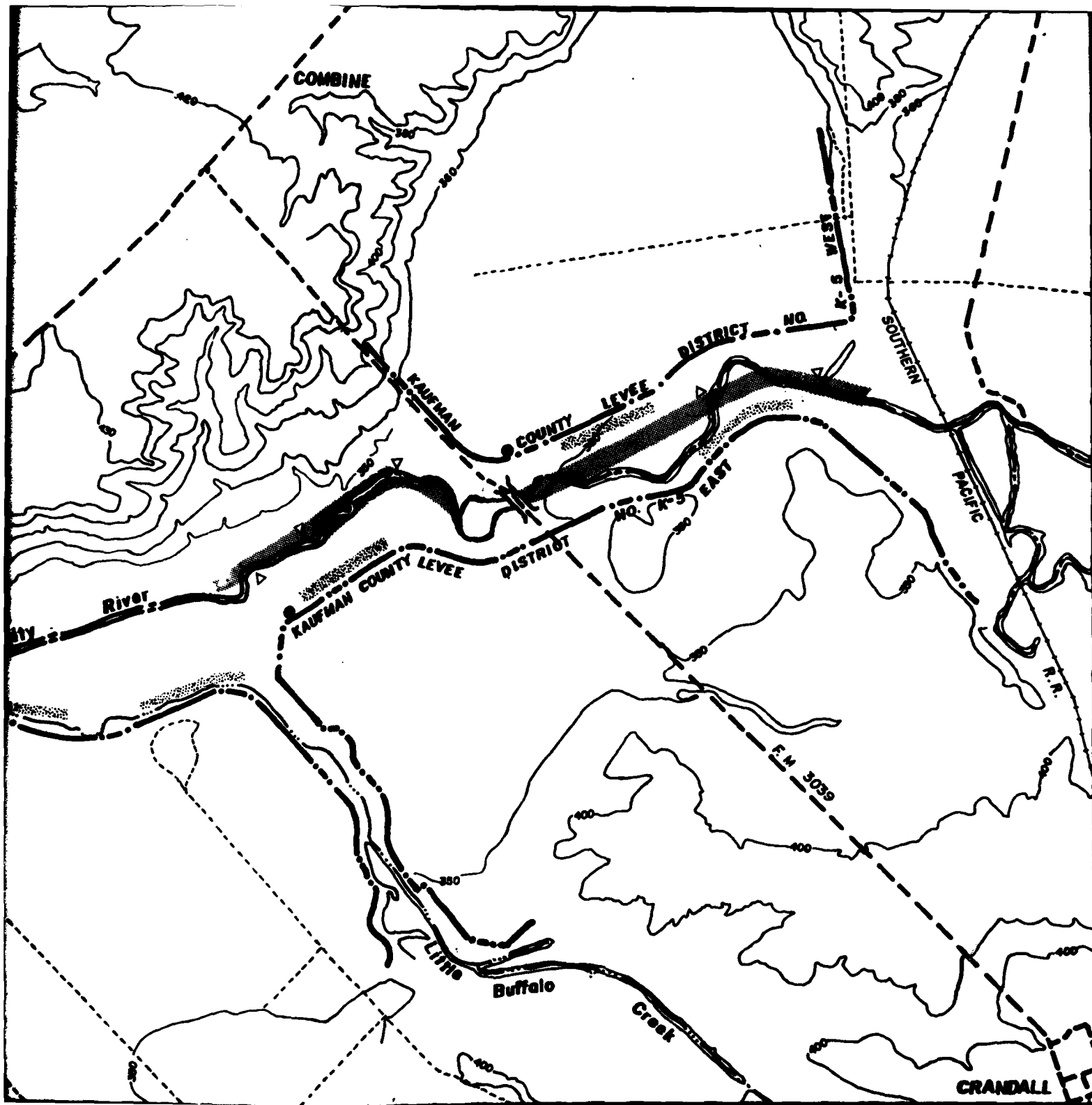
FIGURE 2 - Current Status of Project Work and Plan

- | | |
|-------------------------------|----------------------------|
| --- Levee | △ Interior Drainage Chutes |
| --- Roads (primary) | ● Sluices |
| --- Roads (secondary) | ▨ Cleared Channel ROW |
| ▨ Dredge & Excavated Material | — Previous Channel Const. |









ELEVATION IN
FEET (MSL)

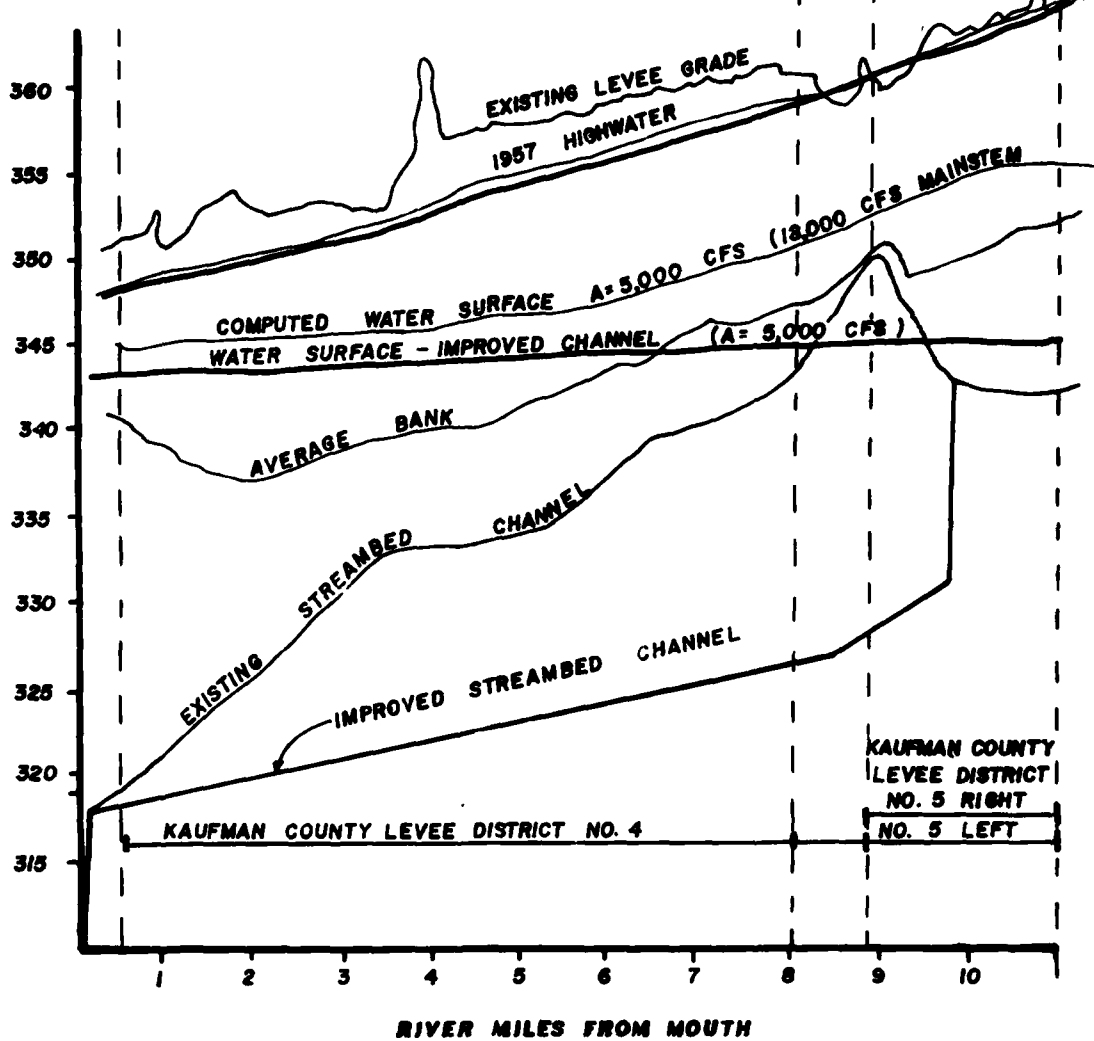


Figure 3. Relationship between existing and proposed channel, levee and water level increment I

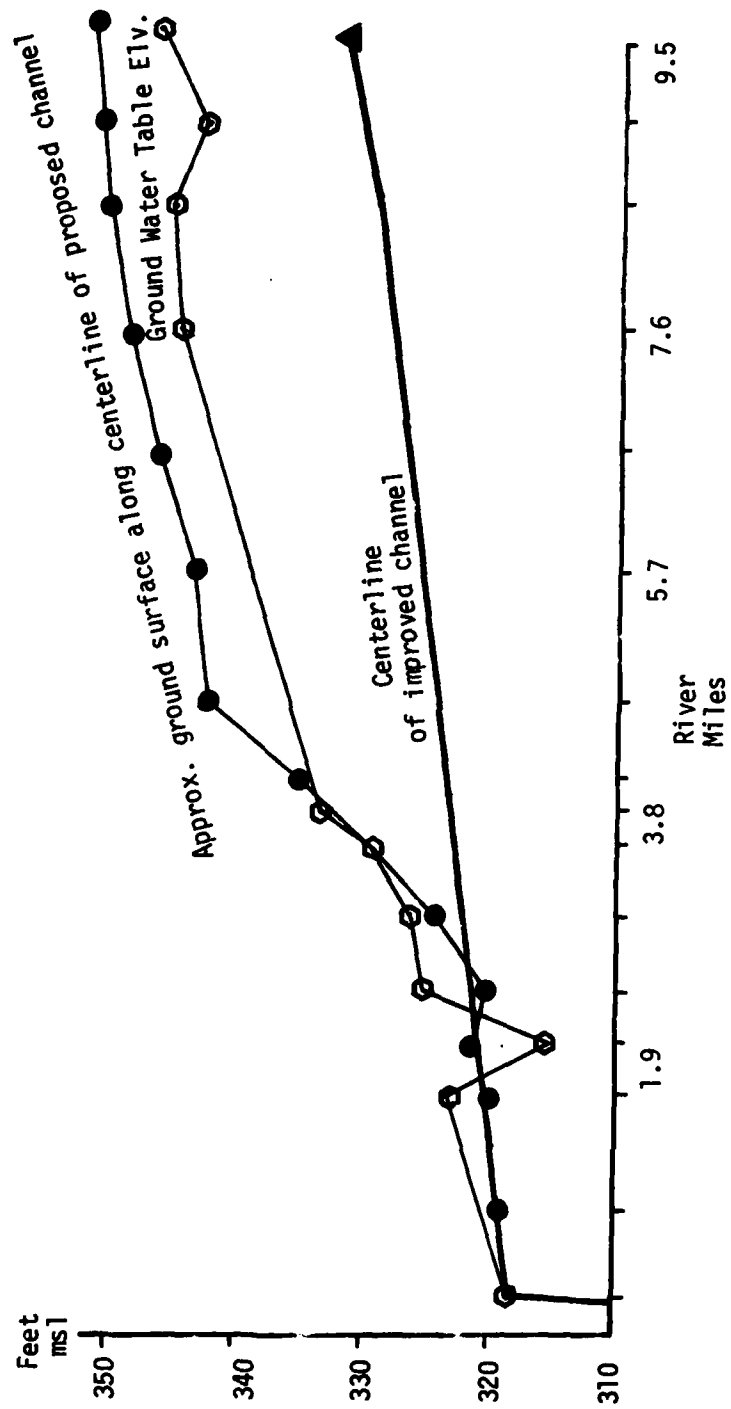


Figure 4. Relationship of ground water table elevation (1967 borings) to proposed channel grade and existing ground level.

SECTION II - ENVIRONMENTAL SETTING WITHOUT THE PROJECT (See appendix A-I for detailed data)

PHYSICAL SETTING

2.01 Physiography. The valley of the lower East Fork of the Trinity River is located about 25 miles southeast of the city of Dallas, Texas, and is situated within the Blackland physiographic province. This province is characterized by gently rolling low hills. The lower East Fork flood plain is about 2 miles wide and relatively level, bordered on the west by gently rolling hills which rise about 100 feet above the flood plain. Prior to initial channel realignment and levee construction during the very early 20th century, the East Fork followed a meandering streambed located approximately 1 mile east of the existing river. This old East Fork of the Trinity River comprises part of the general slough area across the flood plain from Little Buffalo Creek to the vicinity of Rosser where it joins with the Trinity River mainstem. Part of the slough system within the broad East Fork flood plain is comprised of Pecan Slough and Ezell Slough, both shallow water areas with dense vegetation of large pecan trees and other hardwoods. Together with the old East Fork of the Trinity, these sloughs serve to collect runoff from the agricultural lands of the levee protected area and eventually terminate at the Trinity River mainstem.

2.02 Geology. The bedrock underlying the project site is primarily composed of:

Upper Taylor marl - a calcareous grey clay or soft shale which becomes white where exposed to the weather. It is soft and plastic when wet but has a hard chalky appearance when dry.

Wolfe City marl - a sandy calcareous clay with layers of hard sandstone, black shale, and scattered phosphatic nodules.

Lower Taylor marl - an unconsolidated dark grey calcareous clay which becomes medium grey to tan when exposed to the weather. It is firm and hard when dry but disintegrates to mud when wet.

With the exception of minor amounts of sand, gravel, and clay, there are no known economic mineral deposits in the project area.

2.03 Soils. The flood plain soils of the lower East Fork are soft, calcareous, clayey, alluvial soils which have very poor internal drainage. The natural vegetation is hardwoods, but the soils will support crops and pasture where other conditions permit. The soils of the surrounding uplands are firm, calcareous, clay soils with low permeability except when dried to the point of crack formation. The natural vegetation is tall prairie grass, and the soils are best suited to pasture. Soil along the line of the proposed channel consists of highly plastic clays with consistency varying from soft to medium.

2.04 Chemical tests of channel and flood plain soils and sediment soils were made on samples taken from existing stream channel, proposed channel relocation sites, and material disposal sites. Tests were run for heavy metals, total organic carbon, nitrogen, bacteria, pesticides, and oil and grease. Because flows in the East Fork consist in large part of effluent from several sewage treatment plants, evidence of the presence of several heavy metals in varying concentrations was found as was nitrogen, bacteria, some pesticides, and oil and grease.

2.05 Climate. The area climate has a continental flavor which is warm, humid, subtropical with hot summers and mild winters. Average temperatures range from 95 degrees F. in July to 35 degrees F. in January. Annual precipitation is approximately 39 inches with high rainfall levels in April and May and low levels in August and September.

2.06 River Characteristics. Source of the East Fork is in southern Grayson County. It flows southerly for 110 miles, interrupted by the Lavon and Forney dams, to its confluence with the mainstem Trinity River, draining some 1,256 square miles. The stream depth in the proposed project area varies from 2-15 feet with an average depth of 6 feet. Partial channelization and straightening have been completed on the first 5 miles from the mouth. Flow conditions depend on factors such as releases from Lavon Lake, Lake Ray Hubbard, return from Garland and Mesquite sewage treatment plants, and quantity and intensity of precipitation.

2.07 Point and Nonpoint Discharges. Six waste treatment facilities are located along tributaries entering the East Fork below Forney dam and have a combined discharge rate of approximately 25 million gallons per day. Nonpoint discharges into the East Fork include urban, residential, and agricultural runoff which contribute 21 percent of the 5-day BOD loading and 97 percent of the sediment load.

2.08 Water Quality. Texas Department of Water Resources (TDWR) water quality standards parameters include temperature, pH, dissolved oxygen, fecal coliforms, dissolved chlorides, dissolved sulfates, and total dissolved solids. Records for the period 1973-76 indicate that temperature standards were not exceeded. All pH values recorded for the period 1969-76 fall within the set standards. Dissolved oxygen levels of the 1973-76 period fell below set standards 30-50 percent of the time. Dissolved chlorides, sulfates, and solids fell within standards during the 1973-76 period. Of 17 samples collected for coliform counts, 13, or 76 percent, exceeded the allowable variation requirement for the 1974-76 period. This segment of the East Fork is considered an "inland effluent-dominated stream" by the TDWR (1976).

2.09 Ground Water Resources. Except for shallow wells of limited capacity, the quantity and quality of ground water are somewhat limited in Kaufman County.

2.10 Ambient Air Quality. Air quality of the Dallas-Fort Worth air basin is relatively good. For this reason and because the East Fork project area is located approximately 30 miles from concentrated urban center of Dallas, air quality at the project area is probably high throughout the year.

2.11 Ambient Noise Levels. Ambient noise levels within the project area are typical of those of most rural areas.

BIOLOGICAL SETTING

2.12 Terrestrial Habitats and Vegetation. Southwestern Kaufman County is dominated by upland prairie and flood plain woodland. The study area lies mostly in the flood plain woodland habitat. The East Fork flood plain in the study area contains about 3,000 acres of woods and thick understory. This woodland is composed of oak, hickory, pecan, ash, box elder, willow, and cottonwood. In the bottom and upland region of the project site, trees such as oak, ash, cedar elm, bois d'arc, and mesquite are found. Understory is primarily box elder and mulberry. Frequent floods and general lack of use in the original East Fork channel since levee construction have permitted development of a native bottom woodland, some of which may be near early climax.

2.13 The work previously undertaken within the project area resulted in 275 acres of clearing for channel right-of-way and 177 acres cleared along levees and various haul routes.

2.14 Wetlands. Much of the project area is low lying, flat, and subject to inundation by flooding, with bars, marshes, and sloughs evident in a number of areas. In addition, about 3,000 acres of bottomland woodland (seasonally flooded) is found in the project area. True wetland areas occur on small shallow impoundments and sloughs near the existing channel, particularly in the vicinity of County Road 3039.

2.15 Wildlife. In areas where the channel is ill defined, herons, egrets, ducks, nutria, and beaver find excellent habitat. In recently renovated channel areas representative of early successional stages, red-eared turtle, cottonmouth, alligator snapping turtle, box turtle, and sliders can be found. Many small mammals and birds come out of the woodlands to feed on forbs growing in the previously disturbed areas of the project area.

2.16 Aquatic Habitat. The area contains free flowing stream, impoundments, and sloughs. The poor water quality limits what could be a highly productive aquatic environment. Reaches of the stream which have been cleared now have a lower species diversity than the undisturbed reaches. Stream bottom dwelling organisms existing throughout the project area are characteristic of those which can tolerate conditions of water pollution.

2.17 Fish. An average low oxygen level appears to be the major limiting factor of fish species. Fish species in the area are limited to rough fish or species tolerant of low oxygen content and high pollution levels.

2.18 Vectors. Vectors are organisms that carry and transmit parasites (e.g., mosquitoes, ticks, fleas) that can ultimately transmit diseases to man and (or) his domestic animals. Eight species of vectors representing five genera are present in the project area. They may be causing some disease conditions but are not of a widespread nature.

2.19 Endangered Species. No listed endangered species of flora or fauna have been found to exist in the project area.

SOCIAL AND ECONOMIC SETTING

2.20 Land Use. Eight categories of land use were identified in the 4,424-acre study area, with 2,975 acres in woodlands and the remainder used for agricultural pursuits. The Soil Conservation Service reports that 49 landowners in or near the study area would benefit from project improvements reducing the extent and frequency of flooding.

2.21 There are seven small communities within proximity of the project area.

2.22 In Kaufman County, 24 percent of agricultural lands is used for pasture, and 49 percent is planted in crops. The remainder is idle or has other uses.

2.23 There is a network of private and county roads and a railroad in the project area. No telephone lines, one high voltage power transmission line, and a natural gas pipeline cross the project area.

2.24 Esthetics. The project area presents a diverse scene in that areas of improved pasture and croplands are interspersed among areas of woodland. The lowlands, with the diversity of plant species, provide a haven for a diversity of wildlife. This setting provides pleasure to the senses of those who are aware of the surroundings.

2.25 Recreation. Recreation for the general public is limited to bank fishing at stream crossings and some small caliber firearms target shooting.

2.26 Historical Background. Historically the area was "home" to white tailed deer, buffalo, bear, and small animals. This provided meat, fish, and pelts. The lower East Fork has been settled since the early 1800's. Cotton became an important part of the local

economy in the late 1800's. Through channel and levee construction in the early 1900's, much of the flood plain was developed for crop production and pastureland.

2.27 Archeology. Two sites were located which are in proximity to the project. One is in the vicinity of Sand Hill, and the other is near the confluence of the East Fork and the Trinity mainstem.

FUTURE ENVIRONMENTAL SETTING WITHOUT THE PROJECT

2.28 In the absence of this or some other major project, no significant changes in the environment of the project area are anticipated.

SECTION III - RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS

3.01 Information provided by the North Central Texas Council of Governments indicates that no formulated land use plans have been developed for the region. A comprehensive land use plan has been developed by the city of Seagoville (1976), but no plans exist which are applicable to the lower East Fork of the Trinity. Kaufman County has no plans which would be affected by the project. Watershed work by the Soil Conservation Service on lands east of the project site has been completed, and no additional plans have been developed within the region. The Texas General Land Office and the Texas Parks and Wildlife Department report the formulation of no State management plans covering the study area. The major landowner of the region, Trinity Valley Ranch (Southland Land and Cattle Company) indicates no plans for development which conflict with the proposed project.

SECTION IV - THE PROBABLE IMPACT OF THE PROPOSED ACTION ON THE ENVIRONMENT

PHYSICAL IMPACTS

4.01 Effects on Flood Frequency and Duration. Project implementation will provide beneficial reduction in flood frequency and duration to Kaufman County Municipal Utilities District No. 1 and to Kaufman County Levee District No. 5. The present flooding patterns within the study area are characterized by frequent overbank flooding in the flood plain near the channel and occasional flooding within levee protected areas. There are recent breeches in levee structures and inadequate drainage structures for runoff from within leveed areas. The proposed levee improvements, in conjunction with the improved channel and sluices, will provide protection to the leveed area for floods up to magnitude of a 50-year flood. A reduction in the duration and frequency of flooding in the flood plain near the channel will also occur due to improved East Fork channel capacity. Travel time of flows through Increment I will be reduced by about one-half hour, creating negligible change on any flood downstream.

4.02 Effects of Lowered Channel Level. Channel construction within Increment I will create a depressed streambed that will be, at some points, in excess of 13 feet below the present stream level. If not compensated, this base level change would affect the tributary streams, greatly increasing their gradient. Increased fall of the tributaries would cause major readjustment in the stream equilibrium with associated changes in size, length, or sinuosity of the channel. In order to minimize changes to the channel regime of tributaries or of the East Fork channel upstream from the Increment I project area, controlling weirs will be constructed at the point where each stream enters the depressed channel. As long as the weir structures remain intact, there should be no change in the present regime of the tributaries or of the upstream segment of the lower East Fork.

4.03 Impacts on Water Quality. Completion of the proposed Increment I channelization of the East Fork of the Trinity River will involve short term degradation of surface water quality during construction. Long term changes in water quality will result from streambed alterations. The primary effect on water quality during channelization will be related to the disturbance of area soils and sediments. The flood plain contains moderate to high concentrations of heavy metals, specific pesticides, coliforms, nutrients, and oil and grease. Re-suspension of sediments and erosion of soils during channelization and levee construction will temporarily add to the total pollutant load of the East Fork. The increased sediment load will increase total suspended solids concentrations and add to the existing oxygen demand caused by wastewater treatment facilities' effluents. Temporary reductions in the dissolved oxygen concentration to near 0.00 mg/l may result during low flow cycles. Resuspended and redissolved pollutants

from soils and sediments may pose additional hazards to the limited aquatic life present in the East Fork.

4.04 Levels of total suspended solids in the lower East Fork may increase temporarily during channelization and levee construction to concentrations as high as 1,000 mg/l, but will decrease rapidly downstream from the construction site due to settling and dilution effects. Slight increases in total suspended sediments may be evident on the Trinity mainstem for several miles from the point of confluence with the East Fork during channelization and levee construction. The amount of turbidity and sedimentation which will occur in the East Fork will depend on many factors including discharge rates, flow velocities, erosion and sedimentation controls, and precipitation amounts during channel and levee construction. Mitigation measures to control erosion and sedimentation, combined with favorable weather conditions, may reduce the temporary adverse water quality impacts.

4.05 Approximately 4.5 million cubic yards of excavated material will be removed during the straightening and channelizing of the present East Fork streambed. Suitable material from channel excavation is planned to be used as fill for rebuilding and strengthening levees, while less desirable excavated materials will be placed behind dikes in low areas within the flood plain and along the river side of levees. Impacts to water quality due to erosion of the poor soil or contamination by excavated material leachate should be minimal. Extensive erosion control measures (turfing, mulching, and smoothing) will be employed to prevent the erosion and sedimentation of these materials, and the quantity of excavated material capable of producing polluted leachate is quite limited as indicated by stream sediment studies.

4.06 Long Term Impacts. Physical changes due to channelization will include a slight decrease in river flow distance (approximately 10 percent), increased width and depth of the flood control channel, removal of bank vegetation (mainly trees) as well as vegetation within channel right-of-way (90 percent complete), and decreased slope angles of channel banks. The total distance of Increment I work is 9.78 river miles with a total elevation drop of approximately 17 feet.

4.07 Impacts to water quality will be limited mainly to periods of low flow when water in the improved channel will have a shallow wide profile with an increased surface area and decreased velocity as compared with the existing channel flow characteristics. Increased sedimentation may occur during low flows but will become resuspended during higher flows. Dissolved oxygen levels are projected to remain above the stream standard of 20 mg/l during effluent dominated low flows (tables 7 and 8, appendix A-I). Adverse impacts to water quality include a slight increase in water temperature during low flow cycles. Factors which contribute to an increase in maximum water

temperatures include increased radiation and convection heat adsorption due to increased surface area and removal of shade cover. This increase in the average water temperature during low flow periods was given consideration in model projections of DO and will increase the rate of oxygen depletion slightly due to increased biological activity. Soon after construction, the stream is expected to create a smaller meandering channel within the confines of the improved channel which will be used during periods of "normal" flow.

4.08 Effect on Ground Water. Under present normal flow conditions, ground water in the alluvium slowly discharges into the stream. During flood conditions, overflow from the channel infiltrates the alluvium in inundated areas elevating the ground water level. Ground water levels from 1967 borings indicate some variation in levels along the lower East Fork. In general, ground water is near the surface at the mouth of the East Fork and at increasing depths toward the north end of Increment I of the East Fork (see figure 4, page I-6).

4.09 The potential increase in the hydraulic gradient between the ground water level and the lowered stream water level in the new channel combined with the potential decrease in inundated areas due to improved channel and levee capacity may contribute to a decline in ground water levels near the improved channel, although this decline is expected to be slight due to the low transmissibility of flood plain soils. The increased containment of floodwaters by the proposed improved channel should not be a major influence on flood plain ground waters since the primary recharge mechanism of the alluvial aquifer is infiltration of rainfall outside the channel area.

4.10 The degree of ground water seepage caused by the proposed increased channel depth will be related to hydraulic gradient between the water table elevation and channel water surface elevation. There is no significant hydraulic gradient in the lower portion of the channel near the mouth of the East Fork, but there will be a 15-foot hydraulic gradient in the upper portion of the channel. It is expected that some decrease in the ground water levels may occur in the upstream portions of the study area during periods of low or normal flow. Higher water levels or floods will return ground water to near existing levels.

4.11 Effect on Air Quality. Channel construction and levee modification will produce short term degradation to air quality within the project area and immediately adjacent to the site. Increased air pollution will include machinery exhaust emissions and fugitive dust from machinery movements. Onsite machinery and vehicles will be primarily draglines, bulldozers, and trucks. The majority of the equipment will be diesel powered, and emissions will include carbon monoxide, hydrocarbons, nitrogen oxides, and particulate matter. Actual quantities of pollutants cannot be calculated due to several unknown variables such as specific

equipment to be used, equipment maintenance and operation practices, and types and quantities of material to be moved. Furthermore, meteorological conditions will influence the persistence of airborne contaminants. Variables such as amount of sunlight, wind speed, and mixing heights all affect the concentration of pollutants generated from machinery and vehicle exhaust. During dry summer months, considerable dust may become airborne both within the project area and along county and private roads traveled by construction crew personnel. Because the site is remote and lies in a leveed river bottom which is often wet, excessive amounts of dust are not expected to be encountered.

4.12 Effect on Noise Levels. Noise generated from construction equipment will be noticeable within and adjacent to the project area. In the immediate vicinity of equipment, noise levels will be objectionable. Little research has been conducted concerning the effects of noise on animal life; however, it is reasonable to assume that noise, along with general construction activities, will temporarily displace the majority of the terrestrial wildlife of the project area.

4.13 Increased noise at the construction site will not affect any populated areas. Because the project area is located a considerable distance from inhabited areas, noise impacts are not expected to be great. At distances of 1,320 feet ($\frac{1}{4}$ mile) from the machinery, construction noise should be below ambient levels and will be noticeable as a background noise.

ECOLOGICAL IMPACTS

4.14 Effect on Terrestrial Habitat and Wildlife. Proposed construction of the remainder of the East Fork Trinity River channel (Increment I) will have an adverse impact on vegetation (wildlife habitat) along 4,000 linear feet of right-of-way. Clearing of the right-of-way will remove 37 acres of bottomland woodlands and consequently displace an undetermined amount of wildlife. Clearing will be limited to the zone which is to contain the area of the side slopes of the new channel plus a contiguous strip 50+ feet wide on either side of the new channel's side slopes. All felled trees and other burnable materials will be piled and burned or otherwise disposed of by the contractor.

4.15 Trees and understory species which will be removed are mainly ash, mulberry, box elder, and pecan. Until the cleared areas are revegetated by early successional growth, the carrying capacity of the site for birds and other wildlife will be extremely low. Direct loss of this bottomland habitat will displace mammals such as raccoon, opossum, squirrel, mice, and rats. Among the birds which will be driven from feeding and nesting areas are woodpeckers, owls, chickadees, titmice, and other songbirds. Several species of turtles, snakes, and lizards, as well as amphibians also will be subjected to loss of habitat. Due to competition, most of the displaced wildlife will eventually perish.

4.16 In place of the existing bottomland woodlands, a new grass dominated lowland habitat will be created adjacent to the improved channel. This habitat will be preferred by bird species which feed primarily on seeds and insects, and by a variety of reptile life and small mammals such as rats and mice.

4.17 Effect on Aquatic Habitat. Improved drainage will severely reduce many areas along the East Fork that are periodically inundated, thereby reducing waterfowl habitat. The cleared area 1.5 miles north of the Trinity Valley Ranch bridge will be altered by improved drainage and will no longer provide habitat for egrets, migratory waterfowl, and shorebirds, or for aquatic mammals such as beaver and nutria.

4.18 Impacts on the aquatic ecosystem within the East Fork streambed include burial and alteration of the aquatic habitats, increased turbidity, and potential input of foreign substances. About 9 miles of riverbed with its associated streambed fauna and aquatic vegetation will be lost.

4.19 Some fish will likely be trapped and destroyed during the excavation operations. Others will be lost from gill abrasion due to increased turbidity. However, the majority of fish in the East Fork should be able to swim away from the stretch of river being channelized. Once construction is complete, the new channel will be recolonized within several months by stream bottom dwelling animals. Fish would also return shortly, and within 1 to 2 years, aquatic vegetation and mollusks would reinhabit their previous environment, and a new aquatic ecosystem will be established in this segment of the East Fork. Species with specific habitat requirements such as pools and riffles will be restricted for a longer period of time.

4.20 Several of the meanders will be blocked at both ends forming oxbow lakes, thus creating new aquatic habitats. Gar, gizzard shad, buffalo, carp, and other fish species that are normally found in the East Fork and are capable of adapting to turbid conditions will probably be the dominant fish in the oxbows. The stream bottom dwelling population will not be much different in the oxbow lakes than in the East Fork itself, consisting mainly of the midge larvae (chironimids), aquatic earthworms, and mollusks. With only periodic inflows of water during flood conditions, the oxbow lakes will be relatively clear and calm and provide conditions suitable for algal growth. The possibility of algal blooms in these lakes is therefore quite high.

4.21 Effect on Threatened and Endangered Species. There are no known species on the State or Federal endangered or threatened wildlife and plant lists which can be found specifically within the project area. However, four species are known to occur within Dallas County which are listed by the Rare Plant Study Center, University of Texas at Austin, as endangered or acutely endangered in Texas. These four are: Texas sedge, Hidalgo sedge, black footed quillwort, and Oklahoma phlox. The first three are found in wet areas. Oklahoma phlox is found in sandy woods (Correll and Johnson, 1970) and is unlikely to

occur in the muddy alluvial areas which are to be affected by the project. All except the phlox are known to be indigenous to East Texas and therefore may occur in southeast Kaufman County.

4.22 With regard to threatened or endangered wildlife, the only species which may be potential transients in the project area are the Arctic Peregrine Falcon and Southern Bald Eagle. No observation of either has been made within the Increment I project site. However, the habitat is suitable for the possibility of infrequent visits. Construction noise and general human activity in the construction area will be of a magnitude to disrupt feeding of avian wildlife.

4.23 Effect on Vectors. The proposed realignment of the East Fork channel would influence the vector and pest populations by destroying some breeding habitat while creating some new habitat. Some existing breeding areas for larvae in the East Fork itself will be destroyed due to improved drainage. Some small, shallow ponds may be created during construction, but it is not expected that these breeding pools would add significantly to the total number or size of such habitats. A much larger volume of suitable aquatic habitat would be added by creation of oxbows. This condition could increase the mosquito density in nearby areas and increase the potential abundance of disease vectors should a mosquito-borne outbreak occur.

SOCIAL AND ECONOMIC IMPACTS

4.24 Impacts on Land Use. Channel construction and levee modifications will directly affect an additional 37 acres of land through clearing of right-of-way and indirectly affect 4,424 acres within the leveed river bottom of the East Fork. Currently, about 3,000 acres of the project site are bottomland woods, and 197 acres have been cleared as extensions of pastures at two locations along the west side. These lands will become less wet as the frequency and duration of flooding are reduced by channelization. As the base level of the river is lowered, ground water saturation will be reduced. The effects of these hydrological changes will result in an alteration of the cleared flood plain to a dryer grass and brush environment.

4.25 Control of the East Fork Trinity and reduction of the frequency and severity of flooding in the leveed river bottom will create additional pasture suitable for grazing. Cleared areas along the levees, lands adjacent to the levees for haul routes, as well as the cleared channel right-of-way will provide excellent areas for grazing land. River channelization will benefit lands currently identified as cleared flood plain. Two such areas are located along the west side of the river and total nearly 200 acres, and an extension of existing pastureland is expected. Based on estimated carrying capacity of area pastureland, the acreage previously

unavailable for grazing will sustain approximately 66 head of cattle, and lands cleared for right-of-way will sustain 150 head of cattle. Additionally, many acres of marginal carrying capacity will be benefited, and some lightly wooded areas may be used for grazing. There are approximately 80 acres within the flood plain located southwest of Rosser which are used for cultivation, and with improved drainage this acreage may be increased to a limited extent.

4.26 Effect on Loss of Agricultural Production. As a result of flood protection provided by Increment I of the East Fork Channel and Levee Improvement Project, crop and livestock production losses will be significantly reduced on 15,031 acres of land. This reduction of agricultural flood losses comprises almost the total average annual flood control benefits of the channel project, which are computed to be \$236,800.

4.27 Effect on Employment. Short term benefits to area employment will be extensive as a result of channel construction, levee modification, and related work. Approximately 50 individuals will be needed for these efforts, the majority of which will be laborers. Personal income for the project has been estimated at \$29,000 to \$40,000 per month during peak periods. These impacts are expected to extend at various levels over 5 years. Following completion of the construction of the site, levee and channel maintenance will require periodic employment for a variety of individuals for vegetation control and channel, sluice, and levee maintenance. Depending upon the need, such endeavors will create short term employment for several laborers, as well as some supervisory personnel. Secondary impacts to the area economy will be reflected in a greater cash flow throughout the community as supplies for the project area are purchased and incomes are spent. Such secondary impacts will be reflected in improvements to local business economy. Long term benefits are likely to be realized with the need for additional agricultural personnel as a result of increased agricultural and livestock production.

4.28 Effect on Public Services and Transportation Facilities. There will be no impact on public services or transportation facilities, as required improvements have been completed as a result of previous work. Construction of Increment I has necessitated the installation of a new bridge at F to M Road 3039 and at Trinity Valley Ranch at Sand Hill. These structures have been installed at an expense to the State of Texas of \$274,000, and to Trinity Valley Ranch of \$33,000. No additional work is expected at either structure in the immediate future.

4.29 Effect on Esthetic Characteristics. The aesthetic character of the lower East Fork will be permanently altered as a result of project implementation. Noise and other aspects of construction will impact the tranquil nature of the area while the levees and channel

are being built. Clearing for right-of-way will destroy approximately 37 acres of woodland, and excavation will eliminate the existing river channel. These alterations will result in long term reduction of the aesthetic quality of the river bottom. Secondary aesthetic changes to the river bottom will occur as an area of relative non-use becomes one of agriculture and cattle production.

4.30 Effect on Recreation. As all of the land is privately owned and generally restricted from use by the public, recreation will remain at current low use levels. It is expected that construction along the levees at F to M Road 3039 crossing will temporarily affect the bank fishing at the area; however, these impacts will be minimal and temporary. No costs or benefits have been attributed to recreation in Increment I.

4.31 Effect on Cultural and Archeological Resources. Field investigations of the archeological resources of the area have revealed that two sites exist within the proximity of levee MUD 1. The Sand Hill area is suspected of containing artifactual material, but as levee modification will not directly affect the area, no adverse impact is anticipated.

4.32 A site of archeological interest is located along levee MUD 1 near Rosser. It might have been affected by levee modification if it had not been discovered and borrow had been acquired from the vicinity of the site.

4.33 Since the location of these resources are known, work to be done on this proposed project will be accomplished in a manner which will avoid disturbing them.

SECTION V - ANY PROBABLE ADVERSE ENVIRONMENTAL EFFECTS
WHICH CANNOT BE AVOIDED

5.01 Unavoidable Short Term Impacts. Noise and human activities associated with construction activities will temporarily displace wildlife which utilizes the area for feeding grounds.

5.02 Temporary degradation of air quality due to exhaust emissions from construction vehicles (primarily diesel exhaust) are unavoidable. Proper maintenance of equipment can help reduce these emissions. A second impact on air quality will result from dust both during initial construction and later levee modifications. This impact will be most noticeable to residents along county and private roads where construction machinery, trucks, and personnel travel. Dust will be controlled to a great extent by periodic applications of approved dust palliatives or water on the gravel or other unimproved roadbeds. Limiting hauling and movement of construction equipment to certain designated routes can also be used to alleviate dust and emission problems.

5.03 Dust, noise, human activity and the presence of construction machinery all result in impact to the tranquil aesthetic setting of the lower East Fork Trinity River area. During initial construction and later levee modification this aspect of the region will be unavoidably disrupted.

5.04 The most severe short term impact will be the loss or alteration of habitat. Additional clearing for channel right-of-way will remove about 37 acres of dense bottomland woods. The unavoidable loss of this amount of habitat will permanently displace an indeterminable number of terrestrial amphibians, reptiles, and mammals, as well as avian wildlife. Channel construction will also directly eliminate or alter approximately 6 miles of riverine habitat. Loss of wildlife habitat from clearing of vegetation will be minimized by limiting excessive clearing for channel right-of-way and for construction of temporary haul roads. Within areas where temporary clearing is essential, revegetation with fast growing herbaceous plants is expected immediately upon completion of construction to reduce the potential for erosion and long term displacement of wildlife.

5.05 Excavation and related work on the channel itself will cause complete unavoidable disruption of the river's biological community, along Increment I for a temporary period. Sessile organisms and macroinvertebrates with little mobility will be destroyed outright or covered by sediment (in downstream pool areas). Increased suspended sediments will be noticeable during the construction period both in the lower portions of Increment I and to a limited extent in the Trinity River mainstem. Oil and grease, pesticides (primarily DDT), bacteria, nutrients, and BOD in addition to heavy metal contaminated sediments will temporarily further degrade

downstream water quality during construction. Fish in these areas, especially less pollution tolerant species which feed primarily by sight such as sunfish, will be displaced to areas less affected by construction or will suffer from lack of ability to find food. Some fish and macroinvertebrates may also suffer gill clogging or abrasion due to high concentrations of suspended sediments.

5.06 Unavoidable Long Term Impacts. Although construction of Increment I will cause unavoidable loss of some large trees, continued growth of dominant trees in the area will be encouraged by limiting the extent of clearing as much as possible and (or) by selective clearing as set forth in a Memorandum of Agreement (see Appendix B) between the levee and utility districts and the Corps of Engineers. Eventually, with changes in the extent and frequency of flooding along the river, and with a concomitant change in ground water availability due to lowering of the channel base level, the dominant woody vegetation of the lowlands will change. Trees generally suited to dryer soil will become more abundant.

5.07 The reduction of periodic flooding in bottomlands adjacent to the river may result in some loss of wildlife associated with these conditions. In particular, two large areas of brushland (approximately 200 acres of recently cleared flood plain) located along the west side of Increment I have been valuable habitat for birds such as egrets, herons, and migratory waterfowl, as well as for mammals such as nutria and beaver. Alteration of the hydrologic regime could cause these species to become permanently displaced, and some individuals may perish as a result.

5.08 Long term changes in aquatic habitat will occur. Habitat diversity will be diminished, as will the subsequent diversity of the repopulating aquatic community. Channelizing and widening of the river will alter the average flow velocity and eliminate riffles and logjams which aid in oxygenating the water. Clearing of the channel right-of-way and removal of trees also will result in slight increases in temperature. Pollutants from upstream treatment facilities will be caused to settle further downstream due to increased velocities at high flows and loss of flood plain assimilative qualities.

SECTION VI - ALTERNATIVES TO THE PROPOSED ACTION

6.01 General. The National Environmental Policy Act of 1969 requires consideration of alternatives to a proposed action. In the case of flood control projects, these alternatives can be either structural or nonstructural. A summary of the costs, benefits, and impacts of the most viable alternatives is provided in table VI-1.

NONSTRUCTURAL ALTERNATIVES

6.02 No Action. No action would consist only of normal maintenance of existing levees and channel clearing (the previously initiated Increment I channel construction would be discontinued). This alternative would fail to help meet goals of the overall authorized project, which would allow discharge from Lake Lavon at 5,000 cfs and to protect agricultural lands from flooding. Until Increment II is constructed, releases from Lavon will be based on a maximum of 2,000 cfs at the Crandall gage (except in circumstances where public health and safety and safety of the dam require otherwise). It would commit the region to continued periods of flooding which cause estimated average annual agricultural damages of \$120,200. The agricultural potential of the land would not be realized because of the danger of reduced or lost crop production. Additionally, capital investments which have been made to date would be lost, essentially wasting those resources. These investments include not only \$2,856,000 expended by the Federal Government but expenditures by others. As part of the commitments by local sponsors, bridge construction has been completed at Farm to Market Road 3039 and at the Trinity Valley Ranch crossing at Sand Hill. Such commitments and construction have cost Trinity Valley Ranch \$33,000 and the State of Texas \$274,000. Without the completion of at least the channelization portion of the project, returns from these investments will not be realized. Thus, \$3,376,000 has been expended on the project which would be lost.

6.03 Flood Plain Regulation. Flood plain regulation or flood plain management would not cause any of the adverse impacts associated with the project but would provide no protection from floods and would reduce the agricultural productivity of the area. Further, the previous investment of \$3,376,000 would be lost.

6.04 Flood Warning System. Flood warning and forecasting are of primary value in urban areas to allow residents and business owners sufficient time to prepare. Its value in agricultural areas is limited except for accelerating harvests due to flood forecasts, a situation which is not often possible.

6.05 Flood Plain Purchase and Relocation. While purchase and relocation may be a permanent solution to the flooding problem, it removes agricultural land from production. Discussions with various agricultural lending organizations indicated the land in the project area (Increment I) has an average value of \$1,000 per acre. To purchase the area which would be protected (15,031 acres) would

TABLE VI-1

SUMMARY OF EFFECTS ASSOCIATED WITH EACH ALTERNATIVE

	No Action	Increment I Channel Construction Only	Increment I Levee Modification Only	Lavon Modification & East Fork Channel Improvement Project	Increment I Levee and Channel (Authorized)
Project cost (first cost)	0	\$10,605,000	\$9,136,000	\$66,579,000	\$11,370,000
Use of previous expenditures	0	100%	0	100%	0
Benefits (annual)	0	\$108,600	\$197,900	\$4,024,900	\$236,800
Fulfill commitments	None	Partial	Minimal	Complete	Complete
Benefit to Lavon Lake discharge rate	None	Good	None	Good	Good
Benefit-to-cost ratio	-	0.27	0.58	1.40	0.55
Temporary ecological impacts of construction					
Terrestrial habitat	None	Severe	Minimal	Severe	Severe
Terrestrial wildlife	None	Moderate	Minimal	Moderate	Moderate
Vegetation	None	Moderate	Minimal	Moderate	Moderate
Aquatic wildlife	None	Severe	None	Severe	Severe
Temporary ecological impacts of operation					
Terrestrial habitat	None	Moderate	None	Moderate	Moderate
Terrestrial wildlife	None	Moderate	None	Moderate	Moderate
Vegetation	None	Moderate	None	Moderate	Moderate
Aquatic wildlife	None	Severe	None	Severe	Severe
Temporary social economic impacts					
Aesthetics	None	Moderate	Minimal	Severe	Severe
Air quality	None	Moderate	Minimal	Moderate	Moderate
Noise levels	None	Moderate	Minimal	Moderate	Moderate
Recreation use	None	Minimal	Beneficial	Minimal	Minimal
Agriculture and cattle productivity	None	Good	Minimal	Good	Good
Use of resources	Poor	Fair	Poor	Good	Good
Impact to archeological/historical resources	None	None	Moderate	Minimal	Minimal

cost an estimated \$15,031,000. When this amount is added to the \$3,376,000 already invested and from which no return could be expected, the initial economic cost would be \$17,407,000. Agricultural production would be curtailed as long as the area remained regulated for nonflood damage use, thus resulting in a yearly economic loss from agriculture. This loss might be partially offset by other uses, but the economic value of such alternative uses is questionable at this time.

STRUCTURAL ALTERNATIVES

- * 6.06 Reservoirs. Two major reservoirs presently exist upstream from the combined Increments I and II channel improvement area, Lake Ray Hubbard and Lake Lavon. One of the purposes of the proposed channel improvement project is to eventually allow greater flexibility in the operation of Lake Lavon and thereby provide 50 year level of protection by permitting releases of up to 5,000 cfs which would remain in-channel and cause no inundation related damages to lands adjacent to the channel. Damage free releases at 5,000 cfs would be possible only if the channel of both Increments I and II were improved since Increment II has some channel constrictions that now only pass up to 2,000 cfs without overbank flooding. (The Lavon project has the design capacity to pass up to 359,000 cfs should such an event be necessary.) There is no apparent justification for another upstream impoundment for flood control, as the flood damages are not of sufficient magnitude to warrant consideration of this alternative.
- 6.07 Channel Construction Only. Construction of a channel throughout Increment I is a practicable alternative to the proposed project of channel and levees, especially since channel construction has been initiated and 10 percent of the channel construction is complete. Such an alternative would call for the construction of a channel along the originally planned right-of-way with the original configuration. The construction of a channel would reduce average annual flood damages within the leveed area by an estimated \$108,600; however, it would forego the added annual benefits of \$128,200 which could be obtained by an expenditure of \$765,000 for levee improvements.
- 6.08 The ecological impacts of the project would be essentially the same as for the channelized portion of the proposed project. Because the majority of the construction will take place along the channel right-of-way, impacts resulting from air and noise pollution will be more restricted than alternatives involving levee modification.
- 6.09 Levee Modification. The levee modification alternative only partially fulfills the desired goals of the Increment I project since interior drainage is not improved and hillside drainage behind the levees would continue to cause losses. Under such a system, levees would be strengthened and raised to an average height of 14.6 feet,

and no channelization would be undertaken. Levee construction would result in moderate flood control benefits through reduction of flood damage to agricultural lands protected by the levee. Such work would be less expensive, requiring approximately \$9,136,000 to complete as opposed to \$11,370,000 for levee-channel alternative. Estimated benefits would be significantly lower - \$197,900 on an average annual basis. This is 80 percent of the estimated benefits of the levee-channel combination.

6.10 Environmental impacts resulting from levee work would be relatively low as compared to the levee-channel concept, although additional land would have to be taken (and therefore impacted) in the form of "borrow ditches." Construction of a levee would eliminate the need to disturb the aquatic environment of the river and would be beneficial, as it would create ponds suitable for fish and wildlife adjacent to the levee.

6.11 Expenditures previously committed by the state and local landowners would have no appreciable return. Previous bridge construction amounting to approximately \$307,000 would have to be considered as unnecessary. The previous channelization work would have little effect, and the \$2,856,000 in Federal funds expended must be considered as an economic loss. Agreements between the Federal Government and landowners and levee districts would not be fulfilled, and continued flooding would result in average annual agricultural damages of \$120,200. As the alternative would create considerable impact to "borrow areas" near the levee, known archeological and historical resources of the area would have to be salvaged. Finally, the levee concept alone would not further the fulfilling of the goals of the overall authorized project, as discharge rates from Lake Lavon would permanently remain restricted to a maximum of 2,000 cfs, thus reducing the effectiveness of the reservoir in flood control and preventing the levee sluice gates from opening properly.

6.12 Levee-Channel Combination. For Increment I to completely fulfill its share of the goals of the overall authorized project, it was determined that a levee-channel combination would be required to supplement the existing Lavon Dam. The channel would be sized to allow the sluice gates in the levees to operate while there was 5,000 cfs flowing in the channel, thus preventing ponding damage behind the levees. By increasing channel capacity and conveyance, floodwaters could recede more swiftly. Earth removed during channel construction could effectively be utilized to raise and strengthen the existing levees. Considering all these factors, as well as economic, environmental, and social impacts which would accrue, this Increment I project was selected for implementation.

SECTION VII - THE RELATIONSHIP BETWEEN LOCAL SHORT TERM USES OF
MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT
OF LONG TERM PRODUCTIVITY

7.01 This section provides an assessment of the tradeoffs between short term environmental gains and losses versus long term changes in regional productivity. The construction of the East Fork Trinity River channel will remove 37 acres of river bottom woodland along the right-of-way, but by Memorandum of Agreement between the levee districts and the Corps of Engineers, all remaining woodlands between the East Fork and the levees will be protected from clearing for the life of the project. Approximately 4 miles of river habitat and its associated productivity also will be reduced, and the hydrology and ecosystems of 2 miles of oxbows will be altered.

7.02 The major long term gain in productivity will accrue from the reduction of floods to 15,031 acres of agricultural land protected by the levees. In addition, the productivity of other lands within the flood plain will be enhanced by improved drainage. Currently, 80 acres outside the levees are under cultivation. Better flood control and a lowered river base level may result in expansion of cultivation areas. Pastureland located primarily in the southern portion of the project area is currently estimated to be 673 acres. With improved hydrological conditions, these areas are likely to become enlarged as locations subject to inundation are reduced. One of the largest land use changes may result from the alteration of hydrology of several areas located along the west side of the East Fork Trinity River. Channel construction and right-of-way clearing for channel and levee modification will result in a total of approximately 450 acres of bottomland becoming available for cattle grazing. Based on the carrying capacity of grazing land in the area west of the river, this acreage will support approximately 150 head of cattle. Levee modifications will result in increased agricultural livestock production on lands to the east of the East Fork river bottom. Such strengthening and modifications in conjunction with channel construction are expected to increase agricultural productivity and reduce annual agricultural flood damages by approximately \$181,800.

SECTION VIII - ANY IRREVERSIBLE AND IRRETRIEVABLE
COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED
IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

8.01 All natural and human resources affected by the proposed project have been investigated to determine if their involvement represents an irreversible or irretrievable commitment. The area itself is a testimony to the healing capacity of nature in that the proposed project is a rehabilitation and expansion of a similar project undertaken some 70-80 years ago. Therefore, it is believed that none of the terrestrial or aquatic natural elements will be lost for all time.

8.02 Continuation of the project will commit the Federal Government to an expenditure of approximately \$6,600,000 for channel construction and levee modification. Manpower resources to be expended during this work will involve approximately 50 individuals and will commit the expenditure of approximately \$29,000 to \$40,000 payroll monthly. A commitment of funds for payroll will result only indirectly in a loss of resources as they become redistributed to other sources.

8.03 Channel construction and transport of excavated material will utilize approximately 2,300 to 3,100 gallons of diesel fuel (personal communication with Dahlstrom Corporation) and approximately 50 gallons of gasoline per day. Materials used for construction of the channel and levee modifications will include hundreds of tons of rock riprap material and approximately 400 pounds of fertilizer per acre (for revegetation) as well as other materials such as lumber and concrete.

8.04 After completion of the channel construction and levee modification, maintenance of the project site (channel and levees) will commit additional expenditures of personnel, fuel, and machinery to maintain the improvements for the life of the project.

BIBLIOGRAPHY

- Coastal Ecosystems Management, Inc. Investigation of Soil/Sediment Quality in the East Fork of the Trinity River. Prepared for Fort Worth District, Corps of Engineers, Contract No. DACW63-76-M-0729, 1 April 1976.
- Correll, D. S. and M. C. Johnston. 1970. Manual of the Vascular Plants of Texas. Texas Research Foundation, Renner, Texas. 1881 pp.
- Davis, W. B. 1974. The Mammals of Texas. Texas Parks and Wildlife Department, Bulletin No. 41, Austin, Texas. 294 pp.
- Fullwood, Percy D. 1950. A Survey of the Parasitic Copepods Infesting Fish in Dallas County, Texas. Thesis presented to Southern Methodist University.
- Howell, Steven and Michael A. Collins. August 1976. Effects of Stream Geometry in Stream Quality Modeling: A Case Study of the East Fork of the Trinity River. Southern Methodist University. 46 pp.
- Mackenthun, K. M. 1973. Toward a Cleaner Aquatic Environment. Environmental Protection Agency, Washington, DC.
- Raun, G. G. and F. R. Gehlbach. 1972. Amphibians and Reptiles in Texas: Taxonomic Synopsis, Bibliography, County Distribution Maps. The Dallas Museum of Natural History, Bulletin 2. Dallas, Texas. 132 pp.
- Robbins, C. S., B. Braun, H. S. Zim, and A. Singer. 1966. Birds of North America: A Guide to Field Identification. Golden Press, New York. Western Publishing Company, Inc., Racine, Wisconsin. 340 pp.
- Texas Water Quality Board. June 1971. Dallas/Fort Worth Area Steady-state Modeling Reports East Fork of the Trinity River from Forney Dam to Confluence - Setment 0819. Austin, Texas. 28 pp.
- US Department of the Interior, Fish and Wildlife Service. Wednesday, October 27, 1976. Endangered and Threatened Wildlife and Plants, Republication of the List of Species. Volume 41, No. 208, Part IV. Published by the Office of the Federal Register, National Archives and Records Service, General Services Administration, Washington, DC. pp. 47179-47198.

US Department of the Interior, Fish and Wildlife Service. Tuesday, July 1, 1975. Threatened or Endangered Fauna or Flora, Review of Status of Vascular Plants and Determination of "Critical Habitat." Federal Register, Volume 40, No. 127, Part V. Published by the Office of the Federal Register, National Archives and Records Service, General Services Administration, Washington, DC. pp. 27823-27924.

The University of Texas at Austin. 1974. Rare and Endangered Plants Native to Texas. University of Texas Rare Plant Study Center, Austin, Texas. 13 pp.

SECTION IX - COORDINATION, COMMENT, AND RESPONSE

9.01 General. The draft supplemental environmental statement for the Lavon Dam and Reservoir Modification and East Fork Channel Improvement - Increment I was filed with the Environmental Protection Agency on 15 February 1978 and noticed in the Federal Register, Volume 43, Number 38, February 24, 1978, page 7700. Public notice of availability of the draft supplement was mailed to 48 news media organizations on 21 February 1978.

9.02 Revisions to the Draft Supplement. A number of comments were received in coordination of the draft supplement relating to the project's effects on long term water quality in the East Fork of the Trinity River and their relationship to ongoing sewage treatment plant point source effluent improvements upstream and Section 208 planning (PL 92-500, as amended). The North Central Texas Council of Governments, acting through the Texas Department of Water Resources, formulated a steady-state water quality model of the East Fork from Forney Dam to the confluence with the Trinity River. Using this expanded and refined model, several water quality predictive runs were made in July and August of 1978 based on the channel changes which would occur with the proposed project. These runs and interpretations are now included on page A-I-28 of appendix A and tables 7 and 8. Changes were made in paragraph 4.07 to reflect these predictive changes. For informational purposes, Appendix B - Memorandum of Agreement, Appendix C - Letters of Local Assurances, and Appendix D - Section 404(b) Evaluation Report have been included in the final supplement.

9.03 Comment and Response. Copies of the draft supplemental environmental statement were sent to 80 Federal, State, and local agencies, groups and organizations, and interested individuals for review. They were asked to comment on the accuracy and adequacy of information contained in the document. Comments received have been reviewed and evaluated and, where applicable, incorporated into this final supplemental environmental statement. Copies of letters received with responses are presented on the following pages. Table IX-1 indexes the particular agencies for ease in finding their correspondence.

TABLE IX-1
COMMENT AND RESPONSE

<u>COMMENTOR</u>	<u>RESPONSE</u>
<u>FEDERAL</u>	
Environmental Protection Agency	IX-3
USDA, Soil Conservation Service	IX-7
DOT, Federal Railroad Administration	IX-8
USDI, Office of the Secretary	IX-9
Department of Health, Education and Welfare	IX-13
Department of Energy	IX-14
<u>STATE & LOCAL</u>	
Office of the Governor	IX-15
Texas Department of Water Resources	IX-16
Texas State Soil and Water Conservation Board	IX-21
Texas Air Control Board	IX-24
Texas Department of Health	IX-25
State Department of Highways and Public Transportation	IX-27
General Land Office	IX-28
Texas Forest Service	IX-29
Texas Parks and Wildlife Department	IX-31
Texas Historical Commission	IX-34
North Central Texas Council of Governments	IX-38
City of Mesquite	IX-43
<u>OTHER</u>	
Sierra Club	IX-45
League of Women Voters	IX-47
National Wildlife Federation	IX-49
Texas Committee on Natural Resources	IX-51
Flying A Ranch	IX-56



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
FIRST INTERNATIONAL BUILDING
1201 ELM STREET
DALLAS, TEXAS 75270

April 5, 1978

Colonel John F. Wall
U.S. Army Engineer District
P.O. Box 17300
Fort Worth, Texas 76102

Dear Colonel Wall:

The Environmental Protection Agency has received the Draft Supplement to the Environmental Statement for Increment 1 - Channel and Levee Improvement East Fork Trinity River, Kaufman County, Texas.

We regret that we will be unable to respond within the established review period. We expect to respond by April 24, 1978. Please accept our apologies for this delay.

Sincerely,

W. H. Spotts
William H. Spotts
Regional EIS Coordinator (GASAF)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

FIRST INTERNATIONAL BUILDING
1201 ELM STREET
DALLAS, TEXAS 75202

April 27, 1978

Colonel Harvey D. Hodges
LTC, CE
Deputy District Engineer
Department of the Army
Fort Worth District
Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102

Dear Colonel Hodges:

We have reviewed the Draft Supplement of the Final Environmental Statement regarding Increment I of the East Fort Channel and Levee Improvement project portion of the authorized Lavon Lake Modification and East Fort Channel Improvement project for local flood protection along the lower reach of the East Fort of the Trinity River, Kaufman County. The authorized plan of improvement for the East Fort consists of widening, deepening, and realigning the existing 31.8 mile long channel, and strengthening and raising about 38.3 miles of existing levees in six separate levee districts. The plan also calls for the replacement or modification of railroad or highway and county road bridges crossing the channel, and the relocation and alteration of existing gas and power lines within the project limits.

The proposed action for channel construction and levee modification work for Increment I will be conducted in two phases. Phase I consists of vegetation clearing of the remaining portions of the channel right-of-way and areas in proximity to the riverside toe of the levees where the 4.5 million cubic yards of excavated material will be placed behind dikes for drying and the actual construction of the channel. The channel configuration will be generally trapezoidal with 80 feet bottom width and 1 vertical on 3 horizontal side slopes. The average depth of the excavated channel will be about 18 feet. Minimum channel capacity will be about 5,000 cfs below damage levels when complete, with bank-full capacity of about 11,500 cfs.

Phase II, the levee modifications, will commence approximately two years after Phase I has been completed and will consist of strengthening and raising existing levees. The top grades of the improved levees will be established to a minimum distance of two feet above the design water surface for 54,000 cfs at the upper end of the Increment I project area and 60,000 cfs at the East Fort mouth. This levee height will contain floods with a 50-year recurrence interval. Interior drainage will be provided through sluice structures, some of which will be riprapped.

In order to evaluate fully the environmental impacts of the project, we suggest the following comments be considered in the preparation of the Final Environmental Impact Statement:

- (1) The Final EIS should give more details on the coordination efforts with the City of Dallas and with land use plans such as the 208 plan for the area.
- (2) The Draft EIS assumes more stringent levels of wastewater treatment will be forthcoming on the East Fork which will improve water quality so the aquatic habitat of the new stream, should become suitably diversified. The Final EIS should address the possibility that more stringent levels of treatment may not be required by the Texas Department of Water Resources.
- (3) A land use map should be included in the Final EIS showing the location of the 3,000 acres of bottomland found in the project area, along with an estimate of the number of acres of wetlands in the project, also showing their location. Assurance should be given that the project will be in accordance with the EPA published regulations of September 5, 1975 for discharge of dredged or fill material in navigable waters (40 CFR 230), laws and regulations pursuant to Section 404 of the Federal Water Pollution Control Act as amended, and guidelines of Executive Order 11990.

These comments classify your Draft Supplement to the Final Environmental Impact Statement as LO-2. Specifically, we have no objection to the project; however, we are requesting more information regarding cooperation with the City of Dallas and land use plans. We are also concerned with levels of waste water treatment and compliance with applicable laws and regulations. The classification and a summary of our comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions, under Section 309 of the Clean Air Act.

Definitions of the categories are provided on the enclosure. Our procedure is to categorize the EIS on both the environmental consequences of the proposed action and on the adequacy of the Impact Statement at the draft stage, whenever possible.

(1) At the East Fork 404 Permit Public Meeting on 23 February 1977, Mr. I. M. Rice, Director of the Dallas Water Utilitics, who has charge of the operation of the Dallas owned Lake Ray Hubbard, heartily endorsed and encouraged the Corps of Engineers to go forward with flood control measures on that portion of the East Fork below Lake Ray Hubbard. He expanded on the lack of flood control in Lake Ray Hubbard but discussed how the City of Dallas coordinated the operation of their lake with the operation of Lake Levon to reduce damaging effects of a heavy rainfall period in 1971. He noted that urban expansion in the watershed both above and below Lakes Levon and Ray Hubbard are causing increasing flooding problems in the lower East Fork and that assistance to landowners there is needed. Land use plans examined are referenced in Section III. The effect of the proposed project on the 208 plan for the area has been discussed with the North Central Texas Council of Governments and taken into account in assessing impacts.

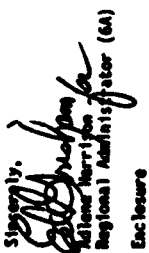
(2) The assumption that there is a good probability of the East Fork attaining a better diversity of flora and fauna with the channel and levee improvement project is based on the removal of polluted sediments and soils and the flowing of better quality effluent from the new Garland Duck Creek Sewage Treatment Plant. The better substrate and the cleaner water will help reduce the introduction of pesticides and heavy metals into the food web by bottom dwelling organisms which feed from the sediments. We are aware of the Texas State water pollution control agency rescinding its order to require 5/5/3 treatment in order to evaluate the effectiveness of 10/15 treatment requirement.

(3) As shown in Table 12 on page A-1-49 there are nearly 3,000 acres of woodland with a total bottomland of nearly 4,500 acres. There are about 22 acres of pooled waters, about half of which are located on both sides of the two bridges crossing the project. The other half of the continuously wet area can be found immediately adjacent to and for most of the length of the levees (borrow areas) and river cutoffs. Figure 2 shows the cleared area and the drainage way at the toe of levee K-4.

Each of the factors for evaluation of physical and chemical-biological interactive effects on water quality and general considerations and objectives for evaluating discharges of dredged or fill material in 40 CFR 230 has been included in various paragraphs of the supplement to the impact statement, including various alternatives and construction methods to achieve the project purposes. Studies of contaminated materials in the East Fork and appropriate precautions have been proposed to dispose of these materials in such a manner as to prevent leaching or erosion of these materials from their disposal sites. The project will involve work in the previously mentioned wetlands in that the channel will be dug through the areas adjacent to the bridges and the excavated materials will be placed in the borrow areas at the toe of the levees. As regards the guidelines of EO 11990 the Corps has studied an array of alternatives and found the proposed project to be the most feasible. The proposed plan was presented to the public under full disclosure and consideration was given to public health, safety, welfare, pollution, flood and storm hazard, sediment and erosion, maintenance of natural systems and other uses of the areas. All these factors were considered in making the final decision on the project. A section 404 evaluation report has been included as Appendix D, which details those factors included in 40 CFR 230.

We appreciate the opportunity to review the Draft Supplement to the Final Environmental Impact Statement. Please send our office two copies of the Final Environmental Impact Statement at the same time it is sent to the Office of Federal Activities, U. S. Environmental Protection Agency, Washington, D. C.

Sincerely,


Adlene Harrison
Regional Administrator (GA)

Enclosure

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

P. O. Box 648
Temple, TX 76501

No response.

February 27, 1978

Mr. Harvey D. Hodges
Deputy District Engineer
Department of the Army
Corps of Engineers
P. O. Box 17300
Fort Worth, TX 76102

Dear Mr. Hodges:

We have reviewed the draft supplement of the final environmental statement regarding Increment 1 of the East Fort Channel and Levee Improvement project portion for the lower reach of the East Fork of the Trinity River, Kaufman County, Texas and feel that the statement, as written, adequately reflects the impacts this project will have on the soil, water, and plant resources.

We appreciate the opportunity of reviewing this draft supplement.

Sincerely,

Ernest Shillingburg

George C. Marks
State Conservationist



DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
819 Taylor Street - Room 11A23
Fort Worth, Texas 76102

SECTION FOUR
Fort Worth, Texas

March 17, 1978

Harvey D. Hodges
LTC, CE
Deputy District Engineer
Department of the Army
Corps of Engineers
P. O. Box 17300
Fort Worth, Texas 76102

Dear Colonel Hodges:

This is in reference to your request for comments on the draft supplement to the Environmental Statement for Lavon Dam and Reservoir.

The proposed work includes protective works and the replacement of timber pilings in seven bents in the T&M Railway bridge. You should be advised that this rail line is pending abandonment before the ICC. Should the abandonment be allowed, any expenditures on this bridge would be wasted. Consequently, we suggest you request the ICC to make you a party to the proceedings. In this way, you can be kept informed on the progress of this case and its final disposition so that Federal funds are not unnecessarily expended.

Sincerely,


Jeremy J. Coleman, P.E.
Director of Federal Assistance

The proposal to abandon the T&M rail line is noted. All work in Increment 1 is below T&M bridge.



United States Department of the Interior

OFFICE OF THE SECRETARY

SOUTHWEST REGION

POST OFFICE BOX 208

ALBUQUERQUE, NEW MEXICO 87103

ER-74/159

APR 4 1978

Lieutenant Colonel Harvey D. Hodges
Corps of Engineers
Attention: SWED-PR
Post Office Box 17300
Fort Worth, Texas 76102

Dear Colonel Hodges:

The Department of the Interior has reviewed the draft supplement to the final environmental statement for Lavon Dam and Reservoir Modification and East Fork Channel Improvement, Kaufman County, Texas, and offer the following comments.

Preface

- (1) On page 2, it is noted that the benefit-cost ratio of increment 1 is less than 1.0-1.0. Later the data shows the ratio is 0.55-1.0. The discussion does not indicate that increment 1 is a necessary and integral part of Lavon Reservoir enlargement nor that it is necessary for previous work to be successful. It only shows that increment 1 does not reduce the overall benefit-cost ratio below 1.0-1.0. We suggest a brief explanation for continuing with increment 1 in the face of unfavorable economic information as presented in the draft supplement.

Project Description

- (2) Page 1-2 - The first full sentence only states that bankfull capacity of the completed channel will be about 11,500 cubic feet per second. Other parts of the sentence indicate that additional information should have been included in this sentence.
- (3) Page 1-5, Figure 3 - If this is a schematic of the elevation relationships, we suggest it be labeled schematic. If elevations are presented as actual elevations, we have difficulty correlating the elevation of 315 for the existing mouth of the stream with the 337 elevation given in Appendix A-1 on page A-1-1. This should be clarified.
- (4) Page 1-4, Figure 2 - Also Page IV-1 Paragraph 4.02, Page IV-2 Paragraph 4.06. These paragraphs should be checked for clarity of correlations of elevations, drops, and changes.

- (1) The local sponsors have committed resources to the project and the Corps of Engineers recommends continuing the project in good faith even though the incremental benefit-cost ratio is less than 1.0 for increment 1. The final decision rests with Congress since the Corps has testified that the incremental benefit-cost ratio is less than 1.0. The benefit-cost ratio for the total authorized project remains viable at 1.40.

- (2) The sentence has been rewritten for added clarity.

- (3) Figure 3 has been revised to reflect refined data. Elevation 315 msl is now 310 msl which is the elevation of the streambed at the confluence. Elevation 337 msl is the elevation of the flood plain in the area of the confluence.

- (4) Paragraphs 4.02 and 4.06 have been changed to make elevation change values more correct.

- (5) Page IV-1, Paragraph 4.03, and Page IV-2, Paragraph 4.07 - These two paragraphs indicate that the project will increase pollution problems in a stream which is currently an "effluent dominated stream." The statement contains no discussion as to how this project will be kept in compliance with Section 404 of the Federal Water Pollution Control Act.
- (6) The East Fork of the Trinity has the physical potential to support a good sport fishery. The project will destroy that potential for the length of the proposed channel and could eventually cause the loss of the remaining stream as far upstream as Lake Hubbard. This should be recognized in the statement.
- (7) Page IV-4, Paragraph 4.14 - We believe the cumulative effects on habitat and wildlife along the 10.8 miles of stream should be discussed here rather than the effects on 4,000 linear feet.
- (8) Page IV-7, Paragraph 4.26 - No area of flood protection has been given. We suggest the first sentence should be extended to read something like, "... losses will be significantly reduced on 00,000 acres of land."
- (9) A table (similar in form to Table VI-1) could be used to summarize physical characteristics for each increment of the plan. Such a table would clarify some of the data that has been presented.
- (10) Page IV-8, Paragraph 4.31 - The final environmental statement should contain information regarding the archeological field investigations mentioned. Specifically, the final statement should include the name of the archeologist who conducted the survey, the institution he/she represents, and the dates the work was accomplished. In addition, there should be assurance that the entire area to be affected by the project has been archeologically surveyed.
- Any Probable Adverse Environmental Effects Which Cannot Be Avoided
- (11) Page V-2, Paragraph 5.06 - We believe this section should further discuss remedial, protective, and mitigative measures. Some serious impacts on fish and wildlife resources have been identified. We do not believe there is adequate discussion for potential mitigation of these losses in this section or elsewhere in the statement.
- (12) In this paragraph, mention is made of a Memorandum of Understanding between the Corps of Engineers and the project sponsors concerning protection of existing timber. Close review indicates the agreement contains no penalties for violations and, therefore, enforcement would depend upon voluntary compliance. Without voluntary compliance, there would be no compensation for fish and wildlife resource losses. This situation should be recognized in the statement.

- (5) The disposal sites for discharge of dredged or fill material required with construction of the project have been specified in compliance with Section 404(b) of P.L. 92-500, as amended, and through application of EIS guidelines contained in 40 CFR 230. The changed channel morphology will not result in an increase in long-term water quality problems as discussed in responses to comments of the North Central Texas Council of Governments. Paragraph 1.06 and several paragraphs in Section IV and V describe the plan to reduce erosion in the construction.
- (6) It is recognized in the statement that degradation will occur to physical habitat for certain sport species. At present and for the projected future without the project, water quality, not physical habitat, is the limiting factor for sport fisheries. Water quality modeling efforts (see App. I) indicate DO levels above stream standards with the project. With increased DO levels in areas where DO was previously limiting in combination with degradation of habitat, the sport fishery could shift, initially, to species without specific physical habitat requirements (i.e. white bass). Channel fisheries improvements, as mentioned in the Texas Parks and Wildlife letter of comments, could then be installed to redevelop that potential.
- (7) The 4,000 linear feet of woodlands are additional to the approximate 47,638 linear feet cleared under the 1972 contract for project construction. Because of the extreme density of much of the woodlands, it is believed that the created "edge effect" will aid in increasing diversity of plant and animal species and will somewhat offset the loss of woodland habitat.
- (8) Paragraph 4.26 has been rewritten to provide information pertinent to Increment I.
- (9) Figure 1 on page I-3 is a aerial photo showing physical aspects of project and related adjacent areas, Figure 2 on page I-4 gives topographical construction aspects and Figure 3 on page I-5 gives pertinent data on construction aspects of the project. It would be difficult to put all this information in a Table.
- (10) Mr. Jeffery J. Michner of the Archaeology Research Program at Southern Methodist University, Dallas, Texas conducted and reported on "An Archaeological Survey of Areas to be Affected by the East Fork Channel and Levee Improvement Project Dallas and Kaufman Counties, Texas" under contract EMC-76-369. The report described an archeological survey of 29 miles of the East Fork. Twelve pre-historic sites were discovered, two of which were in the Increment I portion of the project.
- (11) In an effort to not be redundant we did not rediscuss the mixed gross seeding of construction scarred lands, the plugging of the ends of oxbows to create additional wetlands, the inevitable production of valuable forbs in disturbed areas, the increased "edge" along the perimeter of the nearly 2,430 acres of dense bottomland woodland which will be protected by the Memorandum of Agreement, the improved quality of the substrate of the improved channel which, in conjunction with better quality of water from the Garland Truck Creek Sewage Treatment Plant, will help develop the potential for a higher quality stream fishery and the "potholes" which will be left in the improved stream because of imperfect construction techniques and the general willingness of landowners to share their lands with a variety of game and non-game animals.
- (12) The Corps believes that the Memorandum of Agreement (copy of which is in Appendix B) is just as binding as the Letters of Assurances (copies of which are in Appendix C). There are methods which encourage compliance with signed formal agreements.

Alternatives to the Proposed Action

3

- (13) Page VI-3, Paragraph 6.09 - This paragraph implies that levee modification alone cannot fulfill the "desired goal" of interior drainage. It does not discuss potential additional drainage modifications in conjunction with strengthened levees. The additional costs of drainage features, such as pumps, should be weighed against the alternative loss of the flood plain values, including the absorptive effects of the wetlands which would be destroyed by the channel.

The Relationship Between Local Short Term Uses of Man's Environment and the Maintenance and Enhancement of Long Term Productivity

- (14) We believe this section should be expanded. The potential future damages to fish and wildlife resources could be discussed here. Such project induced future changes include but are not limited to the following:

1. Completion of Increment I will require the eventual construction of Increment II if the former project is to meet all of its "goals" as stated in the discussion of alternatives. The Fort Worth District Engineer has stated that the full 5,000 cubic feet per second releases from Lavon Lake will not be initiated until measures to control flooding in Increment II are in effect.
2. The reduced wetland absorptive qualities of the East Fork Flood plain may well create a demand for further flood control measures on the main stem of the Trinity River.
3. Although the flood measures proposed are essentially agricultural in nature, the project impacts with regard to E.O. 11988, Flood Plain Management, should be discussed. The close proximity of this project to the rapidly expanding Fort Worth-Dallas metropolitan increases the likelihood that any increase in flood plain protection could stimulate urban development on the East Fork.

Any Irreversible and Irrevocable Commitments of Resources

- (15) It is stated that natural resources will not be irreversibly committed by this project. It would appear that based on the potential for future changes to the area as discussed above that natural resources may be irreversibly committed. We believe this should be recognized in the statement.

Appendix

- (16) Page A-1-49 - The Cultural Setting section of the final statement should include evidence of review by the State Historic Preservation Officer and comments furnished by the officer relative to the impact

- (13) The additional cost of pumps were considered but the initial cost and annual operation and maintenance cost made them one of the least feasible alternatives and were therefore dismissed early in the alternative selecting process. With the ground water level so near the surface, as witnessed in the borrow ditches never going dry, the absorptive ability of the flood plain can be deduced to be rather low. With the increased flow rate of about one-half hour in increment I the flood plain will still have plenty of opportunity to absorb flood waters to its capacity. With the project its absorptive capacity may increase because of locally lowered ground water level. This is discussed in paragraph 4.09.

- (14) 1. True.

2. This is being taken into consideration in the planning of the Trinity River Project.

The Corps has made a study of alternative ways of accomplishing the objective of protecting agricultural lands from floods on the East Fork. The public has been informed that the selected plan of improvement will involve work in the flood plain and the work will cause certain beneficial and adverse impacts.

3. The environmental setting section talks extensively of the flood plain in which the proposed work is to be conducted. The alternative methods of accomplishing the desired goals are discussed in Section VI and the protecting of from 2430 acres to 2975.5 acres of bottomland hardwoods from clearing, the creating of permanent orbow impoundments and extensive erosion control measures are ways that will minimize potential harm to be caused by project construction. The proposed project has been brought to the public's attention at a public hearing held at Wylie, Texas, on 22 January 1958; the final environmental statement Lavon Dam and Reservoir Modification and East Fork Channel Improvement - filed with CEQ on 29 March 1971; the 404 public meeting held in Kaufman, Texas on 23 February 1977; and the draft supplement to the final environmental statement filed with CEQ on 24 February 1978. All of these coordination efforts have been given widespread exposure. The alternative of flood plain management or regulation was given due consideration and dismissed as not providing the needed structural advantage for draining the land side of the levee. All of the above information is contained in the Supplement and satisfies the requirements of EO 11988. Our experience has been that urban development will take place in a flood plain with or without flood plain protection. Many people are not concerned until their property gets flooded, then they ask for help.

- (15) The natural resources of the area will be irreversibly committed by this project only if complete development occurs as a direct result of construction. While the potential exists for future urban development, this would likely occur also in the absence of the project. The area is now rural agricultural and only 50 year frequency protection is to be provided. Nature, given the chance, can restore natural resources directly disturbed by the project in a relatively short time.

- (16) The State Historic Preservation Officer's comments are contained on page IX-37.

of the project upon properties on or eligible for inclusion in the National Register of Historic Places. He is Mr. Truett Latimer, Executive Director, Texas Historical Commission, Post Office Box 12276, Capitol Station, Austin, Texas 78711.

We appreciate the opportunity to review this statement.

Sincerely yours,

Raymond P. Churan
Raymond P. Churan
Regional Environmental Officer



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
ATLANTA, GEORGIA 30333
Telephone (404) 528-1111

April 14, 1978

Lt. Colonel Harvey D. Hodges
Deputy District Engineer
Fort Worth District
Corps of Engineers
Department of the Army
P.O. Box 17300
Fort Worth, Texas 76102

Dear Colonel Hodges:

We are responding to the Draft Supplement to the Environmental Statement for the Laron Dam and Reservoir Modification and East Fort Channel Improvement on behalf of the Public Health Service.

Our review of this statement indicates that the impact of potential vector-borne disease have been adequately addressed. The fact that St. Louis and Western equine encephalitis cases have been reported from this area is recognized, and the impacts on vector mosquito production are assessed.

We appreciate the opportunity to have reviewed this statement.

Sincerely yours,

William H. Foege

William H. Foege, M.D.
Assistant Surgeon General
Director

No response.



DEPARTMENT OF ENERGY
REGION IV
DALLAS, TEXAS

MAR 20 1978

P. O. BOX 17300
FORT WORTH, TEXAS 76102

Harvey D. Hodges, LTC, CE
Deputy District Engineer
Department of the Army
Fort Worth District, Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102

Dear Colonel Hodges:

We have reviewed the Draft Supplement to Environmental Statement for
Lavaa Dam and Reservoir Modification and East Fort Channel Improvement
and have the following comment.

We believe the draft environmental statement adequately quantifies the
socio-economic benefits of the proposed project, but that it should also
quantify some of the possible detrimental socio-economic aspects of the
project.

Sincerely,

Artis E. Carlson, Jr.
Artis E. Carlson, Jr.
Acting Regional Representative

There are some conjectural detrimental socio-economic aspects of the pro-
ject. Probably the least detrimental will be the increased pumping cost
to those few area residents who utilize ground water. Of greater conse-
quence will be the expense of improving roads to and fences and gates
around agricultural lands which will be less likely to get inundated.
However, increased production on these lands will offset this additional
expense. The most detrimental effect could be the sudden influx of people
to the area's small communities. If this happens, the sudden growth of
community population could put a stress on public services, public facilities,
and the availability of adequate housing. Many communities have determined
how fast they would like to grow and an influx of new residents, whether
permanent or temporary, may be contrary to the rate of desirable regional
growth. These aspects are conjectural since the communities may wish to
grow and have the ability to react quickly in providing the necessary
facilities and services.

COLLINS BRIDGES
Governor



OFFICE OF THE GOVERNOR

April 12, 1978

No response.

Colonel Harvey D. Hodges
Deputy District Engineer
Department of the Army
Fort Worth District
Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102

Dear Colonel Hodges:

The Draft Supplement of the Final Environmental Statement for Levee Dam and Reservoir Modification and East Fort Channel Improvement has been reviewed by the Budget and Planning Office and interested State agencies.

The comments of the reviewing agencies are enclosed for your use and information. If this Office can be of further assistance, please contact us.

Sincerely,

Roy Hagan

Roy Hagan, Assistant Director
Budget and Planning Office

Enclosures

TEXAS DEPARTMENT OF WATER RESOURCES

TEXAS WATER DEVELOPMENT BOARD

A. L. Blair, Chairman
 Paul H. E. Galt, Secretary
 William T. Davis
 John H. Garrett
 George W. McCallister
 (John E. Brown)

DAVID WALLACE
 Director
 1000 North Loop West
 Austin, Texas 78701

March 30, 1978

March 30, 1978

Mr. Charles D. Travis, Director
 Governor's Budget & Planning Office
 700 Executive Office Building
 Austin, Texas 78701

Budget/Planning

SUBJECT: U.S. Army Corps of Engineers, Fort Worth District -- Draft Supplement to Environmental Statement -- "Laron Dam and Reservoir Modification and East Fork Channel Improvement (Pertaining to East Fork Channel and Levee Improvement Increment I)," March 29, 1978.

Dear Mr. Travis:

In response to your February 22nd memorandum, the Texas Department of Water Resources (TDWR) has reviewed the subject document which supplements and updates certain project information contained in final, updated project environmental statement of July 23, 1976, insofar as the INCREMENT I portion only of the East Fork Channel and Levee Improvement part of the authorized project is concerned. Increment I work consists of two phases: Phase I involves the deepening, and realigning of 10.8 miles of the existing 31.8-mile long East Fork Channel (from the mouth to river mile 10.8 of East Fork Channel); Phase II, to start about two years after Phase I has been completed, involves the strengthening and raising of the existing levees around Kaufman County Municipal Utilities District No. 1 (previously comprising the Kaufman County Improvement District No. 4 (K-4) and the Kaufman County Levee Improvement District No. 5 (K-5)). It is noted that the construction contract for Increment I was awarded by the Corps of Engineers on July 14, 1972, and was terminated on August 1, 1975, when the channel improvement work was only 35 percent completed, because numerous prolonged floods made it extremely difficult to proceed with the work. Now that the Lake Laron Dam and Reservoir Modification portion of the overall, authorized project is completed, the work on the Increment I portion of the project can be restarted without any expected, major interruptions. (See p. 1-1, sec. 1.03).

Mr. Charles D. Travis
Page Two
March 30, 1978

The TDWR offers the following review comments relative to the subject document:

- (1) Pages II-2; and A-1-20, 22, 23, 24, 25, 26, 28, 31: -- All references to the Texas Water Quality Board, the Texas Water Development Board, and the Texas Water Rights Commission should be corrected to read the Texas Department of Water Resources.
- (2) Pages IV-1 through IV-8, and Supplemental Sheet, "Lavon Modification and East Fork Channel: Summary of Economic Data (October 1977 prices, 3-1/8% interest rate)": -- Based on the discussions contained on pages IV-1 through IV-8, devoted predominantly to natural resources and environmental losses, it is not readily apparent how the estimated average annual benefit of \$1,768,300 for recreation, as indicated on captioned "Summary of Economic Data," was determined.

Specifically, it appears that the following statement presented in Section 4.30, page IV-8 should be revised to describe the substantial annual recreation benefits indicated in the "Summary of Economic Data":

"4.30 Effect on Recreation. As all of the land is privately owned and generally restricted from use by the public, recreation will remain at current low use levels. It is expected that construction along the levees at County Road 3039 crossing will temporarily affect the bank fishing at the area; however, these impacts will be minimal and temporary." (Emphasis added.)

- (3) Pages II-3 & 4, sections 2.12-2.18 ("Biological Setting"), pages IV-1 through 8, sections 4.01-4.23 ("Physical & Ecological Impacts"): -- The TDWR believes that a careful analysis of the reported conditions in the project area since the incompleted channel and levee improvement contract was terminated in August 1975 (see p. I-1, sec. 1.03) will indicate that if Increment I of the subject is to be built, every effort should be made to expedite and shorten the construction period in order to minimize the adverse impacts of prolonged construction activities on the project area. If this is not feasible, then special stabilizing and protective measures should be developed and adopted in order to avoid the excessive erosion of

- (1) Noted and changed

- (2) The average annual benefits of \$1,768,300 attributed to recreation on the Economic Summary Sheet are all credited to the recreation aspects of the Lavon Dam and Lake project. Recreation cost and benefits have not been used to calculate the benefit-cost ratio for Increment I. The Economic Summary Sheet now displays summarized economic data for both the overall authorized project and Increment I of the channel and levee portion of the authorized project.

- (3) The Fort Worth District Corps is concerned about the anticipated project related erosion and siltation because the type of soil and the expected method of excavation will indeed create extensive temporary water quality problems. It will be to the contractor's advantage to expedite the completion of work scheduled for Increment I. Being cognizant of the possibility of such problems the Corps has a condition in the contract and will strenuously enforce the implementation of temporary and permanent erosion control requirements. These requirements will be met immediately upon site conditions becoming proper for implementation. Proposed construction methods have been selected so that work can continue under adverse conditions such as bad weather.

Mr. Charles D. Travis
Page Three
March 30, 1978

exposed or disturbed soil surfaces, excessive siltation of channels, and the general disruption of flood plain maintenance during the prolonged construction period. Also, further special consideration should be given to the increased vulnerability of the prolonged construction project to rising construction costs, and to delays and disruptions due to bad weather and floods.

- (4) (a) Page II-2, section 2.08; pages IV-1, 2, and 3, sections 4.01-4.07; pages V-1, and 3, sections 5.05 and 5.08; and appendix pages A-1-9 through A-1-30: -- The TDWR believes that the probable water quality impact which the channelization will have on the East Fork of the Trinity River should be considered in further detail. (NOTE: Page II-2 and pages IV-1, 2, and 3, present, in essence, the existing state of water quality in Stream Segment No. 0819; additional, related specific information is contained on pages A-1-9 through A-1-30; and, pages V-1 and 2 contain a brief assessment of the probable adverse unavoidable effects upon water quality in the said segment.)

- (b) It cannot be readily determined from the document what will be the projected construction schedule for Increment I. Thus, it is impossible to know whether planned improvements to the Garland Creek Sewage Treatment Plant (STP) will be completed by the time the channelization project begins. Also, the planned improvements at the Duck Creek STP are presently behind schedule, and no firm completion date is available. However, according to the waste load evaluation for Segment 0819, it is predicted that when improvements are complete at the Duck Creek STP, the dissolved oxygen concentration may remain above 3.0 milligrams per liter (mg/l) when flow exceeds the seven-day average low flow rate, as compared to the concentrations presently reported. Dissolved oxygen concentrations are below 2.0 mg/l, 30% to 50% of the time even when stream flow exceeds the seven-day average low flow rate, with a two-year return period.

- (c) For these reasons, it appears that the statement contained in section 5.05, page V-1, that excavation and related work on the channel will cause "complete unavoidable" disruption of the river's biological community should not be accepted a priori without considering the possibility of sequential ordering of these separate and independent "project increments" and "construction phases." Scheduling of the first increment of the dredging project to follow

- (4) (a) In response to this and other comments, the Fort Worth District, the North Central Texas Council of Governments, and the Texas Department of Water Resources cooperated in modeling efforts to more accurately predict water quality impacts. The results of these efforts have been included in revisions to Section IV, Appendix A-1, and other comments where appropriate.

- (b) The schedule for construction has not been determined, but regardless of the schedule of the proposed project or of the Garland Duck Creek sewage treatment plant, the impacts of construction activities will overshadow the projected improvements to water quality. The TDWR has classified this portion of the East Fork as a Water Quality Segment or one where the current water quality does not meet applicable water quality standards and/or is not expected to meet these standards even after application of minimum effluent limitations. With the completion of the Duck Creek Plant and with completion of the proposed channelization it cannot be guaranteed that the anticipated long term water quality improvements will be met.

- (c) This statement has been changed to read "Excavation and related work on the channel itself will cause complete unavoidable disruption of the river's biological community in Increment I for a temporary period." It is believed that the construction activity will cause complete temporary disruption of the existing aquatic community with or without improved water quality. The aquatic community should reestablish itself over a period of time. Good water quality would help the reestablishment by (1) causing quicker recovery and (2) causing higher probability of "clean water" organisms becoming established. It is expected that the Duck Creek sewage treatment plant will be fully operational by the time construction begins on Increment I.

Mr. Charles D. Travis
 Page Four
 March 30, 1978

improvements at the City of Garland's Duck Creek SFP could result in a less severe stress on the aquatic environment during channelization because the toxic effects of pollutants and suspended materials are known to decrease with increasing oxygen concentrations in the stream system. Such consideration obviously would necessitate the inclusion of such an alternative plan in section VI, beginning on page VI-1, unless federal congressional authorization of the project and other necessary actions will automatically result in a logical, sequential ordering of the project increments.

(d) Without a thorough consideration of the foregoing comment, it is impossible to state unconditionally that the proposed action covered by the subject draft supplemental EIS is consistent with the policies and programs of the TDWR to maintain and improve the water quality of the State.

(5) Summary, Page 1, paragraph 3a, and page IV-1, section 4.01: -- Attention is invited to the captioned references which indicate that the proposed improved levees, in conjunction with the improved channel and levee-sluice structures, will provide protection to the leveed area for floods up to the magnitude of a 50-year flood. Design based on a statistical 50-year flood could be contrary to TDWR policy regarding design flood frequency, established by the Texas Water Development Board, as specified in "Texas Department of Water Resources Rules," Chapter X, Section 136.10.20.005(a), page X-15. This rule, relating to flood data required concerning levee improvement districts and approval of plans for reclamation projects, provides that:

"The project design shall be based on a statistical 100-year flood as a minimum where substantial property loss and/or risk of life may be possible. The Executive Director will review the plans... and he may recommend that the project design be based on other than the 100-year flood should only agricultural land (no structures) be involved and no interests other than those of the applicant be affected...." (Emphasis added.)

(d) The Fort Worth District has used the water quality model for Stream Segment No. 0:19 to develop probable water quality changes expected to result from channel modification. The model projections indicate that with the possible exception of construction activity related impacts, the project should generally be consistent with the programs of the TDWR. DO is projected to remain above effluent dominated stream standards with the project although DO levels at the confluence with the Trinity River could be slightly lower than those levels projected without the project.

(5) The major portion of the benefits claimed for the project are for prevention of flood damages to cropland. The remaining benefits are claimed for protection of levees, fences, roads, etc. Prevention of damages to habitable structures was not included because such structures do not exist in the area to be protected.

Mr. Charles D. Travis
Page Five
March 30, 1978

It is noted that an application for approval of levee and channel improvement plans will have to be made to the TDWR. If the project design is to be based on other than the 100-year flood, the burden of proof that "only agricultural land (no structures)" is involved will rest with the applicant.

(6) Pages V-1 and V-2, Section V ("Any Probable Adverse Environmental Effects Which Cannot be Avoided"): -- The TDWR believes that Section V (unavoidable environmental effects) logically should include an analysis of the significant project effects on ground-water levels, presented on page IV-3, sections 4.08 through 4.10.

(7) Page A-1-4, Appendix A-1, Figure 1 ("Typical Boring Within the Centerline of the Proposed Channel"): -- Attention is invited to the line and notation, "Water Table, 3-15-67," appearing in the upper left portion of the captioned Figure. TDWR suggests that the specific elevation of the water table on 3-15-67 be shown on the diagram because no scale is provided on the diagram from which the elevation of, or depth to the water table can be determined.

We appreciate the opportunity to review the subject draft supplemental document. Please advise if we can be of further assistance.

Sincerely,

Charles E. Davis

for Harvey Davis
Executive Director

(5) continued. The Federal Government is not required to obtain approval of its plans by a State agency, according to two Federal cases, Anderson v. Seeman, 252 F.2d 321, (5Cir 1958), and Naches River Conservation District v. Seeman, 252 F.2d 327, (5Cir 1958), writ of cert. den. on both, 79 S.Ct. 32 (1958). However, the Corps will continue to coordinate plans for review and comment by the TDWR and other state agencies as appropriate.

(6) This has been addressed in paragraph 5.06.

(7) The subject elevation is 344.5 msl. The figure has been changed to indicate this elevation.

TEXAS STATE SOIL AND WATER CONSERVATION BOARD



1000 First National Building

P. O. Box 658

Temple, Texas 76701

Area Code 817-773-2150

April 3, 1978

RECEIVED

APR 4 1978

Budget/Planning

Mr. Ward C. Goessling, Jr., Coordinator
Natural Resources Section
Budget and Planning Office
Office of the Governor
411 West 13th Street
Austin, Texas 78701

Dear Mr. Goessling:

You have forwarded a draft supplement to the environmental impact statement for the Lavon Dam and Reservoir modification and the East Fork channel improvement pertaining to increment 1 of the channel and levee improvements of the East Fork of the Trinity River in Kaufman County, Texas.

We note on page VII-1 of the draft that a memorandum of agreement between the levee districts and the Corps of Engineers specifies that all remaining woodlands between the East Fork and the levees will be protected from clearing for the life of the project.

(1) In reviewing the draft, we were unable to determine the title owners of this area. Assuming the title to this land still belongs to private individuals, we do not feel that a restricted use should be imposed unless compensation is provided the landowners.

(2) Page IV-7, states that the "Reduction of agricultural flood losses comprises almost the total average annual benefits of the total project...." Being cognizant on the vital role agriculture plays in our society and given your figures for the benefits to be derived from reducing agricultural flood losses, it appears that any restricted use within the project area is an unnecessary and unjustifiable financial handicap.

(3) This project, being implemented by a public entity, for a public purpose, should represent a public decision to forgo the public interest in one public resource for another.

(1) Figure 9 in Appendix A-1 shows approximate boundaries of land holdings. It also shows who owns the properties. Table II on page A-1-46 lists the landowners who would be protected by the project. The Table also shows who his land on which improvements will be situated.

The US Fish and Wildlife Service recommended that, as much habitat (timber) be preserved as possible to mitigate the wildlife losses expected to occur because of construction. Since the project is designated a local flood protection project it is the responsibility of the local interests to furnish the lands needed for the project. In this case it would involve the Levee Improvement and Municipal Utilities Districts buying land from its members and then taxing them to pay for it to set it aside. With the Memorandum of Agreement the landowners hold possession and vow to reasonably maintain the existing timber. Compensation will be in the form of increased flood protection to these and the numerous other lands.

(2) The landowners will be permitted to continue using the obligated lands for purposes similar to those now used. They should be able to reap a more assured income because of reduced flood losses to lands currently in agricultural production. Should a National crisis of food and fiber arise the future use of the lands to avert that crisis is not closed.

(3) It does. The public foregoes fish and wildlife habitat and expends public funds to provide flood protection to fertile, productive agricultural lands.

ward C. Boessling, Jr.
April 3, 1978
Page 2

A complete disclosure of this restricted use should be made to determine at least the following factors:

- (4) 1. The amount of land in this area which is privately owned.
- (5) 2. The amount of acreage proposed for restricted use.
- (6) 3. The loss of agricultural income that might be anticipated as a result of restricted use.
- (7) 4. The average annual benefits to be derived from such a restricted use versus the average annual benefits possible with no restricted use.

On page A-1-22 we note the following statement:

"Within the 235 square mile drainage area below Forney Dam, nonpoint discharges entering the river are derived largely from agricultural land. Pollutants from these areas are largely comprised of agricultural chemicals and animal waste...."

- (6) This statement seems rather positive for an issue in which, to our knowledge, present data is not available to determine the extent of agricultural, nonpoint source pollution from agricultural lands. We have reviewed the 1977 annual water quality management plan developed under the policy guidance of the Governor's Area-wide Planning Advisory Committee for North Central Texas. This plan confirms that present data is not available.

IN A-22

Additionally, we have noted sections within this draft statement which confirm the lack of data. We have also noted sections which might indicate possible sources other than agricultural operations. Specifically, we call your attention to the following items:

1. Page II-2 states "Nonpoint discharges into the East Fork include urban, residential, and agricultural runoff. The amount of nonpoint discharge is unquantifiable." We would assume that if the amount is unquantifiable, the source would also be unquantifiable. Homeowners quite frequently apply some of the same chemicals to lawns that would be used for agricultural purposes. In many of these cases, rates of application are much higher on lands than would normally be applied for agricultural purposes. Family pets, like cattle, also might provide fecal coliforms. Once any of these elements are in the water, locating the source can be next to impossible.
2. Page A-1-3 states "Results of coliform testing on soil and sediment samples indicate a substantial number of coliforms (fecal and total) exist in both the river sediments and adjacent flood plain soils due to wastewater treatment plant effluents...." If flooding from effluent waters were possibly responsible for accumulating coliforms in the soil,

- (4) All of the land in the project area is privately owned.
- (5) The amount of woodland to be protected by the Memorandum of Agreement is not specifically known. Estimates range from 2430 acres to 2975.7 acres.
- (6) There will be no loss because there will not be a change in land use.
- (7) With the improved project in place, flooding of the area in question would still be fairly recurrent. Thus it would not be feasible to convert these woodlands to productive cropland. Accordingly, it is not anticipated that any additional flood control benefits would be derived if the land is restricted or not.

(8) Noted

- (9) Noted. Paragraph 2.0" on page II-2 has been changed to provide some quantification.

Ward C. Joessling, Jr.
April 3, 1978
Page 3

We would assure that some of these same coliforms could, at a later date, be suspended in runoff from this land. We would also assume that this same effluent, under flooding conditions, could be capable of depositing "agricultural chemicals." We would also assume that this flooding explains the oil and grease concentrations in soil samples, as discussed on that same page.

3. Page A-I-19 the same information as stated above in #1 is reiterated.

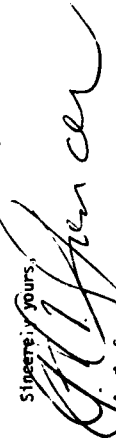
4. Page A-I-35 & 36, indicates that impounded or semi-impounded water within the project area "...contain relatively good water quality as most receive runoff from rain rather than polluted river water."

We would not prefer to advocate that this area, or any area in Texas, is completely incapable of contributing to water quality problems because of agricultural operations. However, we do intend to let the water quality experts identify, through scientific methods acceptable to the Governor of this State, the water quality problems arising from agricultural nonpoint sources as specified in Section 208 of P. L. 92-500.

We do appreciate the leadership the Corps of Engineers have provided in this project. We feel that as the demand for food and fiber increases, the benefits of reducing the agricultural flood losses will increase proportionally. As a result of studying the alternatives available to this area the Corps has proposed what we consider to be a feasible and practical course of action.

Thank you for the opportunity to review this draft statement.

Sincerely yours,


A. C. Spender
Executive Director
MCS/LC

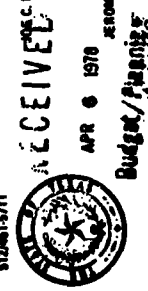
TEXAS AIR CONTROL BOARD

8200 BRIDAL CREEK BOULEVARD
AUSTIN, TEXAS 78758
512/461-5711

JOHN L. BLAIR
Chairman
CHARLES B. JAYNES
Vice Chairman

BILL STEWART
Executive Director

WILLIAM M. ALLAM
JACK C. BRIDGEFARMER, P. E.
FRED HARTMAN
D. JACK KILIAN, M. D.
FRANK H. LEWIS
WILLIAM D. PARISH
JEROME W. SORENSON, P. E.



April 5, 1978

Mr. Ward C. Goessling, Jr.
Natural Resources Section
Budget and Planning Office
Office of the Governor
411 West 13th Street
Austin, Texas 78701

Subject: Draft Supplement to Environmental Statement for
Layton Dam and Reservoir Modification and East Fork
Channel Improvement
BIS: 8-002-016

Dear Mr. Goessling:

We have reviewed the above cited document and are pleased with the stated intent to prevent excessive dust and machinery emissions during construction activities and levee modifications. Although there will probably be some short-term localized effects during the channel construction and modification, we believe this project will not significantly affect the overall ambient air quality. The project therefore does not conflict with the goals of the Texas Air Pollution Control Implementation Plan.

Thank you for the opportunity to review this document. If we can be of further assistance, please contact me.

Sincerely,

[Signature]
Roger R. Wallis, Deputy Director
Standards and Regulations Program

cc: Mr. Melvin Lewis, Regional Supervisor, Fort Worth

No response.

Paul L. Duff, M.D., J.P.H.
Commissioner
Raymond T. Moore, M.D.
Deputy Commissioner

Texas Department of Health



1100 West 49th Street
Austin, Texas 78756
452-7111

March 30, 1978

RECEIVED

APR 4 1978

Budget/Planning

Mr. Ward C. Goessling, Jr., Coordinator
Natural Resources Section
Governor's Budget and Planning Office
Executive Office Building
411 West 13th Street
Austin, Texas 78701

SUBJECT: Kaufman County, Texas
Levon Dam and Reservoir Modification
and East Fork Channel Improvement
Trinity River
U.S. Army Corps of Engineers

Dear Mr. Goessling:

The Draft Supplement to the Environmental Statement for the "Lavon Dam and Reservoir Modification and East Fork Channel Improvement" project has been reviewed for its public and environmental health implications. The report was prepared by the Fort Worth District Army Corps of Engineers and is undated. An Environmental Statement on the Lavon Dam and Reservoir portion of the project was filed with the Council on Environmental Quality in July, 1976. The subject Supplement updates information on the earlier Environmental Statement relative to the "Increment 1" phase of the East Fork Channel and Levee Improvement portion of the authorized project.

The action proposed will be beneficial in that it will reduce flood frequencies and durations in the areas of Kaufman County Municipal Utilities District Number 1 and Kaufman County Levee District Number 5. The proposed levee improvements, in conjunction with the improved channel and sluices, will provide protection to the leveed area for floods up to the magnitude of a 50-year flood; the resulting improvement in surface drainage is expected to reduce the size of areas which provide a breeding place for mosquitoes.

- (1) The statement filed in July, 1976 addressed operation and maintenance programs of Lavon Dam and Reservoir. The final environmental statement for the Lavon Dam Modification and East Fork Channel Improvement was filed 29 March 1971.

Members of the Board
Robert D. Morrison, Chairman
William L. Fernald, Vice Chairman
Raymond E. Wenzel, Secretary
Rodrick M. Bell
Johnnie M. Brinson
H. Eugene Brown
Ramon Cline
Charles M. Cole
Robert A. Conner
Sam M. Durr
William J. Edwards
Raymond C. Garrett
Bob D. Glaze
Stanford T. Hollen
Donald A. Horn
Ralph L. Lohme
Paul J. Smith
Ray S. Smith

Mr. Gensling
Page Two
March 30, 1978

- (2) The construction proposed in this project will result in a short term degradation of surface water quality during the period of construction; this problem can be minimized by appropriate engineering and construction practices. Even with the application of proper engineering and construction practices, increased sediments are expected to occur in surface water which may be used as a drinking water supply. The Safe Drinking Water Act established limits for turbidity; the increased loading of sediments resulting from construction could possibly create additional problems in the treatment of water such as the maintenance of turbidity within acceptable limits.
- (3) The quality of air in the construction areas is expected to be degraded during construction operations as a result of machinery exhaust emissions and fugitive dust resulting from the movement of machinery. Detailed information regarding the severity of air quality problems is not available; however, there is no indication from information presented in the Environmental Statement that air quality will be significantly different from that encountered in other similar construction projects.
- (4) Noise levels will be increased during construction. Due to the relative location of the project from densely populated areas, no adverse public health conditions are expected to result from the noise of construction other than in the immediate working area.

We appreciate the opportunity to review and comment on the Draft Supplement to the Environmental Statement for Laven Dam and Reservoir Modification and East Fork Channel Improvement project.

Sincerely,

Dr. Hargis

G. R. Hargis, Jr., P.E.
Deputy Commissioner for Environmental
and Consumer Health Protection

DLM/cdd

cc: Bureau of State Health Planning
and Resource Development, TDM
Public Health Region 5, TDM
Division of Water Hygiene, TDM
Division of General Sanitation, TDM
Division of Occupational Health
and Radiation Control, TDM

- (2) Noted. Our research turned up no drinking water supply take-out points between the confluence and Lake Livingston.

- (3) Because of the existence of adequate well moisture, this project may degrade dust related air quality less than at other construction projects. The amount of vehicle emissions should not vary much from that encountered in similar projects.

- (4) Noted.



COMMISSION
H. H. HARRIS, Chairman
L. C. HARRIS, Secretary
L. C. HARRIS, Secretary

STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
ALBUQUERQUE, NEW MEXICO

ENGINEER/DIRECTOR
B. L. DeBerry

March 24, 1978

IN REPLY REFER TO
FILE NO.

DB-E 434

RECEIVED

Draft Supplement to Environmental Statement
Corps of Engineers
Kaufman County

MAR 27 1978

Budget/Planning

Lavon Dam and Reservoir Modification
and East Fork Channel Improvement

Mr. Ward C. Goessling, Jr., Coordinator
Natural Resources Section
Governor's Budget and Planning Office
411 West 13th Street
Austin, Texas 78701

Dear Sir:

Reference is made to your memorandum dated February 22, 1978 transmitting the above captioned draft supplement to the environmental statement for review and comments.

It is noted that the F.M. 3039 bridge (completed in August 1974) was designed in accordance with information furnished by the U.S. Corps of Engineers.

No adverse effects on F.M. 3039 or U.S. 175 are anticipated should the Corps of Engineers improve the channel as proposed.

Sincerely yours,

B. L. DeBerry
Engineer-Director

By: *R. L. Lewis*
R. L. Lewis, Chief Engineer
of Highway Design

No response.



PLANNING PROGRAM
1700 North Congress Ave.
Austin, Texas 78701
(512) 475-1539

RECEIVED

MAR 30 1978

Budget/Planning

March 27, 1978

Mr. Albert Schutz
Budget and Planning Office
Office of the Governor
411 West 13th Street
Austin, Texas 78701

RE: Draft Supplement to Environmental Statement for Lavon and Reservoir
Modification and East Fork Channel Improvement

Dear Mr. Schutz:

The General Land Office staff has reviewed the report on "Lavon and Reservoir
Modification and East Fork Channel Improvement".

We have no objections to the proposed improvements of this project.

Sincerely

A.J. Bishop

A.J. Bishop,
Coordinator

AJB:mr

No response.



PM 5.7

TEXAS FOREST SERVICE

College Station, Texas 77843
March 8, 1978

LTC Harvey D. Hodges
Deputy District Engineer
Department of the Army
Fort Worth District, Corps of Engineers
P. O. Box 17300
Fort Worth, Texas 76102

Your File: SNFED-PR

Dear Colonel Hodges:

Your letter of February 16, 1978 w/Draft Supplement To
Environmental Statement For Lavon Dam And Reservoir Modification
...has been received.

Thank you for pointing out the existence of a memorandum
of agreement with the local sponsors...can you provide me with
a copy of the agreement, or at least highlights of the principal
features of the agreement, at early convenience.

We have no objections to implementation of the project as
reflected in the Draft Supplement.

Very truly yours,

Mason C. Cloud

Mason C. Cloud
Head, Forest Environment Dept.

MC/jc
cc: Ward Gessling

The signed copies of the Memorandum of Agreement were received immediately
prior to publication of this Final Supplement and it has been included as
Appendix B.



OFFICE OF THE GOVERNOR

April 18, 1978

DAVID BRIDGES
Governor

Colonel Harvey D. Hedges
Deputy District Engineer
Department of the Army
Fort Worth District
Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102

Dear Colonel Hedges:

The Budget and Planning Office recently coordinated the review of the Draft Supplement of the Final Environmental Statement for Laron Dam and Reservoir Modification and East Fort Channel Improvement. Subsequent to the completion of the review process, the enclosed comments were received from the Texas Parks and Wildlife Department.

Please place this information with the original material. We regret any inconvenience this may cause. If this Office can be of further assistance, please contact us.

Sincerely,

Ward C. Goswelling, Jr., Coordinator
Natural Resources Section
Budget and Planning Office

Enclosure

No response.

PARKS AND WILDLIFE DEPARTMENT

COMMUNICATIONS

PEARCE JOHNSON
Chairman, Austin

JOE E. RULTON
Vice Chairman, Lubbock

JOHN M. GREEN
Secretary



HENRY D. BURNETT
Director
4200 Smith Street, Room 1144
Austin, Texas 78744

LOUISA M. DILLON
San Antonio
JAMES R. PAXTON
P. O. Box 100
PERRY H. BELL
P. O. Box 100

April 18, 1978

Mr. Ward C. Goessling, Jr., Coordinator
Natural Resources Section
Governor's Budget and Planning Office
Executive Office Building
411 West 13th Street
Austin, Texas 78701

Re: Draft Supplement to Environmental Statement for Lavon Dam and
Reservoir Modification and East Fork Channel Improvement

Dear Mr. Goessling:

This agency has reviewed the referenced document and offers the following
comments for consideration by the Corps of Engineers.

(1)

The present game fish population of the East Fork of the Trinity includes
channel catfish, largemouth bass, white crappie, sunfish, white bass,
striped bass, striped bass hybrids and possibly walleye. It is our belief
that 90 percent of the present fish population, including game and rough
fish, will be removed by the project as designed.

(2)

This section of the river is used as a sanctuary by striped and hybrid
bass from Navarro Mills Reservoir, Bardwell Reservoir, White Rock Lake,
Garza-Little Elm Reservoir and other impoundments. Striped bass and
hybrids entering the Trinity River from the above reservoirs seek the
higher river flow and better quality water found in the East Fork of
the Trinity. As additional striped bass and hybrids are stocked in
these reservoirs, a significant striped bass fishery is expected to
develop in the tailrace of Ray Hubbard Reservoir, located immediately
above the proposed channelization. The proposed channelization would
destroy this sanctuary except for the tailrace area.

(3)

The East Fork of the Trinity would serve as a major spawning area for
the flathead catfish - a major predator on nongame fishes - from the
proposed Tennessee Colony Reservoir. East Fork of the Trinity is the
first major tributary above the newly proposed reservoir and the
spawning habitat would be significantly altered by channelization.

(1) We have no information or data to substantiate the presence of
these species. Existing water quality conditions in Increment I appear
to be restrictive to such a population.

(2) At the present time, the quality of water in Increment I of the
East Fork is not favorable to such a situation. In the event of im-
proved water quality, the project would have impacts on physical aquatic
habitats as stated in paragraph 3.08 (page V-2).

(1) Noted.

Mr. Ward C. Goesslin, Jr.
Page Two
April 18, 1978

- (4) Although the mean oxygen level is reportedly slightly below standard at present, channelization would further reduce the oxygen level in the East Fork of the Trinity. Further degradation would result with an increase in the sediment load due to channelization.
 - (5) The improved streambed channel would be an average of 9 feet below the existing streambed, with a maximum lowering of 12 feet at river mile 6.5. A straightening of the channel would create oxbows from the present stream channel course. However, the oxbows would have little fishery value since the oxbows would probably be drained due to the much lower elevation of the channelized streambed.
 - (6) Section 4.22 (page IV-6) states that the southern bald eagle is the only potential endangered wildlife species in the area. Migrating Arctic peregrine falcons (*Falco peregrinus tundrius*) would also be likely transient. Prey species are abundant and the generally open character of the area would be desirable hunting terrain. Major river systems serve as migration corridors for these birds as documented by this Department's Mowgana Project.
 - (7) Section 4.14 (page IV-4) overlooks the secondary impacts of the proposed project. Reduced flooding will render additional wildlife habitat available for expanded agricultural operations. As a result, considerable wildlife habitat will be lost as this previously "idle" land is converted to livestock and crop production.
 - (8) The section entitled "Alternatives" (Section VI) should be expanded to include under each alternative a realistic discussion of adverse effects and/or benefits, both short and long term, on fish and wildlife.
 - (9) Section 8.01 (page VIII-1) states that none of the terrestrial or aquatic natural elements will be lost for all time. Completion of this project is expected to foster increased land use activities, which will persist and render the wildlife habitat lost or, at best, severely disrupted. Land use demands are more intense than in the past, and the probability for deferral of any arable land is extremely low.
 - (10) An alternative not explored in Section VI could consist of minor work in the existing channel in the form of de-snagging and general clearing of debris in problem areas. This would affect the fishery somewhat by removing natural fish attractors in the form of brush and other snags, but would significantly decrease the impacts on the fishery with proper planning.
- Should the project be implemented as planned, the following comments are offered for your consideration.
- (11) The impoundment of water on an acre-for-acre basis for fish habitat lost would partially offset expected losses. Replacement could be

- (2) Water quality modeling in response to this and other comments indicates that with the project, DO level would be maintained in the upper reaches of the Trinity. The high regeneration potential of the proposed drop structure would transition the natural channel into the proposed change.
- (3) The resulting oxbows will be blocked so that they will hold water.
- (4) Noted and revised to an extent.
- (7) Paragraph 7.01 (page VII-1) discusses the Memorandum of Agreement between the levee districts and the Corps of Engineers which is designed to protect remaining woodlands from clearing. Since wildlife habitat is a function in flooding should not be beneficial to them.
- (8) Impacts of the structural alternatives are similar and are addressed in paragraphs 6.08 and 6.11. Although the non-structural alternatives are less detrimental to fish and wildlife, these evaluations are not made in detail because the alternatives do not fulfill the objectives of the project or they are economically or technically infeasible.
- (9) The Memorandum of Agreement is the instrument to defer agricultural land located between the realigned East Fork Channel and the levees on the east bank.
- (10) The de-snagging and general clearing would be part of the no action alternative. It was eliminated because the desired channel capacity could not be obtained and the capacity is needed to facilitate interior drainage of the leveed area.
- (11) The oxbows will be blocked off and maintained permanent ponds. Abnormal flows and ground water will provide sufficient water to the tank.

Mr. W. C. Cessing, Jr.
 Page Three
 April 18, 1978

done by blocking off and maintaining on-box as permanent ponds. This procedure may require periodic pumping of water into the ponds to maintain an adequate water level in view of the lowered water table. Natural runoff alone would probably not maintain water levels, however, due to the narrow watershed. The construction of small, deep ponds adjacent to channels to serve as fish sanctuaries during low-flow periods may be required. Due to the lowered water table, these also may need to be maintained by pumping additional water. Also, the channel bottom could be modified to provide deep holes for fish sanctuaries during low flows.

(12) Additionally, some restoration of fisheries losses could be accomplished in the straightened and deepened artificial channel by installation of artificial devices. These could be selected from Part 3.10, "Habitat Rehabilitation", Task 3: Interim Guide to the Performance of Fish and Wildlife Habitat and Population Improvement Measures for Western Dam and Reservoir Projects, WELUT Project 17, U. S. Fish and Wildlife Service. Artificial meanders, check dams, wing deflectors, rock deflectors and random boulders as described could help mitigate the alterations due to channelization; a minimum of two (2) per 1000 feet of altered channel is suggested in the WELUT document. Fisheries biologists of this Department would be available to assist in the planning of the type and number required and the exact locations.

(14) Strategically located areas of wildlife habitat (i.e. trees, brush, etc.) should be left in place to provide cover and food for those wildlife species present. Wildlife biologists of this Department would be available to assist in the location and designation of these areas.

Sincerely,

W. C. Cessing, Jr.
 Executive Director

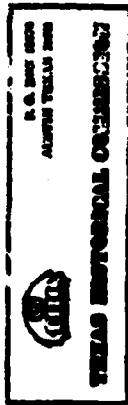
WCS:LER:lmw

fish, in conjunction with natural surface runoff, without providing pumps. Natural erosion and meandering within the new channel bottom will provide non-uniformities for fish sanctuaries.

(12) Artificial devices are not planned to be provided. Natural meanders and other natural non-uniformities are expected to develop over time which will aid in sustaining the fishery.

(13) Offer of assistance noted and appreciated.

(14) Offer of assistance noted and appreciated.



THOMAS L. LUTHER
EXECUTIVE DIRECTOR

June 2, 1978

Colonel John F. Wall
District Engineer, Fort Worth District
U.S. Army Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102

ATTN: James C. Chandler

RE: 1) Draft Supplement to Environmental Statement, Lavon Dam
and Reservoir Modification and East Fork Channel Improvement

2) Archeological Survey of Areas to be Affected by the
East Fork Channel and Levee Improvement Project, Dallas
and Kaufman Counties, Texas

Dear Sir:

In response to your request concerning the above-referenced reports, we have read them carefully but are unable to determine which report deserves closer attention in our consideration of the problems of cultural resources to be affected by the proposed undertaking. For example, on page 20 of the archeological assessment, five sites are recommended for testing to determine their significance pursuant to determinations of eligibility for the National Register. It seems that the requirement of E.O. 11593 Section 2(a), to "locate, inventory, and nominate...all sites... that appear to qualify for listing on the National Register of Historic Places" has not been met. Testing appears to be warranted and an appropriate recommendation for further work.

(1) It is difficult to pinpoint the location of these sites in relation to the project. In order to better evaluate the impact of the undertaking on cultural resources, please send large scale maps which plot the archeological sites in relation to those areas directly affected by construction. This is requested for sites X41DL2, X41DL6, X41KP7, X41KP8, and X41KP10.

(2) If these sites are to be considered eligible for inclusion, until

(1) Large scale map showing location of the two archeological sites (X41KP6 and X41KP7) known to be situated in the increment 1 project area were sent by letter dated 22 June 1978. A copy of the letter is on page IX-36.

(2) Avoidance of the sites is the proposed mitigation measure.

Colonel John P. Wall
June 2, 1978
Page 2

(1) They are tested as the archeological assessment indicates, mitigation can include avoidance. In addition, as sites appear to constantly be discovered in cut banks, archeological monitoring of this particular project during construction might prove, after other matters have been resolved, an acceptable approach.

(4) From our reading of the draft report, it appears that sites of "archeological interest" are to be avoided, thereby indicating that since the time of the initial archeological survey, the project scope has been altered. Archeological surveying in new areas to be affected might reveal significant sites eligible for the Register.

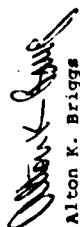
(5) In sum, we find the draft report inadequate as regards the treatment of cultural resources to be affected by the project and request additional data, investigation, etc. as may prove necessary to determine these effects.

Your attention to these matters is appreciated. If I may be of further assistance, please advise.

Sincerely,

Truett Latimer
State Historic Preservation Officer

By



Alton K. Briggs
Director
Cultural Resource Management

AKB:ls

cc: Mike Bureman
S. Alan Skinner

(3) Qualified archeologists will be kept on call throughout the construction of this project to evaluate any material or deposits appearing to be of archeological interest.

(4) Project scope has not been changed but some modifications have been made to protect environmental and cultural resources. The entire project area was covered in the 1976 archeological survey.

(5) Additional data was submitted by letter referenced in response (1) (copy on following page) which inclosed a letter from the Director of the Archaeological Research Program at Southern Methodist University (copy on page 1, 2, 3) and a large scale map indicating relative location of the two known sites.

50-10-42

Mr. Irwin Latimer
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

Dear Mr. Latimer:

This is in response to the letter from your office dated June 7, 1978, regarding the cultural resources of the East Fork of the Trinity River, Kaufman County, Texas.

There appears to be some misunderstanding about the area of the East Fork to which modification is proposed. The supplement to the Environmental Statement for Lavon Dam and Reservoir Modification and East Fork Channel and Levee Improvement pertains to Increment I only. Increment I involves the most downstream 10.8 miles of the East Fork channel. This area is covered by Figure 2 in the supplement to the statement.

Within this 10.8 mile reach there were two archaeological sites discovered during the 1976 survey conducted by Jeffery J. Skinner of the Archaeology Research Program at Southern Methodist University. These sites were numbered X-1276 and X-1277. The sites are located as indicated on the enclosed map.

These sites were revisited by Mr. Ray Losornio of our District Office and Dr. S. Alan Skinner of Southern Methodist University on 8 June 1978 to determine the relationship of site location to the area of proposed construction activity. A copy of the letter from Dr. Skinner, reporting on findings from the field trip, is enclosed to provide you with additional information about the proposed method of protecting the cultural resources in the project area.

Should any deposits appearing to be of archaeological interest be uncovered during the excavating of the improved channel or the improving of the levees, the Corps will immediately seek the consultation of qualified archaeologists to determine the proper handling of the resource.

5010-PP

Mr. Irwin Latimer

We hope the enclosed information will clarify our position on this matter with your approval.

Sincerely,
Colonel

2 Incl
As stated

John P. Miller
Colonel
District Engineer



SOUTHERN METHODIST UNIVERSITY

ARCHAEOLOGY RESEARCH PROGRAM
Department of Anthropology
DALLAS, TEXAS 75275

June 14, 1978

Mr. Jim Chandler
Environmental Resources Section
U.S. Army Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102

Dear Mr. Chandler:

On June 8, 1978, Mr. Ray Losornio of the U.S. Army Corps of Engineers and I visited archaeological sites X41K66 and 7 along the East Fork Clearance and Levee Improvement Project. This on site was conducted in order to determine the impact future construction may have upon these archaeological sites.

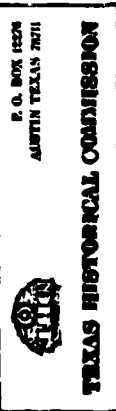
As you are aware the project was partially completed several years ago and no further land modification is to be done in the vicinity of Site X41K67. The borrow pit that was being considered has been deleted because sufficient soil was available within the floodplain. We appreciate your allowing us to record this site but it will not be altered by the project.

The Sand Hill Site (X41K66) is well known to collectors but last week I found very little evidence of prehistoric occupation although there is a historic house site on top of the hill and outside of the construction area. Mr. Losornio reviewed the construction plans and he agreed to fence the slope of the hill so that heavy equipment will not go over the slope or the crest of the hill. This will insure that erosion will not be accelerated and any buried deposit near the hill crest will be avoided and protected. I urge you to have someone on your staff or an archaeological consultant on call to monitor during the project. The Texas Historical Commission should find these steps satisfactory to insure your concern for the archaeology.

In summary I want to thank you for your continued efforts to preserve the nonrenewable evidence of man's history in Texas.

Sincerely,
Alan Skinner
Alan Skinner
Director

SAS:eg



TRUETT LATIMER
EXECUTIVE DIRECTOR

July 24, 1978

Colonel John F. Wall
District Engineer
Department of the Army
Fort Worth District, Corps of Engineers
P.O. Box 27300
Fort Worth, Texas 76102

Re: East Fork of the Trinity River, Kaufman County, Texas

Dear Colonel Wall:

We are in receipt of the archeological evaluation and additional information concerning the above-referenced undertaking. After a review of the findings, we conclude that, as described, the proposal should not affect sites on the National Register of Historic Places, nor any site presently in the process of submission to the National Register. The survey of sites in the area which may be eligible for inclusion within the National Register, however, has not been completed. Therefore, should cultural resources be encountered during construction, work will cease and the State Historic Preservation Officer and the Advisory Council on Historic Preservation will be afforded the opportunity to comment in accordance with the Procedures for the Protection of Historic and Cultural Properties (36 C.F.R., Part 800).

Thank you for the opportunity to participate in the review process in our common goal of providing the future with a past. If we may be of further assistance, please advise.

Sincerely,

Truett Latimer
State Historic Preservation Officer

By *Alton K. Briggs*
Alton K. Briggs
Director
Cultural Resource Management

AED: bpl

cc: Mike Bureman
Alan Skinner

North Central Texas Council of Governments



P. O. Drawer COG Arlington, Texas 76011

March 29, 1978

Colonel John F. Hall
U. S. Army Engineer District
P. O. Box 17300
Fort Worth, Texas-76102

RE: SA 18-03-08035, Draft EIS for Channel
and Levee Improvement of the East
Fork Trinity River, Kaufman County,
Texas

Dear Colonel Hall:

Your Draft EIS in connection with the above entitled project has been reviewed by the North Central Texas Council of Governments. This review included the notification of potentially affected local governments including the Cities of Dallas, Mesquite, Garland, Seagoville, Forney and Crandall; Dallas and Kaufman Counties; North Texas Municipal Water District; Texas Area 5 Health Systems Agency. These local governments were invited to comment on the local impact of the proposal, and replies received from NCTCOG's notification are attached to this letter.

In addition, the Draft EIS was reviewed for appropriate areawide concerns. This review process included consideration by appropriate NCTCOG planning staff, by the Government Applications Review Committee on March 8, 1978, and by the NCTCOG Executive Board on March 24, 1978. On the basis of that review process, the Board adopted the following areawide position:

It is recommended that the questions and issues identified in the attached NCTCOG Project Analysis be fully addressed in the development of the Final Environmental Impact Statement, that mitigating measures be developed to offset potentially adverse impacts, and that these issues be given particular attention in the final decision by the Army Corps of Engineers on the feasibility of the project.

We sincerely thank you and your staff for your kind cooperation in this matter, and if we can be of further service or assistance, please feel free to call upon us.

Sincerely,

William J. Pflaick
Executive Director

WJP:sw

cc: Harvey D. Hodges, LTC, C.E. Deputy District Engineer, Fort Worth, Texas
Council on Environmental Quality, Washington, D.C.

NCTCOG PROJECT ANALYSIS

PROJECT ANALYSIS

- Relationship of this application to applicable review criteria:

(1) A. Possible revisions to increase efficiency and effectiveness:

1. The Draft EIS indicates the benefit/cost ratio without project elements already completed is less than one to one, when normally the ratio for construction projects is at least one to one. How can this project be justified if its benefit to cost ratio is only .55 to 1? This project should stand on its own merit and not on project elements which have been completed (Lake Lavon Improvements).

B. Consistency with local and areawide planning:

This project has implications for NCTCOG's (208) water quality non-point source of pollution planning activities. NCTCOG, with the cooperation of the local governments in the region, is required by law to develop strategies for improving the water quality of rivers, streams and lakes to reach the 1983 goal of "fishable and swimmable waters."

- (2) 1. What is the impact of dissolved oxygen, modification of temperature, and water quality within the proposed channelized stream of widening and dredging the East Fork Trinity River and removing vegetation that shades the river banks?

C. Extent of coordination with other projects and local governments:

The water discharged from Lake Lavon must pass through the City of Dallas' Lake Ray Hubbard before reaching the proposed channelized segment of the East Fork. One of the stated goals of the project is to increase the water flow to 3,000 cfs from Lake Lavon, which is an increase of 3,000 cfs from the current water rate?

- (3) 1. What will be the impact on the water level of Lake Ray Hubbard if any?
- (4) 2. What coordination has taken place between the City of Dallas and the project sponsor to date?
- (5) 3. What effect will this project have on the City of Garland and Mesquite's wastewater treatment levels? If the water quality is adversely affected, what implications does this have in the future for the State or EPA to require higher levels of treatment for communities discharging into the East Fork?

D. Effects on the environment:

One of the goals of any draft environmental impact statement is to measure the effects on the ecological environment.

- (1) The River and Harbor Act of 1962 (Public Law 87-874) authorizes the Dam and East Fork channel and levee work as one project. It has been carried on the books for appropriations as one project which has had some benefit-cost ratio. It was broken out to demonstrate that it was incrementally justified at times in the past. It is not now incrementally justified when considered as a part of the original project, the original project is still feasible.

- (2) Channelization (widening and deepening) of Increment 1 and removing shoreland vegetation will decrease dissolved oxygen and increase temperature extremes. Modeling of water quality, particularly dissolved oxygen, conducted by the TDMR with the cooperation of NCTCOG indicates that with construction of the project, any decreases in DO due to temperature increases will be overshadowed by the re-aeration effect of the proposed transitioning drop structure. Observations of temperatures on channelized and unchannelized portions of similar streams indicate that high-end temperatures may be increased by 4 or 5°F with diurnal fluctuation increases of up to 7 or 8°F in channelized portions. These temperature increases are worst case and would be expected only during low flows.

(3) None

- (4) House Document No. 554 (87th Congress, 2d Session) East Fork of the Trinity River contains several references of coordination between the City of Dallas and the Corps of Engineers regarding the expected interaction of Lake Lavon and Lake Ray Hubbard. The latest documentation of coordination between these two agencies is contained in the transcript of the 404 public hearing held in February 1977. The City of Dallas has encouraged the improvement of the East Fork water resources.

- (5) Projected treatment levels of 10 mg/l BOD, 15 mg/l TSS and 10 mg/l NH₃-N are predicted to result in periodic violations of the stream standard for dissolved oxygen (2 mg/l) without the project. With the project, however, it is projected that DO levels will generally remain above the effluent designated stream standard and, unless stream standards are raised, should not cause the State or EPA to require higher levels of treatment.

- (6) The District Engineer has directed that standard operating procedure for release of water from the Lavon Project will be based on a maximum flow of 2,000 cfs at the Grandall gate. For example, if local uncontrolled drainage produces a gate reading of 800 cfs then releases from Lake Lavon will not exceed 1200 cfs. The 2,000 cfs release procedure may be exceeded if the District Engineer finds it necessary in order to protect the safety of the public or to protect the integrity of Lake Lavon Dam and related works.

- (7) Initial clearing plans call for trees and brush to be cleared from the channel area and for 50+ feet back from each side of the channel. This clearing will open ground areas to more sunlight which will promote the growth of grasses, weeds, and vines. It will also permit more sunlight to heat the water flowing in the East Fork.

- (8) On-bow Lakes will be formed by the channelization. Each end of the stream cut-offs will be plugged with compacted soil so that water levels can be better maintained. These impoundments will contain ground water, surface runoff and overflows.

- (6) 1. How will water flowing at 5,000 cfs from Lake Ray Hubbard affect the "unimproved" (Increment II) portion of the East Fork between the lake and the proposed project area?
- (7) 2. Will the project require all trees and brush along the banks of the river to be removed? What impact will this cause on the physical environment?
- (8) 3. Will on-bow lakes be formed by the channelization?
- (9) 4. If on-bow lakes are formed, as seems to be indicated by the Draft EIS, will they stagnate, and if so, what precautions will be taken toward vector control?

E. Accuracy and completeness of the Draft EIS:

As part of the review of the Draft Environmental Impact Statement, the adequacy and completeness of the document must be assessed. The questions below do not appear to be adequately assessed by the East Fork Trinity River Channelization and Levee Improvement Draft EIS:

- (10) 1. Why wasn't there more detailed discussion about the possibility of using this area as an opportunity for recreational and open space enjoyment?
- (11) 2. Why, specifically, is one of the project goals 5,000 cfs water flow from Lavon Dam?
- (12) 3. What problems in flood control has the Corps experienced because of the current flow capacity of the East Fork?
- (13) 4. What was the methodology for determining the cost/benefit ratio?
- (14) 5. Are the benefits claimed based solely on the increased agricultural and grazing productivity of the land?
- (15) 6. Have the assimilative qualities of the flood plain been adequately compared against the gain of additional pastureland that would sustain 216 cattle?

- (9) It is expected that smaller, stagnate pools will be eliminated and that the larger oxbows will not become stagnate thus causing an overall improvement in vector control. The oxbows should contain better quality water and thereby support an aquatic fauna which will be unfriendly to vectors.
- (10) Because in a local flood protection project such as this the including of recreation is at the option of the local sponsors. The local sponsors elected to forego recreational development for public use. The discussion therefore was limited to the existing level of recreation experienced.
- (11) A controlled release of 5,000 cfs would increase the flood control effectiveness of Lavon Lake from 35 to 50 year frequency storage.
- (12) a. In the formulation and design stages for the Lavon Lake project, it was determined that the minimum channel capacity was 2,000 cfs. Subsequent encroachment by agricultural interests has reduced the channel capacity to as little as 600 cfs in localized areas. Attempting to regulate to lower discharges, when possible, extends the emptying time following each flood period.
 - (1) This extension results in higher initial lake levels for subsequent flood periods and an ultimate reduction in the magnitude of the maximum flood which can be controlled.
 - (2) The extension also creates problems for the levee districts which have accumulated upland runoff in the sumps. The inverts of the sluices through the levee are so low that, essentially, no outflow from the sumps can occur until the releases cease from Lavon Lake. The critically short inundation period which most plants and grasses can survive has required the Corps to shut off releases until sumps have drained, further increasing the likelihood of subsequent flood problems.
 - b. A lesser but still significant problem has been the effort required to create public understanding of the Corps' regulation problem. Scores of letters have been written to private citizens, to citizens' groups, to congressmen, senators, to newspapers and to other media. A public meeting was held to allow local input into the regulation process, but there is no solution which satisfies all.
- (13) The benefits credited to the project were measured based on damages which are experienced in the flood plain under existing conditions, less residual damages that would still occur with the proposed improvements in place. These benefits were then compared with the cost of the project to determine the benefit-cost ratio. Other benefits are from damages prevented to fences, roads, bridges, etc.
- (14) Damages prevented to cropland account for the major portion of the benefits claimed for the project.
- (15) Since the majority of flows are expected to stay within stream banks the assimilative effect of the flood plain is expected to be little used. When out of bank flood waters will receive some assimilation by the pasture as well as by the woodlands.



March 22, 1978

Mr. Jeff Harkinson
Director of Regional Services
North Central Texas Council
of Governments
P.O. Box CCG
Arlington, TX 76011

Dear Mr. Harkinson:

The following represents the City of Dallas comments on projects scheduled to be reviewed under the Metropolitan Area-wide Review and Comment (MARC) at the March 24, 1978, Executive Board meeting.

No response.

<u>Project Number</u>	<u>Project Name</u>
8-03-04035	East Fork Trinity River Channel Improvements

Comment: Favorable consideration of the project is recommended.

<u>Project Number</u>	<u>Project Name</u>
8-03-04001	Fairweather Project

Comment: Favorable consideration of the project is recommended.

<u>Project Number</u>	<u>Project Name</u>
8-03-04011	Treatment Alternatives to Street Crimes

Comment: Favorable consideration of the project is recommended.

<u>Project Number</u>	<u>Project Name</u>
8-03-04032	Special Investigations Unit

Comment: Favorable consideration of the project is recommended.

NCTCOG

MAR 28 1978

REGIONAL-SERVICES

Mr. Jeff Harkinson
Director of Regional Services
North Central Texas Council
of Governments
Page 2

Project Number Project Name
8-03-04039* Concern

Comment: Favorable consideration of the project is recommended.

Project Number Project Name
8-03-04039* EIS for Walnut Creek Valley

Comment: No adverse environmental impact is expected.

Thank you for the opportunity to comment on these projects.

Sincerely,


Bob Cleveland
Assistant City Manager

cr

No response.

* Your memos of March 3 concerning these two projects listed identical project numbers for them.

NCTCOG

MAR 28 1978

REGIONAL SERVICES



CITY OF MESQUITE

March 28, 1978

Colonel John F. Wall
P.O. Box 17300
Army Corp. of Engineers
Ft. Worth, Texas 76102

Dear Sir:

Re: Channelization and Levee Project on
the East Fork of the Trinity River

I am writing to voice concern regarding the proposed Increment I of the aforementioned project. It would appear based on what I have read that the project has questionable practicality from both an economic and ultimate completion (Increment II) viewpoint.

Firstly, the draft E.I.S. clearly states that the project is not economically feasible unless the Levee Impoundment is considered. No economic consideration is given to Increment II. It is possible that the entire flood control project is not economically viable if Increment II is considered.

Secondly, I seriously question the possibility of Increment II ever being completed which would allow for the stated goal of 5,000 C.F.S. release from Lake Lavan. The Corp has experienced a lack of cooperation from property owners in Increment II. In support of that experience, I would suggest that the City of Mesquite (which owns approximately one (1) mile of river bank) would not be interested in Increment II unless more data is presented to support same. The City plans to use the land it owns adjacent to the river for recreational purposes. As such, flooding does not have the same impact on recreational land that it would have on agricultural or commercial land. If the goal is 5,000 C.F.S., I question the value of spending millions of dollars on Increment I when Increment II is highly unlikely to ever be completed.

The City's long range plan for southwest Mesquite includes a statement of need for more open space and park land within the East Fork flood plain adjacent to that land already owned by the City.

Sincerely,

Gary Hooy
Director of Parks and Recreation

GH:fr
cc: Pat Lewis, C.O.G.

This letter was also received directly from the City of Mesquite and the formal response is on page II-44.



CITY OF MESQUITE

March 26, 1976

Colonel John F. Wall
P.O. Box 17306
Army Corp. of Engineers
Ft. Worth, Texas 76102

Re: Channelization and Levee Project on
the East Fork of the Trinity River

Dear Sir:

I am writing to voice concern regarding the proposed Increment I of the aforementioned project. It would appear based on what I have read that the project has questionable practicality from both an economic and ultimate completion (Increment II) viewpoint.

Firstly, the draft E.I.S. clearly states that the project is not economically feasible unless the Levee Impoundment is considered. No economic consideration is given to Increment II. It is possible that the entire flood control project is not economically viable if Increment II is considered.

Secondly, I seriously question the possibility of Increment II ever being completed which would allow for the stated goal of 5,000 C.F.S. release from Lake Lavin. The Corp has experienced a lack of cooperation from property owners in Increment II. In support of that experience, I would suggest that the City of Mesquite (which owns approximately one (1) mile of river bank) would not be interested in Increment II unless more data is presented to support same. The City plans to use the land it owns adjacent to the river for recreational purposes. As such, flooding does not have the same impact on recreational land that it would have on agricultural or commercial land. If the goal is 5,000 C.F.S., I question the value of spending millions of dollars on Increment I when Increment II is highly unlikely to ever be completed.

The City's long range plan for southeast Mesquite includes a statement of need for more open space and park land within the East Fork flood plain adjacent to that land already owned by the City.

Sincerely,

Gary Hogue
Gary Hogue
Director of Parks and Recreation

SH:fr
cc: Pat Lewis, C.O.S.

Calculations using preliminary data for Increment II show the entire project remains economically feasible (1.40 B/C Ratio) when including Increment II.

The East Fork Channel and Levee Improvement Project has the purpose of local flood protection. A portion of that protection involves providing the channel capacity to carry 5,000 cfs of flow from upstream impoundment releases in addition to the flow created by local runoff and still permit the drainage of lands protected by the levees.

The East Fork Channel and Levee Improvement is a part of the complete project to improve the East Fork and its tributaries as authorized in the River and Harbor Act of 1962. This portion of the project was incrementally justified when initially studied and formulated. It was still justified when the local sponsors in the lower region of the stream agreed to provide the necessary assurances. Economic justification remained even when construction began on Increment I in 1972.

Increment II has no local sponsor and the channel and levees in this reach of the East Fork will not be improved until such time as local interest supports such a project.

Recreational use of flood-prone lands is an ideal use and the City of Mesquite obviously has made that observation. With such compatible land uses as this in Increment II it may never be necessary to improve the channel and the rare or emergency need to release 5,000 cfs from Lavin Lake would cause little or no damage.



SIERRA CLUB

Southern Plains Regional Conservation Committee

P.O. Box 9069
Dallas, Texas 75205
March 26, 1978

Col John Wall, DE
Fort Worth District
USA Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102

RE: Draft Supplemental Environmental Statement for Lavon Dam and
Reservoir Modification and East Fork Channel Improvement

Dear Sir,

Thank you for the opportunity to comment on the draft supplemental environmental impact statement on the East Fork Channelization Project.

- (1) In section 4.01, the statement fails to discuss the damages that would occur from floods of a magnitude greater than the 50 year frequency the project is designed to protect. Oftentimes, structural flood control measures give landowners a false sense of security. If the structure is presented with a flood greater than its designed capacity, flood losses could be much greater because the structure may have stimulated development. How does the Corps or the local sponsor of the project expect to cope with such a scenario which is not unrealistic? Without some kind of land use controls, the Corps and the local sponsors have no guarantee such development will not occur.
- (2) Flood control structures will reduce the natural flooding patterns in the East Fork and downstream in the main stem of the Trinity River. This will cause a reduction in the natural flood storage capacity and may provide justification for further structural flood control measures. The statement fails to adequately discuss this aspect of the physical impacts of the project.
- (3) The statement states that "channelization will temporarily add to the total pollutant level of the East Fork," but fails to discuss the effects this may have on the downstream biota and users of water from the Trinity River.
- (4) In the discussion of ecological impacts, the statement fails to discuss provisions of executive order 11988, Flood Plain Management. It seems the document has failed to take this executive order into consideration in its planning processes.
- (5) The statement fails to mention or discuss any mitigation plan to compensate for fish and wildlife habitat losses. This project will cause a major negative impact on these resources. The

(1) If the project is designed and constructed to provide protection from flooding up to the statistical 50 year frequency, then damages will occur in the protected area when floods in excess of the 50 year frequency occur. For example, the entire 15,031 protected acres would be inundated by the Standard Project Flood. With or without structural flood control many people believe that nature will act in a way that would cause them no harm, i.e. "the odds against me being flooded are so great that I will take the chance of building here." Much of Corps flood protection work is the building of protective works for those areas which have already been developed - "retrofitting" in other words. Therefore, it may be presumptive to say that flood protection induces development. The public had a very valuable land use tool in the Flood Disaster Protection Act of 1973 whereby a federally insured mortgage loan could not be granted for construction of structures within the 100 year flood plain and whereby federal flood insurance could be obtained for structures already existing in the 100 year flood plain. Subsequent legislation reduced the effectiveness of this Act. The truth of the matter is that there is no guarantee of protection and there is no guarantee that development will not take place. If it is assumed that development is stimulated, then damages would be greater; however, flood damage prevention would be greater for the lower frequency floods.

(2) Natural flood storage is not being reduced as much as would be experienced in other channel and levee projects since levees already exist and are just being upgraded.

(3) The effects are expected to be negligible since the flow is expected to be low, allowing the suspended sediments to settle only a short distance downstream from where they were resuspended. Since the East Fork sediments and the Trinity mainstem sediments are of similar quality there will be no degradation. There are no commercial water withdrawals between the East Fork and Lake Livingston.

(4) The environmental setting section talks extensively of the flood plain in which the proposed work is to be conducted. The alternative methods of accomplishing the desired goals are discussed in Section VI and the protecting of from 2,430 acres to 2,975.5 acres of bottomland hardwoods from clearing, the creating of permanent onbow impoundments and extensive erosion control measures are ways that will minimize potential harm to be caused by project construction. The proposed project has been brought to the public's attention at a public hearing held at Wylie, Texas, on 22 January 1978; the final environment statement Lavon Dam and Reservoir Modification and East Fork Channel Improvement - filed with CEQ on 29 March 1971; the 404 public meeting held in Kaufman, Texas on 23 February 1977; and the draft supplement to the final environmental statement filed with CEQ on 24 February 1978. All of these coordination efforts have been given widespread exposure. The alternative of flood plain management or regulation was given due consideration and dismissed as not providing the needed structural advantage for draining the land side of the levee. All of the above information is contained in the Supplement and satisfies the requirements of EO 11988.

(5) The Corps has coordinated every planning and design effort with the US Fish and Wildlife Service. The Memorandum of Agreement to preserve the 2,000 plus acres of bottomland hardwood and the creating of onbows was initiated through coordination efforts with the US Fish and Wildlife Service.

Corps, in its failure to present a mitigation plan is in violation of the Fish and Wildlife Coordination Act and by its own regulations.

(6) In the discussion of nonstructural alternatives to the project, the document fails to delineate what the Federal expenditure of \$2.06 million was spent for. It is the presumption of the reader that the greater part of this expenditure has been for land acquisition. This expenditure is not an irretrievable commitment in that this land could be disposed of, thereby recouping the initial investment. However, it must be pointed out that just because \$2.4 million has been spent does not justify an additional expenditure of \$9 million. This is tantamount of investing more money into an economically poor investment.

(7) Because the design capacity of the levee system will be exceeded at times, what will be the average annual acreage protected and how long will lands be inundated once design capacity is exceeded?

(8) On page 1-2, the statement cites a benefit/cost of 0.55:1.00 at an unrealistically low discount rate of 3.425%. The project is able to achieve a greater than equity benefit/cost only when it is lumped with a much larger project than appears to have a favorable cost/benefit. How can the Corps justify such a deceptive juggling of the figures and projects?

(9) On page 1-1, section 1.03, the paragraph states that the contract with the U.S. Government and the project sponsors was terminated on 1 August 1975 with only 35% of the work completed. The impression is left to the reader that a new contract has not been consummated. The document that provides local assurances should be included in this document.

(10) On V-2, the document refers to a memorandum of agreement between the Corps and the local sponsors which is to include provisions which limit the amount of clearing. This memo was not included in the document. Therefore, the reader is unable to determine whether such an agreement adequately protects the resources. The Corps should fully disclose all pertinent information.

The Sierra Club has some very real reservations about the need for this project. On detailed examination, the project is not justified economically and the environmental impacts of the project far outweigh any benefits which the Corps anticipates may happen. The most attractive alternative to the project would be a comprehensive nonstructural plan which would incorporate the various tools available to the Corps, such as selective acquisition of land and flood easements, etc. The Corps should show a good faith effort with coming up with a nonstructural plan. Such plans have consistently proved to be more attractive economically and environmentally in other Corps projects.

Sincerely,

David Saxion
Howard Saxion, Regional
Vice President

(6) The Federal Government does not acquire any interest in lands associated with local flood protection projects such as Increment 1 of the East Fork. The \$2.4 million should have been \$3.4 million. This expenditure is not used to justify the additional expenditure but rather would be considered a loss if the project were not completed.

(7) Under existing conditions, the estimated average annual area flooded in Increment 1 of East Fork totals about 3,597 acres. Approximately 1,790 of these acres would be protected by the improved channel. Length of inundation has not been determined.

(8) Discount rates used in calculating benefit-cost ratios are set by Congress, given to water resources development agencies and used by the agencies' planners. The River and Harbor Act of 1962 (Public Law 87-874) authorized Lavon Dam and East Fork channel and levee work as one project. It has been carried on the books for appropriations as one project which had/has one benefit-cost ratio. It was broken out to demonstrate that it was incrementally justified at times in the past. It is not now incrementally justified but when considered as a part of the original project, the original project is still feasible.

(9) The contract terminated on 1 August 1975 was with a construction company, not local interests. The contract has no relationship with assurances. See Appendix C for copies of assurances from local sponsors.

(10) See Appendix B for copy of the Memorandum of Agreement.



League of Women Voters of Texas • Betty Anderson, President
1212 Guadalupe Suite 109 • Austin, Texas 78701 • Tel. 512/472-1100

April 10, 1978

Colonel John Hall, District Engineer
Corps of Engineers, U.S. Army
P. O. Box 17300
Fort Worth, Texas 76102

Dear Colonel Hall:

Thank you for the opportunity to comment on the Draft Supplement to the Environmental Statement pertaining to the East Fork Channel and Levee Improvement, Increment I.

We are most disappointed to read that the Levee-Channel project has been selected for implementation. In our view, the Statement clearly indicates that the project would not be in the public interest.

- (1) The economic impact of the Channel and Levee project is a major negative factor. Even when costs of the project are calculated at the outdated interest rate of 3-1/8%, only 55 cents in benefits would be received for each dollar spent (page 1-2). The annual excess of costs over benefits amounts to \$193,745. Over the 100-year amortization period, the project would result in a net economic loss of more than \$19 million. While this is a relatively small amount in relation to total federal spending, proceeding with the project would be contrary to the important national goal of reducing inflation.

We see no reason for including with the cover letter, and on page VI-2, calculations using excess benefits of the Lavon Lake Modification to justify the economic feasibility of the Channel and Levee project. In the Design Memorandum for the project costs and benefits were calculated separately from costs and benefits of the Lake Modification. We agree with the statement of the Chief of Engineers that work on the Increment I Channel and Levee project should proceed only if it is "separately useful and justified." (Design Memorandum No. 12, page 6)

Federal taxpayers would pay almost all of the \$11,370,000 cost of project construction. Kaufman County has paid for the only required "relocation" by building a higher bridge for a county road crossing the East Fork in the project area. Landowners directly benefiting from the project would contribute only land easements for project construction. Since these local sponsors have incurred no expenses toward project costs, the Corps should not feel obligated to proceed with construction if this course of action is not "separately useful and justified."

- (2) The adverse impacts on water quality are in conflict with goals of the Clean Water Act, as reaffirmed by Congress last year. The East Fork and the segment of the Trinity River into which it flows are among the state's most polluted stream segments. These effluent-dominated streams are not expected to meet goals of the Clean Water Act even after expenditure of more than \$200 million for sewage treatment plant improvements.

(1) See response to Sierra Club comment (8), p. IX-46. Increment I is an integral part of the authorized Lavon Dam Modification and East Fork Channel Improvement project. The discount rate is set by Congress at 3 1/8% for this project. While Increment I is not now separately incrementally justified, it cannot be separated from the rest of the authorized project without Congressional action (see detailed response below).

- (2) Water quality modeling studies conducted in response to this and other comments indicate that with the project, dissolved oxygen levels would be maintained or enhanced over present and projected conditions for the major portion of the reach affected. Dissolved oxygen is usually the most critical limiting factor to aquatic life in an effluent dominated stream.

- (1) The Environmental Statement indicates that, as a result of the proposed project, "dissolved oxygen levels may decrease to near 0.00 mg/l during low flow cycles due to the elimination of natural aeration mechanisms." (page IV-2) "Total dissolved solids concentrations of heavy metals, specific pesticides, coliforms, nutrients, and oil and grease" are present in the project area (page IV-1). A long-term effect of the project would be to cause such pollutants to "settle further downstream due to increased velocities and loss of flood plain assimilative qualities." (page IV-2) "Because the Trinity River downstream from the project is a municipal water supply, the negative impacts on water quality should be given very careful consideration."
- (4) Other long-term adverse impacts of the project include: lowered ground water levels during periods of low flow (page IV-3); damage to aquatic habitat (page IV-2); destruction of 37 acres of habitat for migratory waterfowl and other wildlife (page IV-5); diminished aesthetic quality (page IV-3); and consumption of large volumes of fuel in project construction (page VIII-1).

Moreover, the project will not accomplish the primary purpose for which it was authorized: to permit a greater degree of flood control capability in Laven Lake. Without channelization of the 21 miles of the East Fork immediately upstream from the Increment I project, releases from Laven cannot be increased. The fact that authorization for the upstream channelization (Increment II) expired in October 1977 should be included in paragraph 1.03. Also, the sentence in paragraph 6.02 implying that the project will "help meet" the goal of allowing increased releases should be omitted.

This paragraph, which discusses the "No Action" alternative, states that expenditures by Kaufman County and by the Trinity Valley Ranch for new bridges across the East Fork will be "lost" without the project. Surely there is some advantage to Kaufman County in having a bridge that is less frequently flooded than the old bridge, and an advantage to the ranch in having a link between its two land parcels where none existed previously. In discussing the "lost" federal expenditure of \$2 million, the paragraph should point out that benefits of the project are less than costs even when these "lost" dollars are excluded from the cost calculations.

Discussion of the "No Action" alternative might be expanded to include ways in which landowners could minimize future flood damages in the absence of a federal project, such as better maintenance of existing levees and planting of crops less susceptible to flood damage.

We urge that you re-examine the negative economic and environmental effects of the Channel and Levee project, balancing these against the single benefit of flood protection for agricultural land. We believe that you will conclude, as we have, that this project should not be constructed.

Sincerely,

Catherine Perrine
Catherine Perrine
Director, Water Resources

Another consideration: Is it in the national interest to spend federal dollars to protect increased farm production in a flood plain while billions of federal dollars are being spent to encourage decreased farm production? And when studies for the Water Resources Council project 27.5 million acres ("high export model") to 60 million acres ("base model") of surplus farmland in the U.S. in the year 2000? [Earl O. Heisdorf, Texas A&M Water for Food and Fiber Production Conference, 1976, Proceedings, p. 32]

(3) During low flow cycles dissolved oxygen levels also may decrease to 0.00 mg/l without the project. Modeling studies show no decrease in dissolved oxygen level attributed to the project due to truncation by the proposed drop structure except near confluence with the Trinity River. Long term effect of pollutants being carried further downstream are general effects of any channel-type project, and long term effects are largely unquantifiable and negligible.

(4) Noted.

(5) The Director of Civil Works, GCM, has determined that both Increment I and II are integral to the Laven Lake modification. Having been authorized incrementally neither can be separated from project authorization without Congressional action. The implication that the 2-year notice issued on 17 October 1972 is not valid and the withdrawal of Increment II cannot expire under the provisions of Section 202 of the Flood Control Act of 1962.

(6) The project will help meet the goal in that construction of a 5,000 cfs channel will not close the future option should increment II become useful and justified while providing increased local protection until that time.

(7) Admittedly there would be some advantage to having these new bridges, however, the flood control benefits would be minimal. It is true the benefits of the project are less than costs even when these "lost" dollars are excluded from the cost calculations.

(8) The greatest problem is not the ability of the levees to withstand high water levels from the East Fork but rather the inability of the water collected on the interior of the levee to drain out. This trapped water covers cropland for several days or several weeks and no known crop can tolerate flooding for this kind of duration. Therefore, alternate crops would not be a feasible alternative. In the case of the East Fork, channelization is the most practical method of flood protection.

(9) It appears that agricultural commodities are among the most desirable for foreign export. With the balance of payments in international trade going against the U.S., it may come to pass that economic experts can erode balance deficits through export of such commodities. The rate of inflation particularly in the construction industry would make this project even less economically feasible in the future.



National Wildlife Federation

1402 15TH ST., N.W., WASHINGTON, D.C. 20005

Phone: 202-737-6000

February 23, 1978

District Engineer
Fort Worth District
U.S. Army Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102

Dear Sir:

I am in receipt of a draft supplemental environmental impact statement on the East Fork Channel and Levee Improvement, Increment One, of the Lavon Dam and East Fork Channel Project.

From a reading of the supplement the following statements appear accurate: (1) The project involves approximately 32 miles of channelization (supp. EIS I-1) (2) the project area is preponderantly "low lying, flat and subject to inundation by flooding, with bogs, marshes and sloughs," including "about 3,000 acres of bottomland hardwoods (seasonally flooded)" -- i.e., wetlands (II-3); the benefit-cost ratio for this project, based on an incredibly low 3-1/8ths percent and a 100-year amortization, is .55 to 1.00 (I-2) (3) and there is no mitigation plan (at least no mention of one in the supplementary EIS). Please correct me if any of these statements are inaccurate.

If these statements, taken from your environmental statement, are accurate then you have a project which is thoroughly underserving of pursuit by your agency. (4) On environmental grounds, it is in contradiction to wetlands protection laws and regulations, policies, and policy statements applicable to and issued by the Chief of Engineers. From a fish and wildlife viewpoint, without a mitigation plan, it is apparently proceeding in violation of the Fish and Wildlife Coordination Act and NEPA. And from an economic and public interest point of view, the project is plainly unjustified by an almost two-to-one margin. (5) This deficiency cannot be remedied by associating the project with a larger project which happens to have a favorable cost-benefit ratio if, as the statement

- (1) The total authorized East Fork Channel and Levee Improvement project is 31.8 miles in length. Increment I of the authorized project, which this supplement features, is the lower 10.8 miles of the total authorized project for the channel and levee improvement.
- (2) The project area does have some scattered permanent and semi-permanent wetland areas.
- (3) The mitigation plan includes protecting from 2,430 acres to 2,975.5 acres of bottomland hardwoods from clearing and constructing several oxbow impoundments. The stream substrate is expected to be chemically enhanced and non-uniformities in the new channel should provide aquatic habitat.
- (4) The Chief of Engineers has stated that all measures will be taken to prevent alteration or destruction of wetlands which are important to public interests. He has a list of about seven functions which the wetlands should provide. The East Fork wetlands probably provide two of these functions and partially provide three others. Because of the flow regime and the expected evolution of the stream and adjacent lands after construction, the same functions as now experienced will be experienced in the future. The Corps is well aware of the value of wetland resources and is making every effort to protect these where possible and create others when there is an opportunity.
- (5) This project has always been associated with the larger overall project for development of the East Fork water resources and was authorized by Congress as such.

National Wildlife Federation

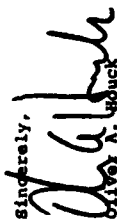
District Engineer
Ft. Worth District, COZ
Page 2

indicates, there is doubt that the larger one will go forward due to the absence of assurances by local project sponsors. Any way you look at it, on the basis of the impact statement the project is a loser.

The National Wildlife Federation recommends that at a minimum, the project be modified to include features which will ensure that wetland areas adjacent to this project will not be drained into project features. That an adequate mitigation plan be prepared and submitted to Congress covering anticipated losses for the entire project in advance of project construction; and that the District ensure that its decision to proceed with this project is not "arbitrary and capricious" by ensuring that whatever project it is determined to proceed upon produces benefits demonstratively in excess of cost.

Thank you for your attention to these views.

IX-50

Sincerely,

Oliver A. Houch
Counsel

QMS:hs

cc: Cecil Reid, Exec. Dir., Sportsmen's Clubs of Texas, Inc.
Robert E. Apple, Reg. Exec., NWF
Dr. George H. Hulsey, Reg. Dir., NWF
Brig. Gen. Drake Wilson
Division Engineer, Southwestern Division

(6) The project is so designed that wetland areas will be created which should help offset these expected to be lost. Existing wetlands will be protected where possible.

(7) Congress will have an opportunity to review the project and its anticipated impacts.

(8) The decision to go forward with this project in 1962 was based on sound reasoning. The need for the project has not diminished concurrently with the diminishment of the benefit-cost ratio. The social well-being and the economic stability of the people in the levee and utilities districts community will continue to worsen as subdivision development proceeds in the uncontrolled upstream areas. Benefits will not substantially change because land use in the project area will not substantially change but construction cost will continue to escalate, therefore, the economic benefits will never demonstratively be in excess of cost again.

AD-A087 602

ARMY ENGINEER DISTRICT FORT WORTH TEX
ENVIRONMENTAL STATEMENT FOR LAVON DAM AND RESERVOIR MODIFICATIO--ETC(U)
1977

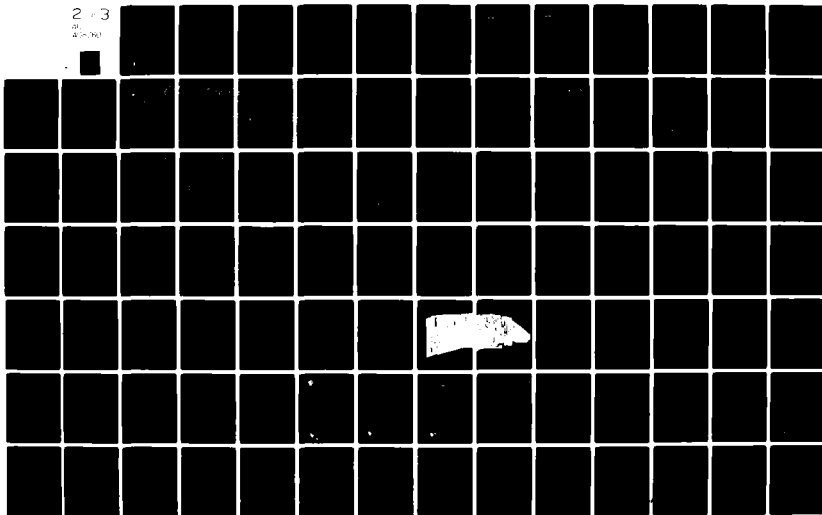
F/G 13/2

UNCLASSIFIED

NL

2 of 3

AD-A087 602





TEXAS COMMITTEE ON NATURAL RESOURCES
444 COCHRAN CHAPEL ROAD
DALLAS, TEXAS 75209
(214) 382-8079
April 2, 1978

District Engineer
Department of the Army
Fort Worth District
Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102

Dear Sir:

Enclosed are the comments of Texas Committee on Natural Resources on the Supplement to the Final EIS on East Fork Channelization.

In addition to these comments, we incorporate by reference the comments of the Sierra Club, League of Women Voters, U.S. Fish and Wildlife Service, and others.

Sincerely,

Edward C. Frits
Edward C. Frits, Chairman

ECF:edf

Encl.

Comments by the Texas Committee on Natural Resources on
Draft EIS by the U.S. Army Corps of Engineers
Increment I - East Fork of the Trinity

- (1) Flood plain management is not discussed as a unified whole. No operable plan is presented. No cost/benefit ratio is calculated for flood plain management.
- (2) Since water quality is expected to improve on the East Fork due to measures of the federal Water Quality Control Act Amendments, it can also be expected that more desirable fish will begin to inhabit the tributary, if unchannelized. This means that game fish would also lose future habitat with channelization. This should be mentioned in the EIS.
- (3) Since a portion of the Corps Project on the East Fork has been deauthorized due to lack of local sponsorship (Increment II), the effects of increased releases from Lake Lavon (from 2,000 cfs to 5,000 cfs) on the "unimproved" portion of the East Fork should be stated in the EIS.
- (4) The EIS fails to quantify the benefits of the project, except to the limited items on pages IV-487 (no money figures) and VI-2 (no explanation of how the totals were computed). Considering the small percentages of pasture and cultivated land (what crops?), the reader cannot determine how there would be as much benefit as claimed in VI-2.
- (5) On page II-2, item #2.07 contains inaccurate statement. Nonpoint discharge can be estimated. This EIS does not even estimate.
- (6) In discussing non-point and point sources of discharges on page II-2, item #2.07, biomass is not discussed.
- (7) On page II-5, item #2.28, it is not likely that after structural flood control, the project area would remain the same, as close as it is to Dallas, Texas.
- (8) On page IV-1, item #4.01, the following sentence is too vague: "Travel time of flows through Increment I will be reduced by about one-half hour, creating negligible change on any flood downstream." Figures should be given to support this statement.
- (9) On page IV-1, item #4.02, the statement fails to state how much erosion will enlarge the channel. On the Sulphur River, the channel was increased four times by erosion. This EIS fails to say how much erosion, siltation and increased flooding will occur downstream.
- (10) On page IV-1, item #4.03, again the statement fails to mention the effects on water quality of stirring up existing biomass pollution. It also fails to explain what effects channelization (elimination of natural cleansing) will have on water quality downstream, as well as how far the effects will occur downstream.
- (11) On page IV-2, item #4.07, the time length of low flow periods is not specified. It is substantial.
- (12) On page IV-3, item #4.09, the statement fails to quantify the influence the increased containment of floodwaters will have on the level of flood plain ground waters. Will the lowered ground water levels be only a local problem?

(1) Paragraph 6.03 discusses flood plain management. A benefit-cost ratio was not calculated for flood plain management.

(2) Loss of habitat to the repopulating aquatic community has been addressed in paragraph 5.08.

(3) The District Engineer has directed that 5,000 cfs releases will not be made from Lavon unless there is a need to evacuate a portion of the impoundment for public health and safety, or for structure safety. Should such releases be necessary, areas of Increment II will be flooded.

(4) Because of its volume we did not attempt to present the back up data used to compute these benefits. As mentioned on the Economic Data Sheet the full computations and back-up data are available for public review at the Fort Worth District Office.

(5) The North Central Texas Council of Governments states that the East Fork in Increment I is influenced primarily by discharge from 6 municipal wastewater treatment plants. NCTCOG studies estimate that non-point sources of the immediate watershed contribute 7% of the phosphorus and 14% of the nitrogen load to Increment I.

(6) This paragraph has been changed to show that 21% of the present BOD5 load and 97% of the sediment load is from non-point sources within the watershed.

(7) No plans for development in Increment I by any entity or individual surfaced during our studies.

(8) The following calculations explain the small increase in flow or travel time expected:

Discharge	Existing Condition Velocities ft/sec	Improved Condition Velocities ft/sec
76,000	6-7	6-8
45,000	4-5	4-7
10,000	2-3	2-5
5,000	2-3	2-3
2,000	2-3	2-3

(9) The type of soil in the lower East Fork (clays) should be able to resist erosion for velocities up to 8 feet/sec. The channel is presently stable for the most part and the improved or excavated channel is expected to be stable also. Erosion is not expected to be a serious problem.

(10) These effects are mentioned in paragraphs 5.05 and 5.08. The quality of water downstream from the construction activity will be degraded by suspended materials. How far downstream this degradation will extend is a function of flow velocities. Since the flow is expected to be low the suspended materials are expected to settle out after only a short distance.

(11) Stream flow data is presented in Table 6 of Appendix I.

(12) Effects on ground water are expected to be slight and localized, primarily to the upper portions of Increment I.

- (13) On page IV-3, item #4.10, the statement fails to quantify to what extent the ground water level will decrease in the upstream portion of the study area during periods of low or normal flow.
- (14) On page IV-4, item #4.14, the statement fails to estimate the amount of wildlife that will be displaced both directly and indirectly due to the clearing of the right-of-way (removal of 37 acres of bottomland woodlands).
- (15) On page IV-5, item #4.19, the statement fails to say that some species of fish and aquatic vegetation will never return, especially sport fish. Others will be decimated. The EIS should quantify the effects on aquatic life due to increased heat and lower dissolved oxygen levels caused by channelization.
- (16) On page IV-6, item #4.25, the statement is misleading. It fails to compare which grasses would grow on the river bottom before and after structural flood control. Fescue is suitable for grazing and withstands several days of flooding; and therefore, it is suitable for grazing without the project. Other grasses are also in heavy use without the project.
- (17) On page IV-7, item #4.26, the statement fails to explain how the figure of \$4,024,900 was computed.
- (18) On page IV-7, item #4.27, the statement fails to specify whose incomes would be spent in the area of the project. For example, construction workers might commute from a substantial distance.
- (19) On page IV-7, item #4.28, the statement fails to show ^{that} the new bridges would otherwise not have been built. What were the heights, ages, and conditions of the old bridges?
- (20) On page IV-8, item #4.29, the statement fails to quantify the present grazing use, in head of cattle, which is considerable, and likewise commercial. A large tree nursery is also presently in the floodplain.
- (21) On page IV-8, item #4.30, the statement fails to describe what type and quantity of construction is expected along the levees of County Road 3039 crossing.
- (22) On page V-2, item #5.05, the phrase "as much as possible" must be quantified.
- (23) On page V-2, item #5.08, "slight increases in temperature" resulting from clearing of the channel right-of-way and removal of trees should be quantified. The results of this increase in temperature should also be quantified.
- (24) The Army Corps of Engineers should not contend that the entire expenditures thus far would be lost. The first contractor bugged down his dragline near the mouth of the East Fork and lost his shirt.
- (25) On page VI-1, item #6.02, an explanation is not given on what the federal government invested \$2,669,000 on. This investment should be itemized.
- (26) On page VI-1, item #6.02, The flooding river leeches salts out of the soil column, provides new organic matter that is natural fertilizer. Not only will the stream ecosystem be adversely affected. What is the total cost of artificial fertilizer that will be applied to the croplands in question, i.e., will it nearly equal \$120,000? Is there really a necessity for these capital "improvements"? Is the impact of wearing an ecosystem worth \$2,376,000.00?

- (13) Variability of climatic conditions and consumptive uses make quantification uncertain.
- (14) There has been no quantification of the amount of wildlife expected to be displaced by the clearing of the remaining 37 acres of bottomland woodlands in the project construction area. The overall impact of displacement will be relatively insignificant since the construction area should provide "edge effect" to the approximately 2,430 acres of dense woodland and brush which will be under the protection of the Memorandum of Agreement referenced in Section V and VII and printed in full in Appendix B.
- (15) This discussion has been made in paragraphs 4.19 and 5.08.
- (16) This paragraph has been revised to clarify that additional pasturage will be made available for grazing with the project. This pasture would provide forage additional to that which was used by cattle prior to clearing.
- (17) The items that make up the figure of \$4,024,900 are as follows: Flood Control \$236,800; Recreation \$1,768,300; Water Supply \$2,019,800. This number related to flood control, recreation and water supply benefits of the total project. The new Summary of Economic Data Sheet shows this data.
- (18) Noted. Economic benefits of construction activities could be diffused to a large area.
- (19) New bridges would not have been built and were necessary to follow the proposed alignment of the new channel, i.e. the centerline of the new bridges corresponds to the centerline of the proposed new channel. The heights and ages of the bridges are not known, but they were in good condition and in use.
- (20) This statement is primarily concerned with impacts of the natural aesthetics of the area by the proposed project. Fluctuation of herd sizes make quantification difficult.
- (21) Construction may be with dredge, dragline and other earth moving equipment. The channel will have an 80-foot bottom width with 1 on 3 side slopes resulting in about a 7 foot cut in the vicinity of F to H Road 3039 crossing. Excavated material will be used to raise and strengthen existing levees.
- (22) Specifications and controls on the amount of clearing are written into the "Plans and Specifications" document which accompanies the construction contract. This document limits clearing "as much as possible" while allowing for implementation of engineering design features.
- (23) Studies on similar projects in other areas indicate that worst case projections for temperature increases could be up to 4 or 5°F on the high end with increases in diurnal fluctuation of up to 7 or 8°F. These increases would be expected to occur only during low flow and should not, in themselves, be limiting to the aquatic system considering natural climatic extremes of the area.
- (24) Noted.
- (25) The total investment incurred to date by the Federal Government is \$2,836,000. This investment includes construction costs of \$1,218,000 and \$847,000 for channel and levees, respectively, incurred on the original contract which was terminated. The remaining \$791,000 consists of expenses by the Corps for engineering and design, plans and specifications, surveying, coordination, public meetings, supervision and inspection of construction, etc.
- (26) Flooding agricultural lands with sewage effluent on a timely basis would in essence be an "induced Kala effect" and would take advantage of a currently unused resource. The problem on the land is not the lack of water, but the lack of oxygen, i.e. crops are inundated and thereby lost. The aquatic system is fully expected to be severely set back but certainly not wasted. The terrestrial ecosystem will encounter some conversions.

- (27) On page VI-1, item #6.03, it is not explained how the agricultural productivity of the area would be reduced through floodplain regulation. Since it is already flooding, how can present agricultural use be decreased by conditions that they have been operating under for sometime?
- (28) On page VI-3, item #6.06, the statement fails to discuss the alternative of coordinating releases with Lake Ray Hubbard (City of Dallas). The statement also fails to discuss what effects the increased releases from Lake Lavan would have on the main stem of the Trinity, below the East Fork. Increased flooding downstream on the main stem of the Trinity should be quantified, and so should the possible flood damages.
- (29) On page VI-3, item #6.09, the statement fails to mention that environmental damages would be much less with levee modification, alone.
- (30) On page VI-4, item #6.11, the statement fails to discuss to what extent the effectiveness of Lake Lavan would be reduced if remained restricted to 2,000cfs. Why was the Lake built as it is, without providing for cost of channelization? Was this cost acknowledged in the original benefit/cost ratio when the Corps proposed constructing Lake Lavan?
- (31) On page VIII-1, item #8.01, the statement should describe the old project and compare it in scope to the proposed project. Since the Corps of Engineers is cutting across oxbows in the new proposed project, it appears that the proposed new channel is shorter than the old. Was the old channel merely a deepening or snaggings, with little effect on vegetation or natural cleansing processes?
- (32) How much energy in btu's will be lost in this Project in:
1) producing the fuel itself;
2) transporting workers to and from the area;
3) producing the equipment to transport workers and material and to construct the channel; and,
4) maintaining the channel and levees.
When these losses are considered, cumulatively, with all similar projects around the nation, what would be the effect on the national energy problem?
- (33) On page A-1-2, the statement discusses the fact that the soils in the proposed project area are best suited to pasture. So why does the Corps suggest that there might be a shift from pasture use to cropland use as a result of the proposed project?
- (34) On the Table 2, page A-1-8, one figure is underlined, indicating that this value is above EPA screening levels. The statement fails to discuss how this value is a severe threat to health.
- (35) The statement fails to analyze the extent to which soil samples for heavy metals, etc. exceed federal standards, and to discuss their effect on health.
- (36) On page A-1-24, the statement fails to discuss the violation of federal criteria on many categories.
- (37) Also on page A-1-24, the statement fails to discuss the effects of these levels in each category on human health, in relation to the project:
a) stirring up the pollutants;
b) reducing the purifying effects of the natural channel, i.e., riffles, shads, oxygenation.

- (27) Flood plain regulation would likely relegate the existing levee system to fall into a state of continuous ruination creating breaks which would permit higher frequency flooding. This would cause a decrease in agricultural usage of the area.
- (28) There is an operation plan which coordinates releases from the flood pools of the many reservoirs in the Trinity basin to try to keep flows on the mainstem of the Trinity River within banks. Lake Ray Hubbard does not have a flood control pool and once having been filled to operating capacity will have excess water flowing over its uncontrolled spillway. There should not be any more flood damages on the mainstem Trinity because of the East Fork Channel and Levee Improvement Project.
- (29) The following paragraph (6.10) make such a statement.
- (30) Lake Lavan's effectiveness would not be reduced if the channel remains at 2,000 cfs but it would be enhanced if the channel is increased to 5,000 cfs. This channel portion of the East Fork authorization was designated as a local flood protection effort to permit those local interests, who would reap most of the benefits, share in the cost of its construction. This was the method of saving a portion of the taxpayers' money. The federal share of the construction cost was included in the original benefit cost ratio.
- (31) The original project, undertaken in 1919, consisted of diverting the East Fork into White Prairie Slough in the vicinity of the confluence of Buffalo Creek with the East Fork. White Prairie Slough was diverted into Johns Slough which was a tributary to the mainstem of the Trinity River. Clearing and snagging was part of the original project. Therefore, the effect on vegetation most likely occurred immediately. The proposed project will easily have more effect on the area biota than the original project did. The existing stream is 10.8 miles long (paragraph 1.03) and the proposed project will have a stream 9.78 miles long (paragraph 4.06), a loss of about 1 mile or 10% of stream channel.
- (32) Many btu's will be expended in the energy web of this project. The effect will be the expenditure of non-renewable energy resources and a minus-cule increase in the international balance of trade deficit.
- (33) Privately owned lands are not always put to their highest and best use. Row crops generally return more income on the investment than pasture does.
- (34) This value could be an anomaly because of (1) its magnitude compared to the rest of the sites, (2) the relative consistency of the readings at other sites and (3) lack of replication. Assuming that the high reading is correct, the mercury being closely attached to silt particles, would be released into the water column during construction caused sediment disturbance in the construction area. Most of the mercury contaminated soil would be contained behind dikes as dredge material. That which became resuspended would quickly settle out downstream. The concern with heavy metals such as mercury is biological magnification where each level of the food chain accumulates the metal from organisms in its diet. With mercury laden soil and silt removed from the channel in the first level of the food chain, such as the bottom dwelling mussels, will not be able to accumulate as large amounts as would have previously been possible. Mercury poisoning causes severe neurological disorders. Cleaning up the East Fork would work toward removing the possibility of this danger.

- (38) On page A-1-44, the statement fails to discuss why the general taxpayers, rich and poor, should pay to improve the land for 50 landowners, especially for the three largest and wealthiest landowners.
- (39) On page A-1-49, under the section on recreation, the statement fails to discuss the future potential of the area in recreation (without the project), such as fishing and canoeing, if water quality improves as projected under current sewage treatment plant improvement plans.
- (40) On page A-1-51, the statement does not discuss the chances of housing development in the project area in the future.
- (41) The EIS fails to contain the comments of public and/or governmental agencies.

- (35) The extent of exceedence of federal standards by the soil and sediments samples for heavy metals, etc., can easily be determined by subtracting the values determined for each factor from the screening level (ppm) given at the bottom of each column in Table 1 on page A-1-5. Paragraphs 4.03, 4.04, 4.05, 5.05 and 5.08 discuss what is likely to happen to fugitive water pollutants. Their effects on the health of plants and animals could fill several volumes.
- (36) The discussion on page A-1-24 is an attempt to generally characterize the ambient quality of East Fork water. A full discussion of criteria violation would add nothing to the technical appendix except verbiage.
- (37) Appendix A is a technical or information appendix and evaluation such as mentioned and are to be found in the body of the supplement.
- (38) The US Government works for rich and poor alike. Taxes are collected by our Government; and the population, through their elected representatives, indicates the programs which they wish to have authorized and funded. The democratic process espouses that the will of the majority be done. Obviously the majority is not always self centered and thereby provides that some tax monies be expended in several places to help smaller groups receive amenities. Thus 50 landowners along the lower East Fork are receiving federal assistance in improving their ability to earn a livelihood and thus improve their ability to pay taxes into the same system which will in turn help others.
- (39) The future potential for recreation without the project will remain as it is today assuming that lands remain in private ownership. The habitat is expected to be better which may help offset the expected decline of aesthetics as discussed in paragraph 4.24.
- (40) Because the project provides statistical 50-year protection, housing developments are unlikely to appear in the protected area. In the search for information to prepare Section III, no plans for subdivision developments were disclosed.
- (41) Public and/or government agencies normally comment on draft documents and their comments and action agency responses appear in final documents such as this one.

FLYING A RANCH

P. O. BOX 12, ROSSER, TEXAS 75157
TELEPHONE: A/C 214 • 486-3561

March 2, 1978

RECEIVED
JAN 10 1978
U.S. ARMY
ENGINEER CENTER

AMERICAN RANCH
ASSOCIATION
TEXAS POLLED HORN
ASSOCIATION
MIDWESTERN RANCH
ASSOCIATION
TEXAS AND SOUTHWESTERN
CATTLE RANCH ASSOCIATION
AMERICAN RANCH CATTLE
ASSOCIATION

Mr. D. L. Mills - SWED-PR
Department of the Army
Fort Worth District
Corps of Engineers
P. O. Box 17300
Fort Worth, Texas 76102

Dear Mr. Mills:

Thank you for sending the copy of the Draft Supplement to the Final Environmental Statement pertaining to Increment I of East Fork Channel and Levee Improvement. Let's get rolling! Bring on the bulldozers!

On pages IV-8 and A-I-50 reference is made to an archeological site which sounds as though it may lie on my property. This is the first time I have heard of such a thing. Please be kind enough to send as much further information as you can on this matter. It sounds fascinating!

(1) Regarding the supplement, it seems to me that the benefit to cost ratio should properly be calculated using only the new costs and forgetting about what has already been expended. In table VI-1 the No Action option ignores the prior expenditure of \$2,376,000 while the other options include it. If Levee and Channel stated cost of \$11,370,000 were decremented by prior expenditures, the benefit to cost ratio would increase from 0.55 to 0.6953. This should tend to increase project viability.

(1) The prior expenditure of \$2,376,000 in the report was in error and is corrected to read \$3,376,000. Admittedly the benefit to cost ratio would be 0.73 assuming prior funds expended are considered as "sunk costs." This, however, would not result in a change in the economic viability of this plan since the benefit-cost ratio must normally be 1.0 and above to be a justified plan.

Yours sincerely,



Fred F. Alford, Jr.

FFA:ln

United States
Environmental Protection
Agency

Region 6
1201 Elm Street
Dallas TX 75270

Arkansas, Louisiana,
Oklahoma, Texas,
New Mexico



October 24, 1978

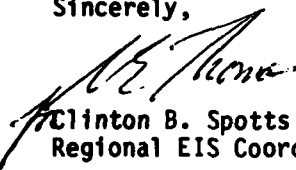
Colonel John F. Wall
U.S. Army Engineer District
P.O. Box 17300
Fort Worth, Texas 76102

Dear Colonel Wall:

The Environmental Protection Agency has received the Final Supplement to the Final Environmental Statement regarding Increment I - Channel and Levee Improvement East Fork Trinity River, Kaufman County, Texas.

We regret that we will be unable to respond within the established review period. We expect to respond by November 24, 1978. Please accept our apologies for this delay.

Sincerely,


Clinton B. Spotts
Regional EIS Coordinator (6ASAF)

United States
Environmental Protection
Agency

Region 6
1201 Elm Street
Dallas TX 75270

Arkansas, Louisiana,
Oklahoma, Texas,
New Mexico



November 15, 1978

Colonel John F. Wall
U.S. Army Engineer District
P.O. Box 17300
Fort Worth, Texas 76102

Dear Colonel Wall:

Review of the Final Supplement to the Final Environmental Statement regarding Increment I - Channel and Levee Improvement East Fork Trinity River, Kaufman County, Texas, has been completed. The Final Supplement was found to be satisfactory within EPA's area of jurisdiction and expertise.

We appreciate the opportunity to review the Final Supplement to the Final Environmental Impact Statement.

Sincerely,

Harlene Crosby

per Clinton B. Spotts
Regional EIS Coordinator (6ASAF)

APPENDIX A

**ENVIRONMENTAL SETTING AND
HISTORY OF COORDINATION**

APPENDIX A-I

EAST FORK ENVIRONMENTAL SETTING

PHYSICAL SETTING

Physiography. The valley of the Lower East Fork of the Trinity River is located within the Blackland Prairie physiographic province. This province extends across the state from the Rio Grande valley in the south to the Red River Valley on the northern border. In North Central Texas the Blackland Prairie lies between the Eastern Cross Timbers-Grand Prairie provinces to the west and the forested Post Oak Province to the east. At the project site this physiographic province is about 70 miles in width and is characterized by gently rolling low hills.

The topography of the Lower East Fork flood plain is relatively level. The Lower East Fork of the Trinity River lies in a broad river valley bordered on the west by gently rolling hills which rise about 100 feet above the flood plain. Elevations of the river flood plain bottom range from 352 msl (above mean sea level) in the north near the Texas and New Orleans Railroad Bridge to 337 feet msl at the mouth of the East Fork. Sand Hill, rising to an elevation of 383 feet msl above the 340 foot river bottom is the only predominant topographical feature within the low flood plain. Rolling hills west of the project area reach maximum elevations of approximately 420 feet msl at Combine and 372 feet msl at a location along White House Ridge south of Trinity Valley Ranch. Elevations between 350 to 430 feet msl extend along the hills bordering major expanses of the west side of the river.

The project area lies in a broad flood plain measuring approximately two miles across. Prior to initial channelization and levee construction of the lower East Fork, the river followed a meandering streambed located approximately one mile east of the existing river. This Old East Fork of the Trinity River comprises part of the general slough areas across the flood plain from Little Buffalo Creek to the vicinity of Rosser where it joins with the Trinity River mainstem. Part of the slough system within the broad East Fork flood plain is comprised of Pecan Slough and Ezell Slough, both shallow water areas with dense vegetation of large pecan trees and other hardwoods. Together with the Old East Fork of the Trinity, these sloughs serve to collect runoff from the agricultural lands of the levee protected area and eventually terminate at the Trinity River mainstem.

Geology. The bedrock underlying the project site is composed of members of the Taylor group of the Gulfian series which is of Upper

Cretaceous age (70 to 90 million years). Primarily, the formations are as follows:

Upper Taylor Marl - A calcareous grey clay or soft shale which becomes white where exposed to the weather. It is soft and plastic when wet but has a hard chalky appearance when dry.
Wolfe City Marl - A sandy calcareous clay with layers of hard sandstone, black shale and scattered phosphatic nodules.
Lower Taylor Marl - An unconsolidated dark grey calcareous clay which becomes medium grey to tan when exposed to the weather. It is firm and hard when dry but disintegrates to mud when wet.

Owing to the regional inclination of the rock strata, the Lower Taylor generally outcrops on the west side of the flood plain with the Upper Taylor exposed on the east side. The Wolfe City member generally underlies the lower East Fork flood plain. There are minor local variations in the direction and amount of inclination of the strata and occasional faults with displacements of a few feet. With the exception of minor amounts of sand, gravel and clay, there are no known economic mineral deposits in the project area

Soils The flood plain soils of the lower East Fork belong to the Kaufman, Trinity, Tuscumbia association. These are soft calcareous clayey alluvial soils which have very poor internal drainage. The natural vegetation is hardwood forest, but the soils will support crops and pasture where other conditions permit. The soils of the surrounding uplands are of the Houston Black, Heiden, Austin association. These are firm calcareous clay soils with low permeability except when dried to the point of crack formation. The natural vegetation is tall prairie grass, and the soils are best suited to pasture.

As part of the initial phases of planning and construction for Increment I, core samples were taken in the study area. A total of 15 cores were taken along the center line of the planned channel, and 16 cores were taken along the centerline for the levees. Generally, results of the corings indicated that the soils of the levees are comprised of highly plastic clay of soft to medium consistency. The foundation soils are similar to the soil of those of the levees and contain occasional lenses of organic matter. Many of the soils within the foundation of the levees contained slickensides. Sandy clays with occasional gravel were encountered in the overburden of a few cores. Primary material found consisted of weathered and unweathered clay shale.

Soil along the line of the proposed channel consists of highly plastic clays with consistency varying from soft to medium. Plastic limits ranged from 20 to 29 while liquid limits ranged

from 72 to 111. Shale encountered below these soils was of light consistency and can easily be removed by excavation. A typical boring along the proposed channel center line within the river-bottom is shown on figure 1.

Chemical properties of channel and flood plain soils and sediments soil and sediment samples were collected from potentially affected areas such as existing stream channels, proposed channel relocation sites and excavation disposal areas, and analyzed for heavy metals, total organic carbon, Kjeldahl nitrogen, bacteriological quality and pesticides. All samples were collected during the Spring of 1976. Results of these analyses are contained in table 1. Sampling station locations are shown in figure 2. All samples were analyzed using procedures outlined in either "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association, Inc. 1971) or "Chemistry Laboratory Manual: Bottom Sediments" (Environmental Protection Agency, Great Lakes Region Committee on Analytical Methods 1969).

Heavy metals analyses showed no distinct differences in concentrations between sediment samples from the existing channel and soil samples from the flood plain near the channel, with the possible exception of mercury. Mercury concentrations in the two sediment samples (one each from station Nos. 7 & 8) were approximately four times greater than the overall average of mercury concentrations in the soil samples. The probable reason for these results is the greater instability of mercurial compounds as compared to other heavy metals. Results of Kjeldahl nitrogen analysis on soil and sediment samples showed sediment samples to contain slightly higher concentrations than soil samples, while total organic carbon analysis showed sediment samples contained approximately twice the concentrate of organic carbon as soil samples.

Results of coliform testing on soil and sediment samples indicate a substantial number of coliforms (fecal and total) exist in both the river sediments and adjacent flood plain soils due to wastewater treatment plant effluents. Fecal coliform levels in sediment samples were an order of magnitude greater than those in soil samples, while total coliform levels were approximately twice as great in sediments than those of soils.

Levels of specific pesticides were determined in soil and sediment samples. Pesticides analyzed were DDT, Dieldrin, Endrin, Heptachlor and Lindane. Only DDT was detected in significant amounts in the two sediment sampling sites, Nos. 7 & 8 (4.2 mg/kg and 21.6 mg/kg, respectively). Scattered amounts of other pesticides were detected ranging from 0 -.3 mg/kg. No distinct trends were detected in the distribution of pesticides other than DDT in soil and sediment samples. DDT concentrations in soil samples were generally below detection limits. Oil and grease analyses indicate that sediments may contain levels an order of magnitude greater than soil samples. Sediment oil and grease

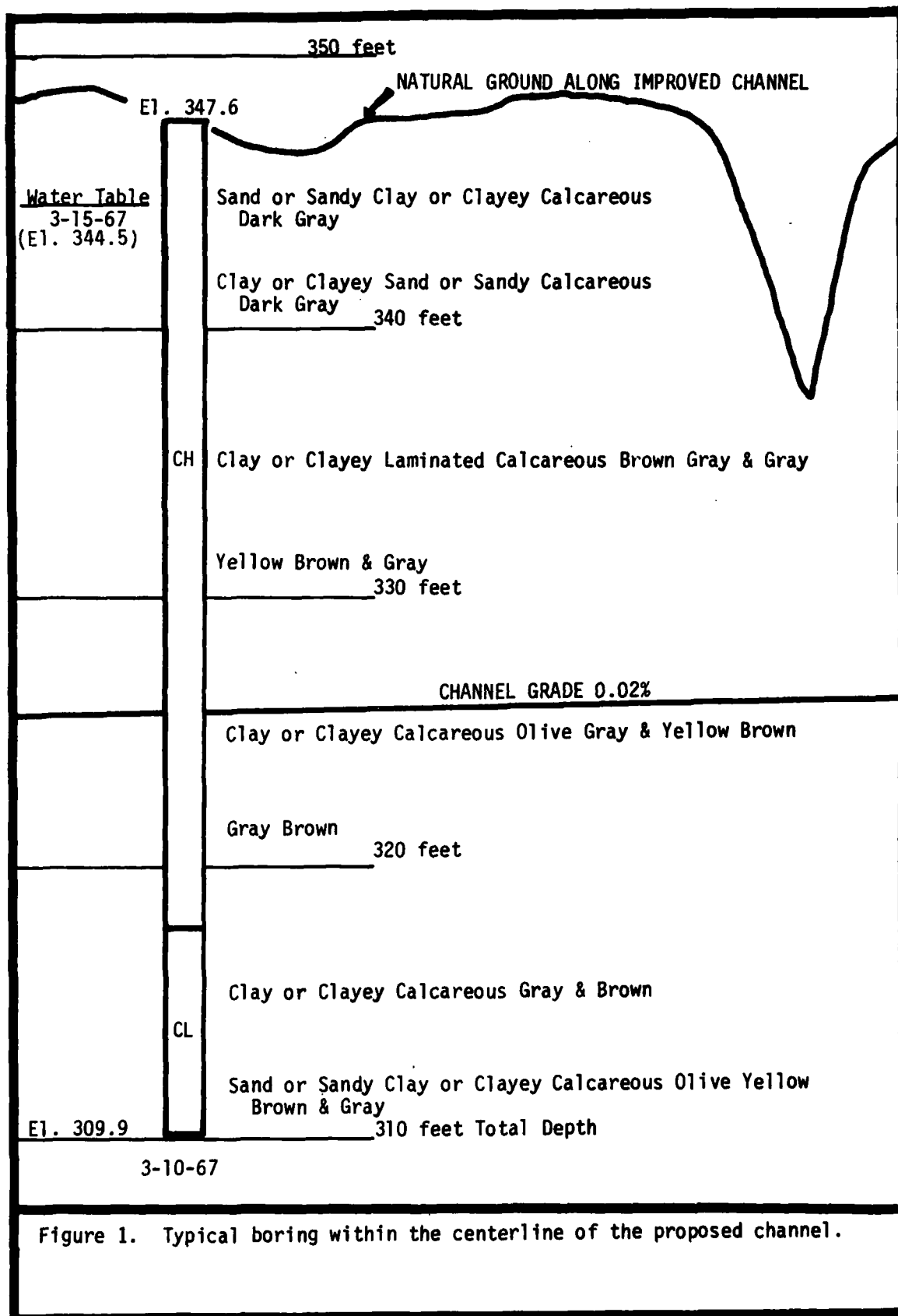


Figure 1. Typical boring within the centerline of the proposed channel.

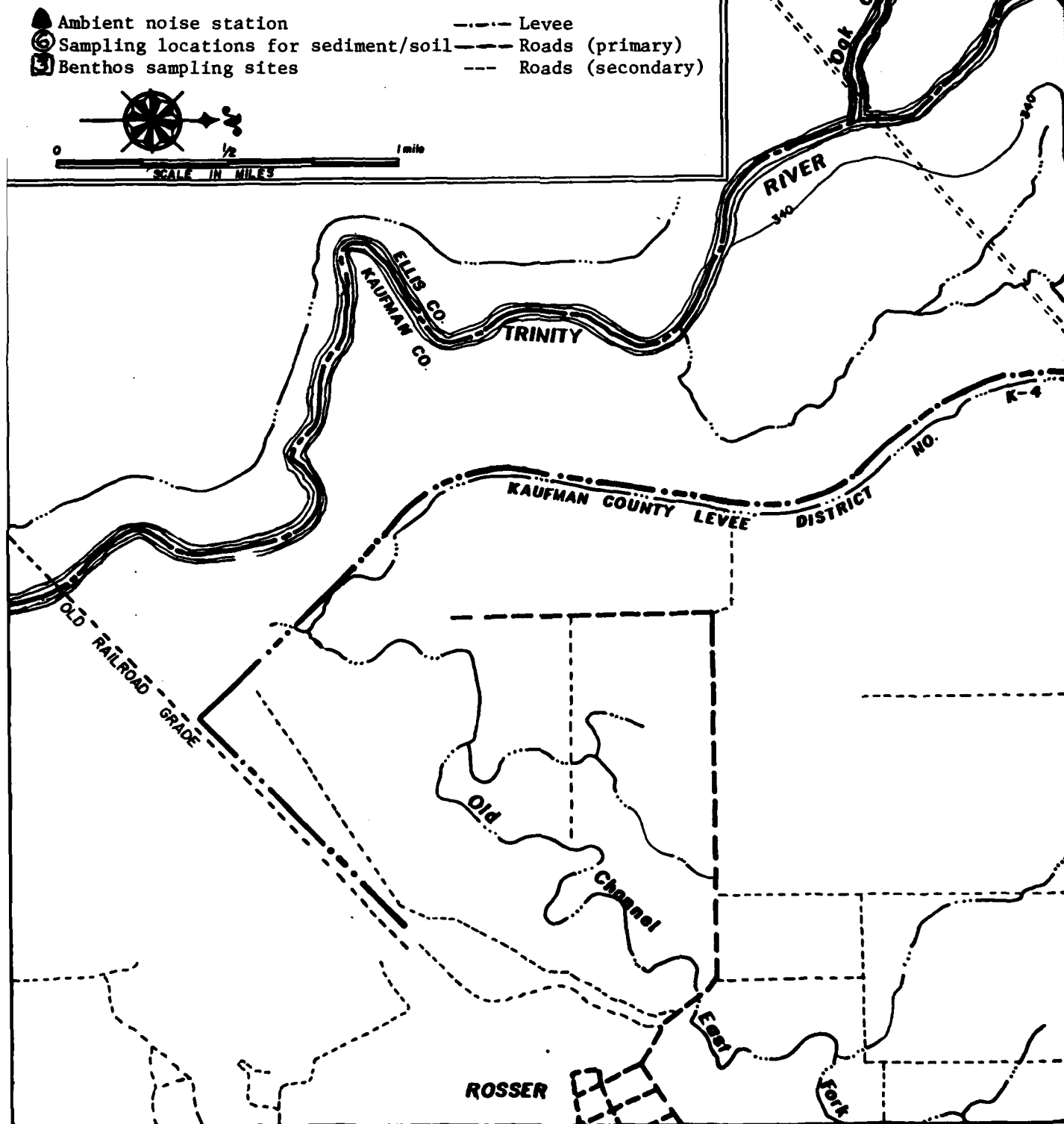
TABLE 1 RESULTS OF ANALYSES OF SOIL AND SEDIMENT SAMPLES FOR VARIOUS POLLUTANTS
SAMPLES TAKEN FROM EAST FORK, TRINITY RIVER FLOOD PLAIN

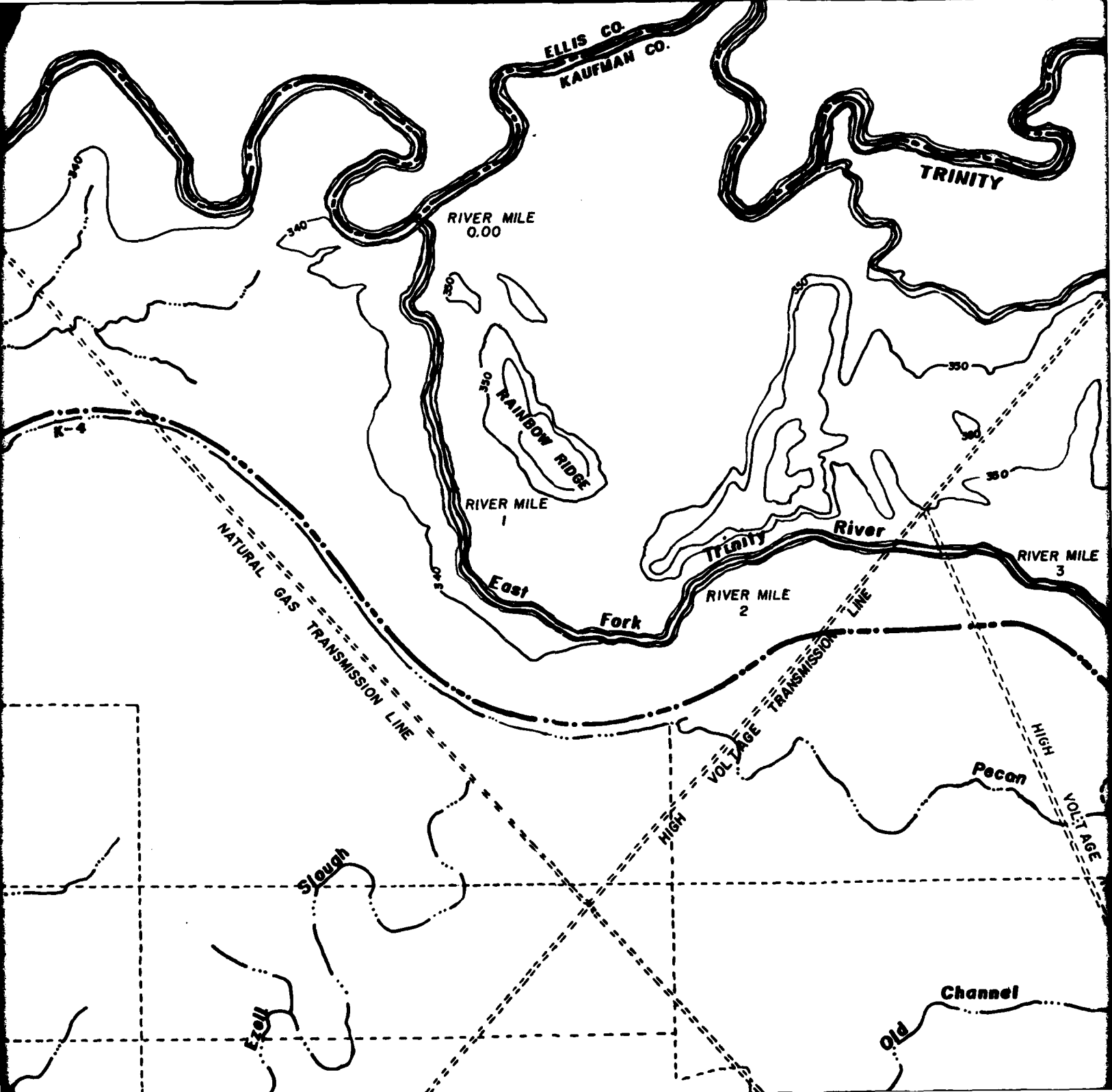
Sta- tion	Cd (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Mn (mg/kg)	As (mg/kg)
1	<u>3.78</u>	<5.0	43.0	10	0.013	92.0	<u>100.55</u>	423.5	7.60
2	<u>6.55</u>	<5.0	57.5	9	0.003	69.0	<u>83.25</u>	452.2	15.40
3	<u>6.37</u>	<5.0	72.0	28	0.009	80.5	92.9	574.7	9.90
4	<u>2.22</u>	<5.0	36.0	22	0.005	81.0	<u>66.75</u>	432.3	7.60
5	<u>2.35</u>	<5.0	72.5	27	0.009	113.5	<u>108.25</u>	487.3	9.33
6	<u>1.65</u>	<5.0	55.5	14	0.002	59.5	<u>98.4</u>	358.8	7.86
7	<u>2.95</u>	<5.0	43.5	32	0.030	82.5	<u>104.9</u>	359.2	8.75
8	<u>3.00</u>	<5.0	105.0	28	0.033	58.8	<u>94.75</u>	328.5	9.90
Screening levels (ppm)									
2.0		100	50	50	1.0	50	75	200-600	5.0

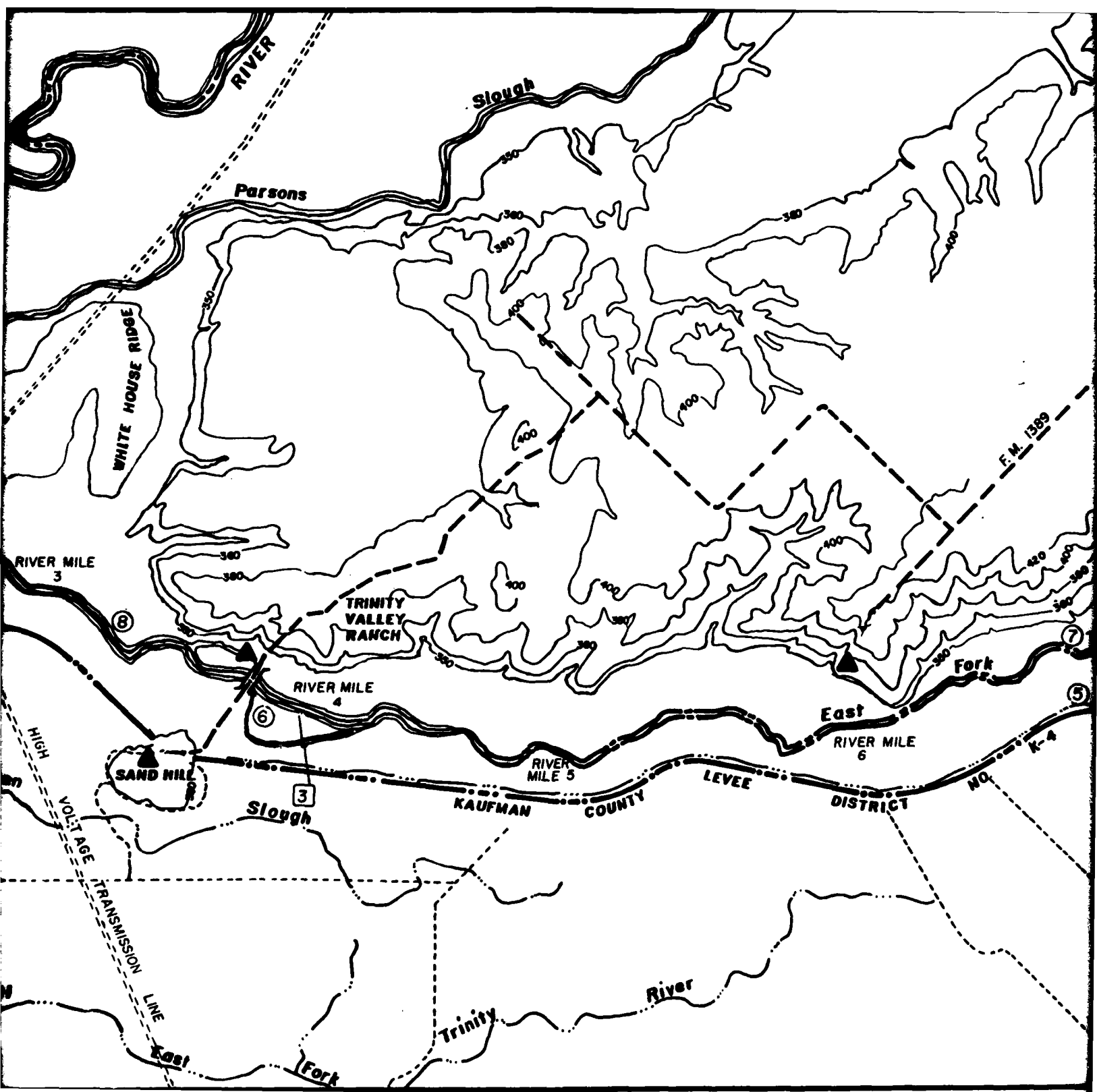
Bacteria: water samples only									
Total Kjeldahl Nitrogen (mg/kg)	TOC (ppm)	Total (cells per 100 ml)	Fecal	Strep	DDT (µg/kg)	Dieldrin (µg/kg)	Endrin (µg/kg)	Hepta- chlor (µg/kg)	Lindane and grease (ppm)
1	930	172	14,100	16,700	0	7.7	0	0	67
2	916	138	...	...	0	4.6	8.3	7	21
3	888	171	46,900	14,600	0	4.7	1.4	0	25
4	785	161	0	6	0	2.9	10.3	0	20
5	785	212	...	...	79.9	0	0	0	32
6	360	125	...	...	0	12.3	0	263	16
7	1075	294	301,000	20,000	21,600	4.8	4.2	0	372
8	<u>1258</u>	<u>276</u>	<u>320,000</u>	<u>34,200</u>	<u>4,180</u>	0	<u>53.0</u>	0	<u>548</u>
Screening levels (ppm)									
1000									
			(water levels)	0.002	0.005	0.002	0.01	0.02	(100?)

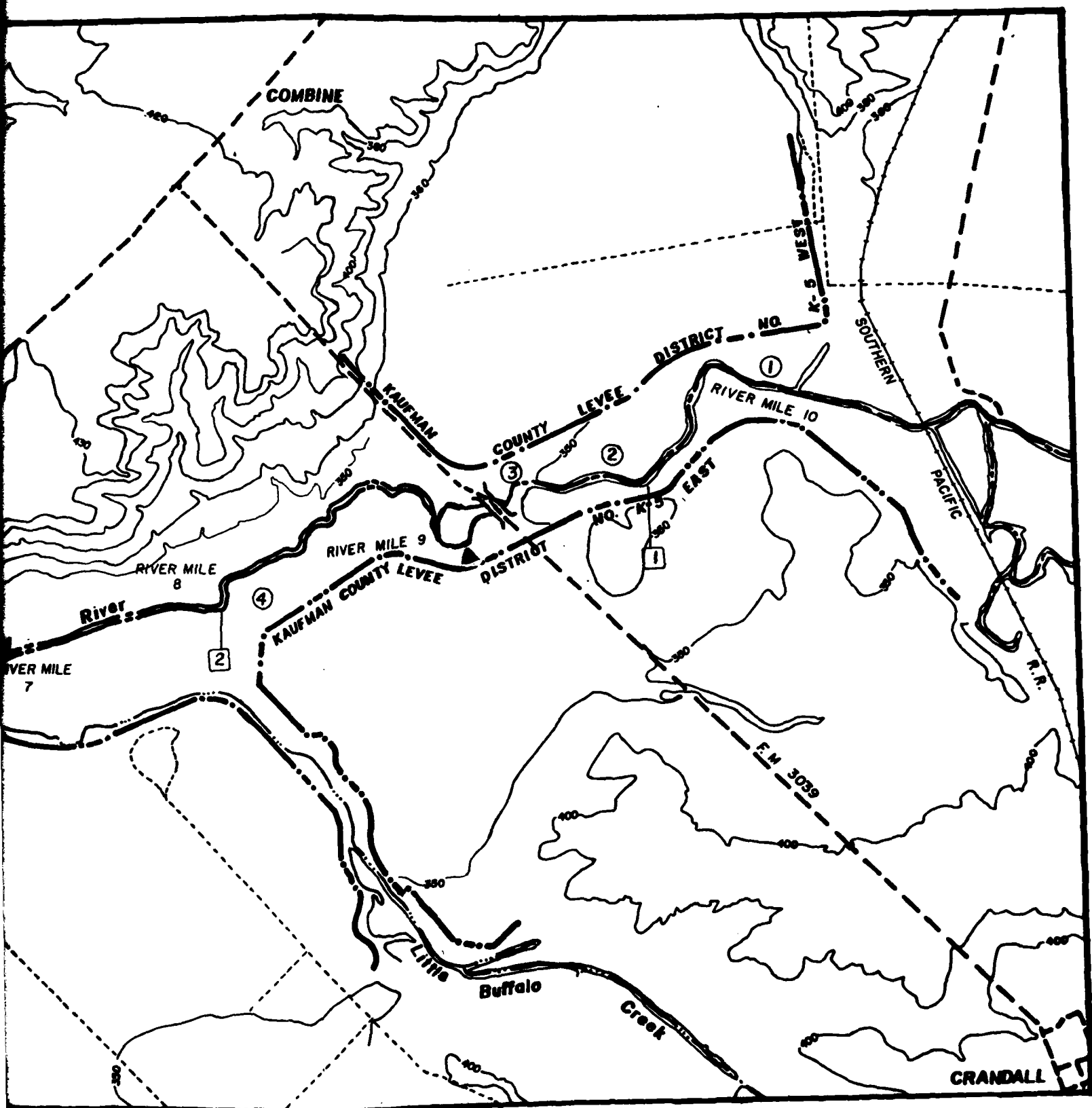
Values underlined are above screening levels or can be considered excessive

Figure 2. Locations of physiological, chemical, biological and ambient noise investigations.









concentrations ranged from 372 to 548 ppm, while soil sample concentrations ranged from 16 to 67 ppm.

Concentrations of pollutants in soils and sediments represent an environmental hazard mainly when they are resuspended or redissolved in overlying water. Therefore, an elutriation test was conducted to simulate the degree to which pollutants in soils or sediments redissolve when agitated with overlying water. The elutriation test involves agitating for 30 minutes a sediment/water mixture and analyzing the filtered extract for increased levels of pollutants. Data in table 2 give results of elutriation tests of soil and sediment samples from station Nos. 1 to 8. The first value represents the concentrate of pollutant in the overlying water (water sample obtained near sampling station), and the second value (subscripts) indicates the concentrate of pollutant in the extract water.

Results of the cadmium elutriation tests indicate that between 0-10% of the cadmium contained in soil and sediment samples may become redissolved, while all chromium data were below detection limits. Copper elutriation test data indicate that less than 4% of the copper contained in sediment is redissolved, while soil test results indicate copper is transferred from the water phase to the soil, due to adsorption of metal ions to soil particles. Lead elutriation data indicate moderate release potential for both soil and sediment bound lead, while data on mercury from soils and sediments indicate negligible release. Elutriation tests for both nickel and zinc indicate that these metals are not released from soil and sediment samples, but conversely, existing metal concentrates in elutriation water are adsorbed. Data for manganese and arsenic are inconsistent, and depending on the individual sample, small amounts of manganese and arsenic are either adsorbed or desorbed from soil and sediment samples.

Climate The project area enjoys a warm, humid, subtropical climate with hot summers. The climate has a continental flavor characterized by a wide range of temperatures with mean maximum temperatures of 95 degrees in July and mean minimum temperatures of 35 degrees in January. During the winter, temperature falls of 20 degrees or more within an hour is not uncommon following the passage of a cold front. Periods of extreme cold that occasionally occur are short lived so that, even in January, mild weather is common. Annual precipitation within the area is approximately 39 inches with high precipitation levels occurring in April and May (monthly average of 4.88 inches). Precipitation levels are typically low in August and September (monthly average of 2.15 inches). Rainfall is moderate

TABLE 2. RESULTS OF ANALYSIS OF WATER SAMPLES FOR THE ELUTRIATION TESTS

Sta- tion	Cd ($\mu\text{g/ml}$)	Cr ($\mu\text{g/ml}$)	Cu ($\mu\text{g/ml}$)	Pb ($\mu\text{g/ml}$)	Hg ($\mu\text{g/l}$)	Ni ($\mu\text{g/ml}$)	Zn ($\mu\text{g/ml}$)	Mn ($\mu\text{g/ml}$)	As ($\mu\text{g/ml}$)
1*	0.039	<0.05	3.42	5.04	<3	9.04	6.10	0.162	0.014
1s**	0.107	<0.05	0.97	8.4	<3	0.766	1.52	0.605	0.021
3	0.043	<0.05	2.21	3.5	<3	6.21	4.96	0.132	0.018
2s	0.107	<0.05	1.16	6.5	<u>105</u>	0.538	1.54	0.145	0.027
3	0.043	<0.05	2.21	3.5	<3	6.21	4.96	0.132	0.018
3s	0.110	<0.05	0.50	5.1	<3	0.732	1.59	0.098	0.015
4	0.041	<0.05	1.81	1.4	4	7.35	1.86	0.165	0.018
4s	0.120	<0.05	0.42	3.5	<3	0.504	1.75	0.112	0.017
7	0.056	<0.05	3.24	0.85	<3	9.20	3.18	0.163	0.023
5s	0.106	<0.05	0.78	10.1	<3	0.586	2.05	0.150	0.014
7	0.056	<0.05	3.24	0.85	<3	9.20	3.18	0.163	0.023
7s	0.047	<0.05	0.13	10.5	<3	0.581	1.99	5.48	0.016
8	0.050	<0.05	0.23	2.45	<3	4.51	1.56	0.230	0.033
6s	0.111	<0.05	0.66	3.4	<3	0.393	1.69	<0.05	0.024
8	0.050	<0.05	0.23	2.45	<3	4.51	1.56	0.230	0.033
8s	0.062	<0.05	0.26	17.2	<3	0.373	1.66	0.299	0.028

* Untreated river water at or near station location

** Concentration after shake test (s) for same station

Values underlined are those which are above EPA screening levels

during the remainder of the year averaging 3.15 inches per month. A large part of the annual precipitation results from thunder-shower activity with occasionally heavy falls over a brief period of time. Snow occurs rarely and is unimportant as a source of moisture.

River Characteristics. The East Fork of the Trinity River has its source in southern Grayson County and flows southerly 110 miles to its confluence with the mainstem of the Trinity River at river mile 460. Its drainage basin encompasses 1,256 square miles. The principal tributaries to the East Fork below Lavon and Forney Dams, are Duck Creek, Big and Little Buffalo Creeks, North and South Mesquite Creeks and Mustang Creek. These streams drain the lower 235 square miles of the total basin. The portion of the East Fork of the Trinity River examined in detail, extends from the Texas and New Orleans Railroad Bridge (approximately 1 mile south of U. S. Highway 175) to the confluence of the East Fork and the Trinity River mainstem. The relationships of the study area to the entire Trinity River Basin and to the East Fork subbasin are shown in figures 3 and 4 respectively. Figure 5 provides a detailed map of the study area showing the locations of reservoirs, tributaries, water quality sampling stations and roads.

The segment of the East Fork under consideration (Increment I) has a meandering course with a length of 10.8 river miles. The average gradient is approximately 2.0 feet per mile. The present channel is not the natural streambed of the lower portion of the East Fork river. Prior to channel and levee construction in the early 1900's, the natural river channel was approximately 1 mile east of the present channel toward the center of the flood plain. The present streambed is nearer the west edge of the flood plain, which averages two miles in width. The abandoned original channel has formed several areas of sloughs which drain agricultural lands protected by the levees.

In April 1977 a field inspection of the study area was made to facilitate a current description of the physical and ecological characteristics of the river and its environs. The present width of the river varies from 20-50 feet, except for a small impounded area south of FM 3039 bridge which varies in width from 100-300 feet and is 1,000 feet in length. Stream depth varies from 2-15 feet with an average depth of six feet. Deepest waters (15 feet) occur in the impoundment near FM 3039. Dense vegetative cover lines the banks of the present channel for 4,000 feet of the river and along oxbows throughout the unchanneled portions of Increment I. Partial channelization

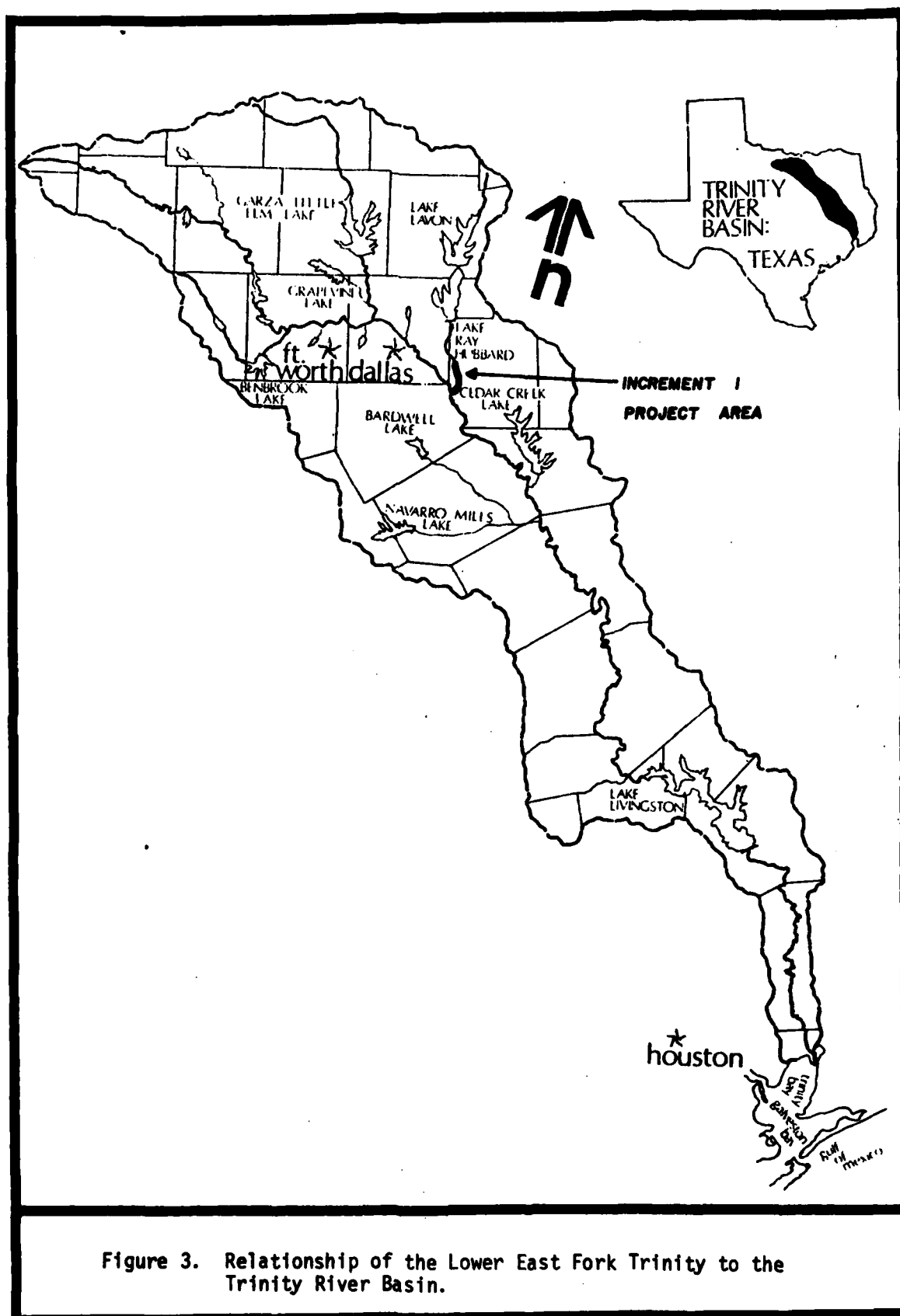


Figure 3. Relationship of the Lower East Fork Trinity to the Trinity River Basin.

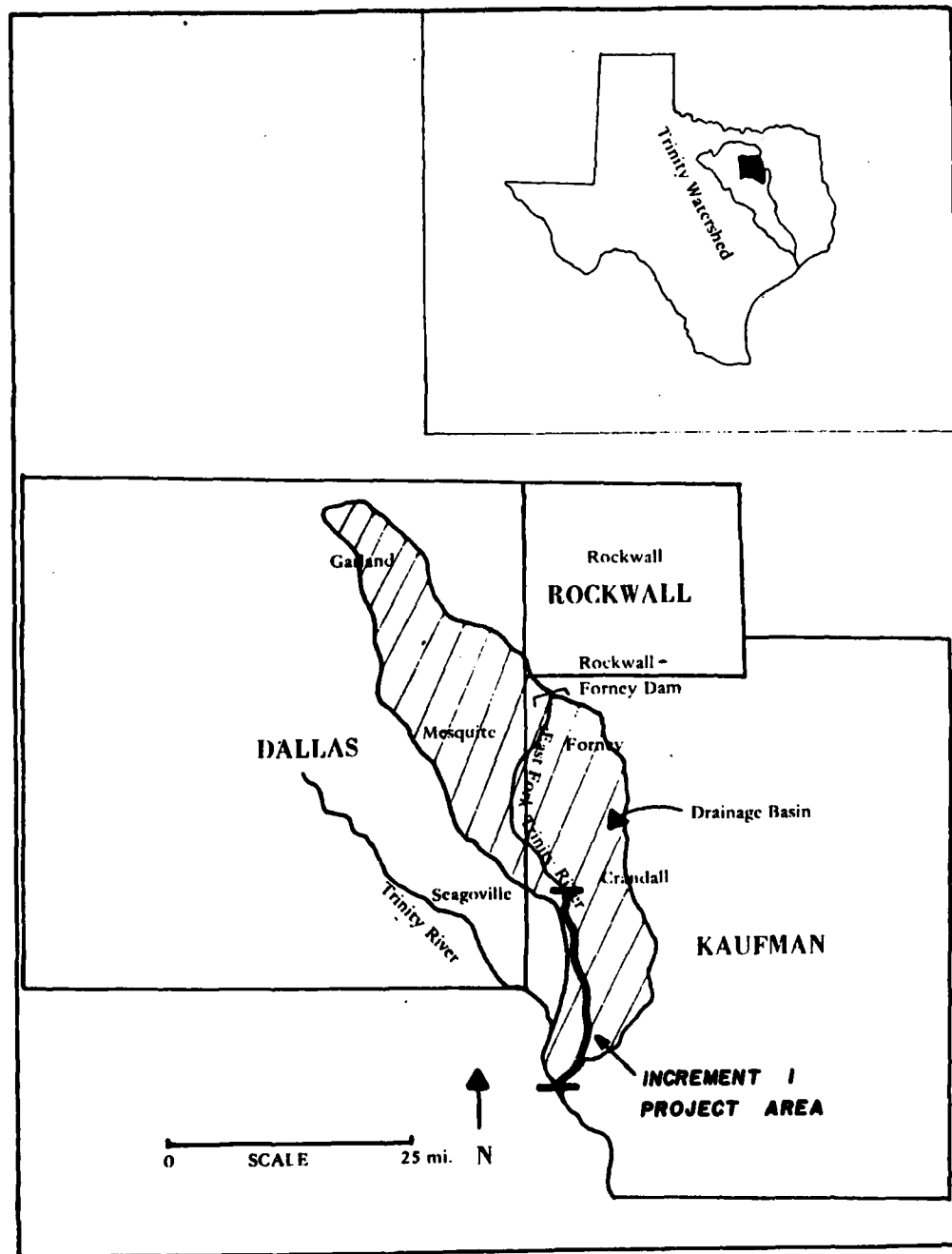
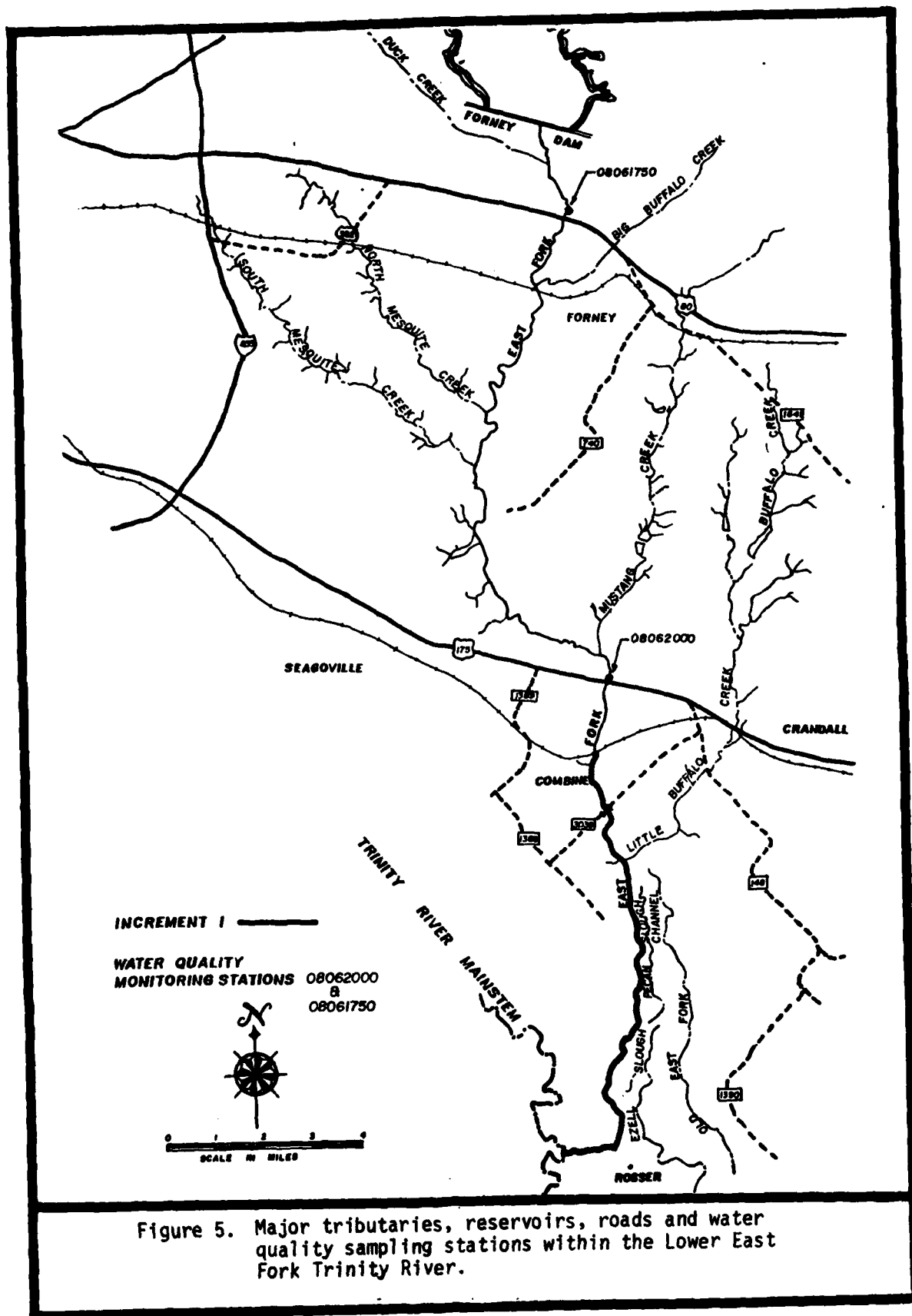


Figure 4. East Fork Trinity River Subbasin



and straightening has been completed on the first five miles from the mouth, and channel right-of-way has been cleared for all but a limited area near river mile 7. Numerous logjams exist in the present channel between river mile 1 and the Trinity Valley private bridge. Manmade structures intersecting the river channel include two bridges (FM 3039 bridge with moderate local traffic and the Trinity Valley Ranch private bridge with agricultural vehicle traffic) and one high voltage power transmission line.

Dissolved oxygen readings varied from 1.0 (1 mile downstream from FM 3039 bridge) to 5.2 (Station near Sand Hill) with an average of 2.5 mg/l. Water temperature readings ranged from 21° to 23° C, while stream current was estimated to be between 1 and 2 feet/sec. Sediment profiling with a depth recorder and probe testing revealed very little sediment or silt in the upper portions of the East Fork study area. In the lower portions, where partial channelization has been completed, some sedimentation was evident. Stream depth was fairly shallow (2 feet), and stream velocity was low in the partially channelized area near Sand Hill. Also, bank erosion and sand bars were evident in the channel near Sand Hill.

Flow conditions in the East Fork vary widely depending on several contributing factors which are; release from Lake Ray Hubbard, return flow from Garland and Mesquite sewage treatment plants, and quantity and intensity of precipitation. The relationship between the above influencing factors is not totally predictable, but several conclusions can be made from existing data (table 3, figure 6). During periods of low flow (less than 50 cfs), the primary source of water is return flow from sewage treatment and to a lesser degree, runoff from the watershed. Conversely, during periods of higher flow (greater than 100 cfs), the primary source of water is from Lake Ray Hubbard, and usually to a lesser degree, runoff from the watershed below Forney Dam. Return flow from sewage treatment plants has increased linearly from 25 cfs to 39 cfs (56%) during the 3 year period of 1971-1974. Release from Lake Ray Hubbard follows a somewhat cyclical pattern with periods (4-8 months) of either no release or substantial outflow (200-400 cfs) from the reservoir.

Due to the influences of the three widely differing types of inputs to the composite flow of the East Fork, a description of flow patterns can be summarized as cyclical. From the continuous flow data charts (figure 7, 1970-1975), some trends in the flow cycle are apparent. Low flows are persistent in late summer (between June and September), while high flows tend to occur periodically throughout the remainder of the year.

TABLE 3. EAST FORK OF TRINITY FLOW DATA AND INPUT QUANTITIES

WY	MO.	STREAM FLOW (S) cfs	RETURN FLOW (RF) cfs	RELEASE (R) cfs	S-(RF+R)	Precipitation in
Closure of spillway gates at Rockwall-Forney Dam						
71	4	942.		925.		3.04
	5	131.		8.06		4.44
	6	240	22.0	5.00	213.	1.71
	7	28.2	22.1	8.74	- 2.64	0.36
	8	40.7	24.6	7.55	8.55	0.58
	9	112.	25.9	8.27	77.8	11.42
	10	196.	26.9	7.48	162.	8.74
	11	48.4	24.5	6.87	17.0	0.72
	12	249.	24.5	229.	- 4.50	1.33
	1	42.5	26.6	4.23	11.7	0.34
	2	79.5	29.9	6.00	43.6	2.68
	3	44.3	27.1	5.90	11.3	0.59
72	4	43.4	26.0	4.83	12.6	3.90
	5	43.5	25.5	4.23	13.8	2.59
	6	26.6	29.4	5.00	- 7.8	1.63
	7	41.1	28.8	4.23	8.07	4.66
	8	57.3	33.0	4.23	20.1	3.64
	9	56.4	32.0	5.00	19.4	1.87
	10	829.	35.6	4.23	789.	9.61
	11	749.	32.0	789.	- 72.0	0.97
	12	4401.	37.9	3750.	613.	5.87
	1	3083.	35.1	2902.	146.	2.63
	2	144.	31.2	124.	- 11.2	0.38
	3	71.1	31.6	38.2	1.3	0.17
73	4	58.9	33.3	19.8	5.8	2.95
	5	43.9	35.6	0.0	8.30	1.24
	6	45.1	35.3	1.23	8.57	2.68
	7	29.9	33.3	4.23	- 7.63	0.29
	8	26.8	34.8	4.23	- 12.2	0.34
	9	25.9	34.7	5.00	- 13.8	2.21
	10	64.7	35.0	4.23	25.5	6.27
	11	85.0	37.5	2.77	44.7	3.64
	12	55.9	35.1	0.0	20.8	1.39
	1	141.	39.3	0.0	102.	4.06
	2	368.	38.2	229.	101.	2.73
	3	2769.	39.9	1619.	1110.	3.08
	4	1467.	39.6	938.	489.	5.58
	5	2096.	39.5	208.	1848.	1.21
	6	2499	36.5	1772.	690.	11.19
	7	651.	39.3	404.	208.	4.32
	8	50.5	37.8	4.23	8.47	.93
	9	721.		655.		

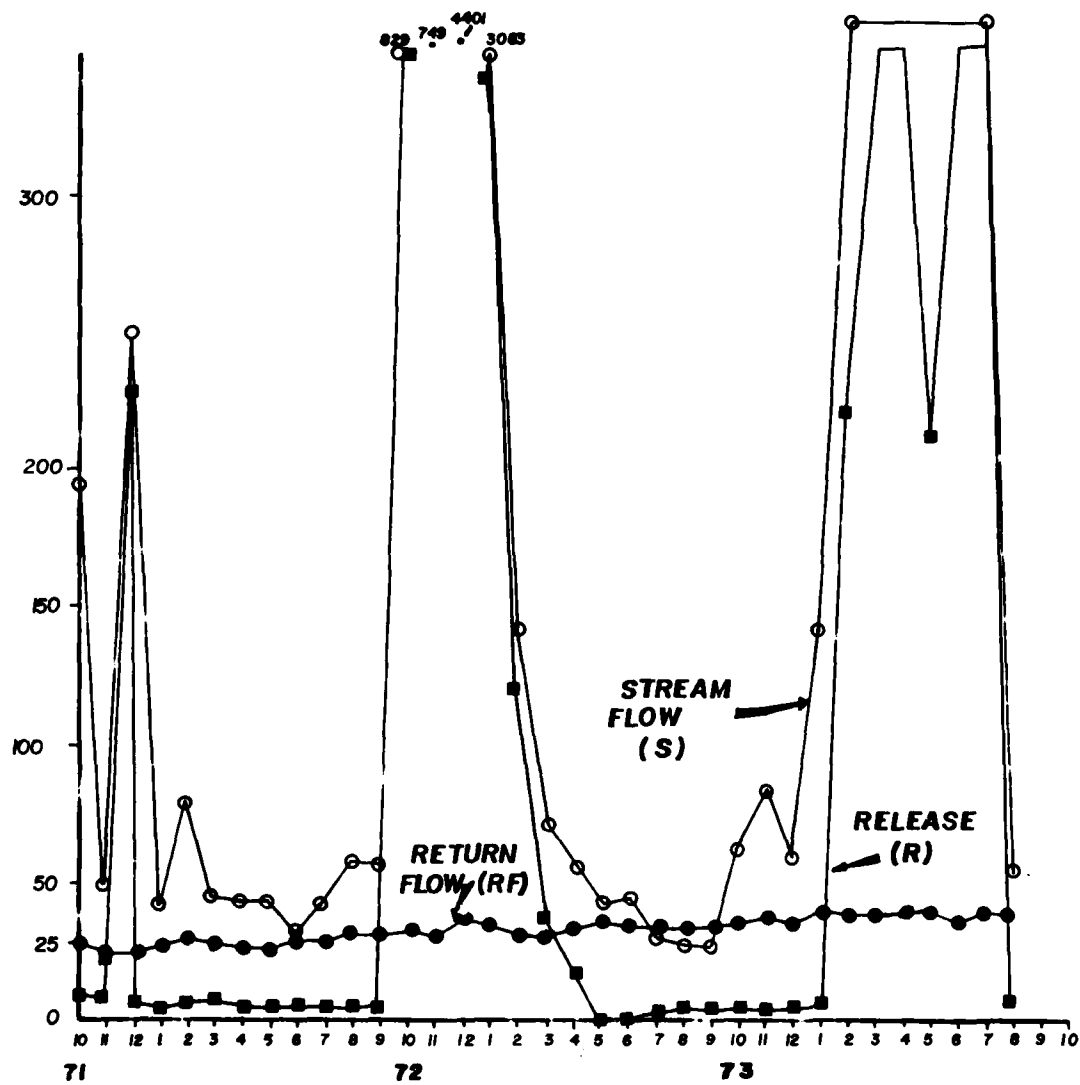


Figure 6. Relationship between river flow and input from wastewater treatment plants and release from Forney Dam.

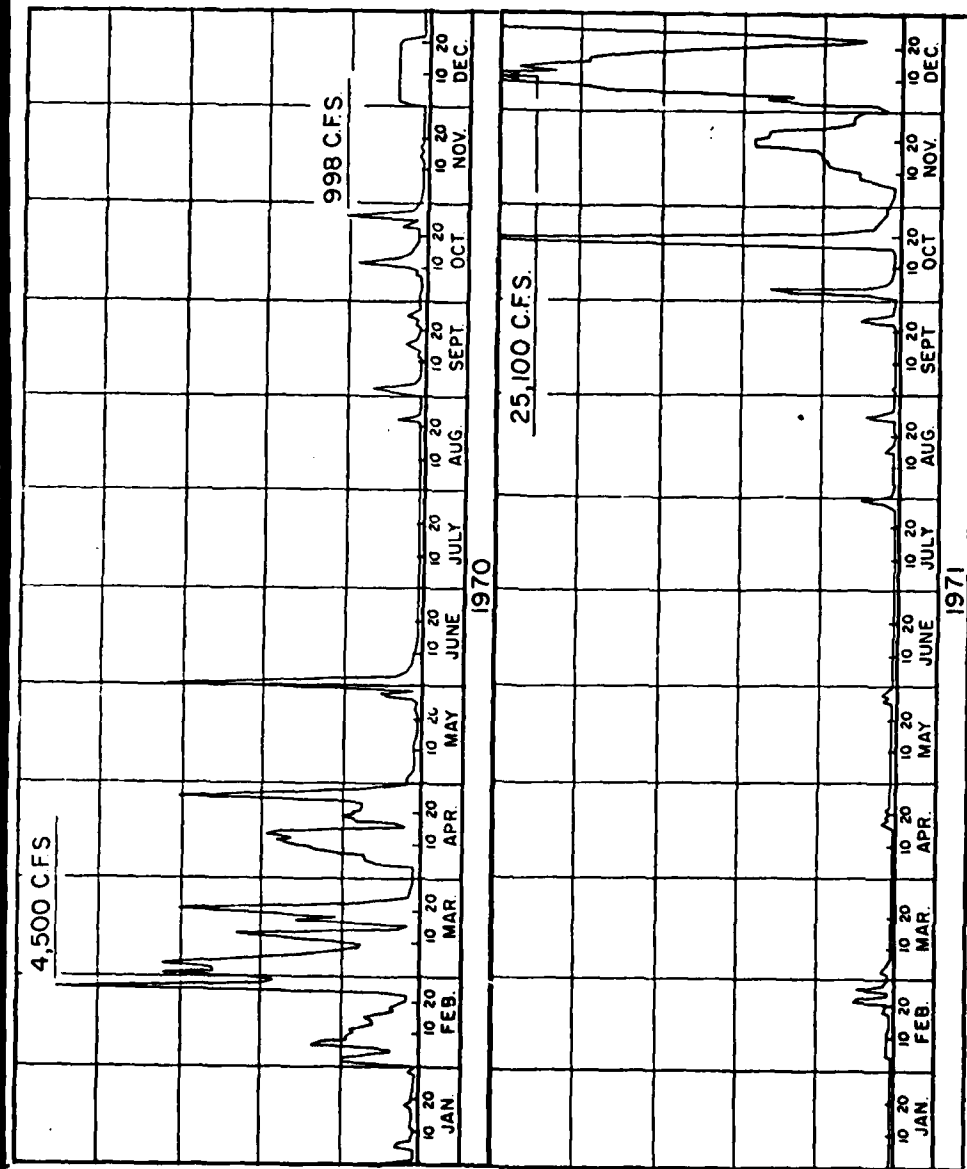


Figure 7. Continuous Flow Data Charts

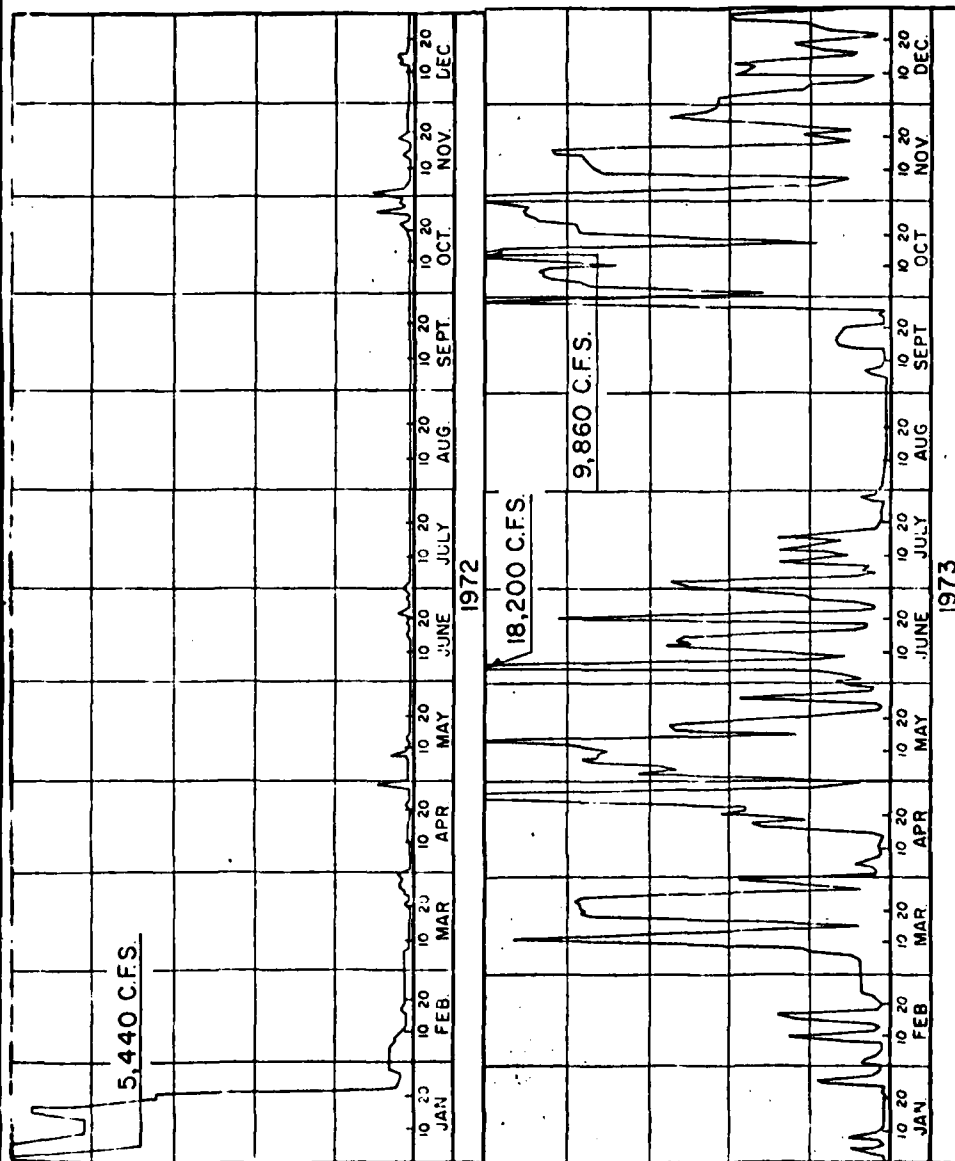


Figure 7. (Continued)

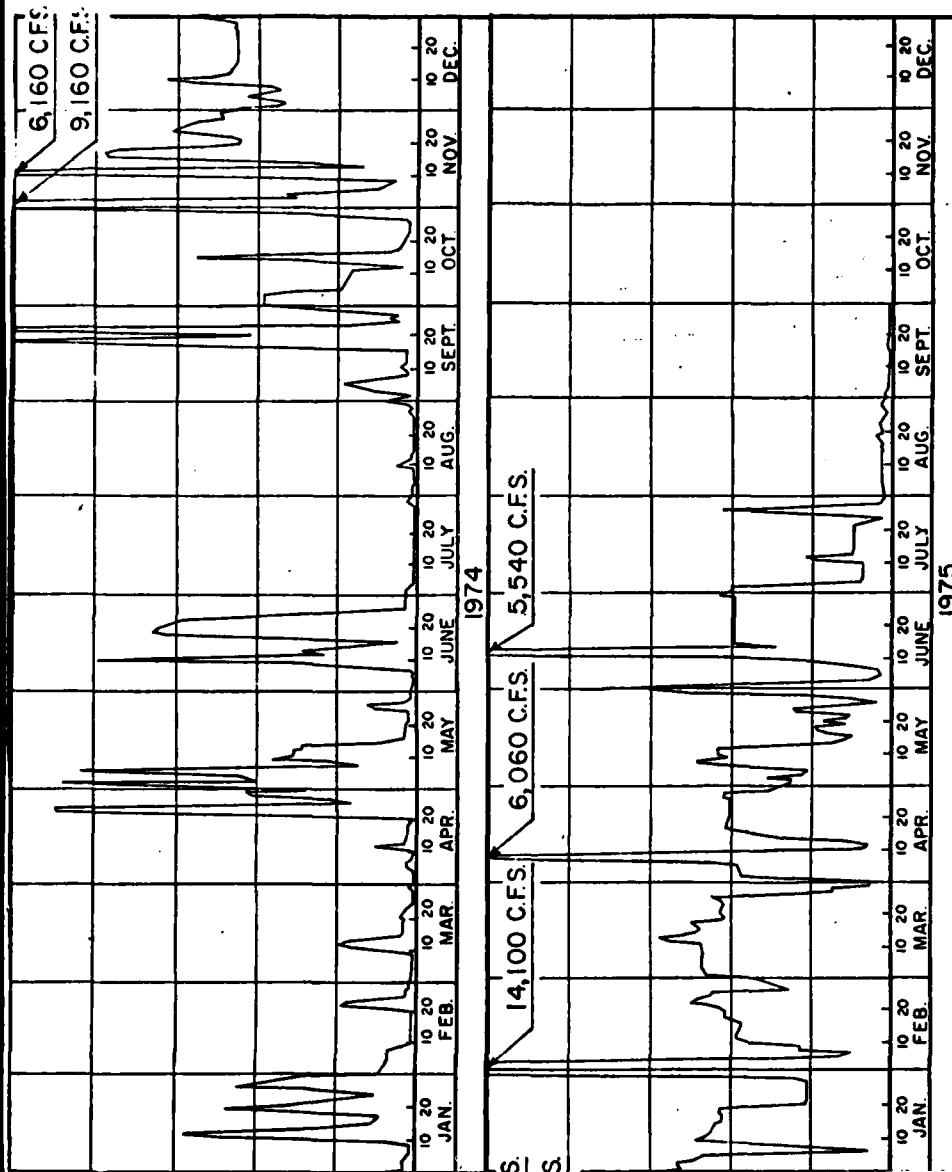


Figure 7. (Continued)

Point and Nonpoint Discharges Six wastewater treatment facilities are located along tributaries entering the East Fork of the Trinity River below Forney Dam. These facilities service communities ranging in size from 600 to 67,000 residents and have a combined discharge rate of approximately 25 mgd (million gallons per day), (table 4). Treatment facilities include three systems using trickling filters, one using contact stabilization, one oxidation pond and one Imhoff Tank.

The City of Garland Duck Creek Plant is the largest of the plants with a daily discharge rate of 18.8 mgd (million gallons per day). This facility is located on Duck Creek, a tributary entering the East Fork immediately south of Forney Dam. Rockwall Estates, Inc. operates a small unit located on Buffalo Creek entering the East Fork near Forney. The plant has a discharge rate of 0.022 mgd and is a contact stabilization system. The City of Mesquite operates a trickling filter unit with a discharge rate of 5.75 mgd. Wastewater effluent enters the East Fork River flood plain. The City of Seagoville operates a trickling filter plant with a discharge rate of 0.31 mgd which enters an unnamed creek northeast of the city. Mustang Creek, entering the East Fork immediately north of Crandall, carries the effluent of the City of Forney. The system operates on an oxidation pond principle and has a discharge rate of 0.60 mgd. Wastewater effluent from the City of Crandall is discharged into Little Buffalo Creek at a rate of 0.067 mgd. The system operates on an Imhoff Tank principle.

In total, the municipal wastewater treatment facilities discharging into the tributaries of the East Fork serve 115,200 people, the majority of which are in the cities of Garland and Mesquite. Figure 8 shows point source discharges within the lower East Fork of the Trinity.

Nonpoint discharges into the East Fork of the Trinity River include urban, residential and agricultural runoff. It is difficult to quantify the amount of pollutants entering the river from such sources since the amounts are contingent upon meteorological conditions prior to and at the time of the discharges as well as the characteristics of the watershed itself. However, due to the presence of Lake Ray Hubbard at the upper end of the study area which serves to retain pollutants gathered from most of the 1,256 square mile drainage basin, the contribution of nonpoint discharges to water quality in the lower East Fork is believed to be minimal.

TABLE 4. MUNICIPAL POINT SOURCE EFFLUENT ENTERING THE LOWER PORTION OF THE EAST FORK OF THE TRINITY RIVER (WATER YEAR 1973)

DISCHARGER Population Served	TREATMENT	DISCHARGE RATE MGD	OXYGEN DEMAND LOADING		DISCHARGE POINT(S)
			PPD	% OF TOTAL	
City of Garland Duck Creek Plant 67,200	Trickling Filter	18.8	12,855	92	Duck Creek to East Fork
Rockwall Estates, Inc. 3,200	Contact Stabilization	0.022	0.78	< 1	Buffalo Creek to East Fork
City of Mesquite 48,000	Trickling Filter	5.75	958	7	South Mesquite Creek to East Fork
City of Seago- ville 3,500	Trickling Filter	0.31	76	< 1	Unnamed creek to East Fork
City of Forney 1,500	Oxidation Pond	0.60	25	< 1	Mustang Creek to East Fork
City of Crandall 600	Imhoff Tank	0.067	20	< 1	Little Buffalo Creek
		25.549	13,935	100	

Source: Texas Water Quality Board, 1975.

Within the 235 square mile drainage area below Forney Dam, nonpoint discharges entering the river are derived largely from agricultural land. Pollutants from these areas are largely comprised of agricultural chemicals and animal wastes. The small size of this watershed, the limited extent of crop production in this area, and the low percentages of applied chemicals provide further evidence that the quantities of nonpoint pollutants are small.

Water Quality Most water quality and flow data available for the East Fork were collected at the Texas Department of Water Resources (TDWR) and USGS stations located near the Highway 175 bridge. This sampling location is approximately 2 river miles north of the proposed Increment I channelization termination point (see figure 5). The water quality and flow data obtained from the above sampling station should adequately represent conditions downstream to the point of confluence with the mainstem since the only inputs below the sampling station are Buffalo Creek and agricultural runoff of adjacent lands. Input from the Crandall sewage treatment plant located upstream on Buffalo Creek is very low (.1 cfs) and is insignificant in terms of the total pollutant loading of the lower East Fork. Stream flow below Highway 175 to the confluence of the mainstem is expected to be essentially equivalent to flow measured at the USGS station near Highway 175.

Water quality standards for the East Fork of the Trinity River were established by the Texas Water Quality Board (now TDWR) and approved by the Environmental Protection Agency in 1973. Parameters for which limits are set include temperature, pH, dissolved oxygen, fecal coliforms, dissolved chlorides, dissolved sulfates and total dissolved solids. Also considered in this discussion are BOD₅, total phosphate, ammonia nitrogen and nitrate nitrogen. Data for water quality parameters mentioned above are contained in table 5. Table 6 contains combined data from TDWR station 0819.01 and USGS station 08062000 due to their close proximity. Table 6 contains a summary of recent data (1974-1976) from several stations on the East Fork and reflects the overall water quality of the East Fork.

Temperature and pH Standards for maximum water temperature in the East Fork have been established and are 91°F (32.8°C). This standard applies, provided the daily flow at the USGS sampling station equals or exceeds the minimal expected seven day average flow established during a two year period. Temperatures during Water Years 1973-1976 range from 4-32°C, with the maximum usually recorded in August. None of the data contained in table 6 exceeded this standard. The mean water temperature for recent Water Years

TABLE 5. WATER QUALITY DATA AND CRITERIA

EAST FORK TRINITY RIVER BETWEEN RAY HUBBARD DAM AND CONFLUENCE WITH THE MAINSTEM
TRINITY RIVER - Segment 0819

Water Analyses - East Fork (DAL 17; NT 1, 2, 3, 4, 5; TRA; TWQB 0819.01;
USGS 08062000). All concentrations are in mg/l, unless otherwise specified.

PARAMETER	MEAN	MAX	MIN	S	N
Temperature (C)	20.5	31.0	4.0	4.2	80
Dissolved Oxygen	2.1	13.0	0.0	**	82
pH (pH units)	7.4	8.3	6.8	0.2	80
Conductivity (umhos/cm)	456	693	190	88	81
Total Suspended Solids	87	555	3	**	46
Volatile Suspended Solids	39	202	1	**	44
Total Dissolved Solids	270	463	124	78	36
Ammonia, as N	7.2	22.6	0.10	**	69
Nitrite, as N	0.02	0.10	0.00	**	54
Nitrate, as N	0.12	0.58	0.00	**	55
Organic Nitrogen, as N	2.6	12	0.39	**	37
Total Phosphate, as P	4.9	11	0.23	**	37
Orthophosphate, as P	6.1	64.2	0.06	**	76
Chloride, as Cl	30	57	1.9	**	79
Sulfate, as SO ₄	34	59	9.8	12	60
Total Alkalinity, as CaCO ₃	163	264	86	42	51
Carbonate, as CO ₃	0	0	0	0	21
Total Hardness, as CaCO ₃	128	164	90	18	51
Noncarbonate Hardness, as CaCO ₃	3	14	0	**	21
Chlorophyll a (ug/l)	23	49	5	**	6
Fecal Coliform (#/100 ml)	47000*	9.4x10 ⁶	0	**	26
Total Coliform (#/100 ml)	7x10 ⁶	4.4x10 ⁷	1150	**	21
Color (Pt-Co units)	31	90	0	**	21
Turbidity (JTU)	31	100	6	**	40
Biochemical Oxygen Demand ₅	24	56	2	**	56
Total Organic Carbon	21	44	4.3	**	40
Phenols (ug/l)	14.4	90	0	**	20
Methylene-Blue-Active Sub.	0.7	2.2	0.0	**	21
Silica, as SiO ₂	7.0	13	0.9	3.5	21
Calcium, as Ca	46	56	36	6.9	21
Magnesium, as Mg	2.9	5.0	1.6	0.8	21
Sodium, as Na	33	72	12	**	21
Potassium, as K	6.4	12	3.2	3.	21

Table 5. (Continued)

PARAMETER	MEAN	MAX	MIN	S	N
Sodium Absorption Ration, SAR	1.3	3.0	0.4	**	21
Fluoride, as F	1.1	2.9	0.3	**	18
Aluminum, as Al ($\mu\text{g/l}$)	77	120	20	-	3
Arsenic, as As ($\mu\text{g/l}$)	3	3	2	-	3
Boron, as B ($\mu\text{g/l}$)	320	340	290	-	3
Cadmium, as Cd ($\mu\text{g/l}$)	2	3	0	-	3
Chromium, as Cr ($\mu\text{g/l}$)	6	10	0	-	3
Cobalt, as Co ($\mu\text{g/l}$)	0	0	0	-	3
Copper, as Cu ($\mu\text{g/l}$)	21	41	4	-	3
Iron, as Fe ($\mu\text{g/l}$)	170	230	120	-	3
Lead, as Pb ($\mu\text{g/l}$)	6	14	0	-	3
Lithium, as Li ($\mu\text{g/l}$)	7	10	1	-	3
Manganese, as Mn ($\mu\text{g/l}$)	107	190	60	-	3
Mercury, as Hg ($\mu\text{g/l}$)	0.3	0.6	0.0	-	3
Nickel, as Ni ($\mu\text{g/l}$)	19	28	7	-	3
Strontium, as Sr ($\mu\text{g/l}$)	620	750	550	-	3
Zinc, as Zn ($\mu\text{g/l}$)	23	50	9	-	3

- Standard deviation not computed when N is less than six.

* Log. mean to conform to standards.

** Data from a clearly non-normal distribution; no standard deviation computed.

Water Quality Standards - These standards for water quality in the East Fork Trinity River were taken from TWQB 1976.

Temperature - Not to exceed 32.8° C. Criterion met.

Dissolved Oxygen - Criterion not met. Segment 0&19 is considered an "inland effluent-dominated stream" by the TWQB (1976). The dissolved oxygen criterion for such a stream is 2.0 mg/l (minimum). The mean value of 2.1 mg/l, as recorded in the WATER ANALYSES table, indicates that much of the time dissolved oxygen concentrations were below the 2.0 mg/l standard. As a matter of fact, several values of 0.0 mg/l were reported.

pH - Acceptable range: 6.5-8.5. Criterion met.

Total Dissolved Solids - Mean concentration not to exceed 400 mg/l. Criterion met (no reported values exceeded 400 mg/l).

Chloride - Mean concentration not to exceed 75 mg/l. Criterion met (no reported values exceeded 75 mg/l).

Sulfate - Mean concentration not to exceed 50 mg/l. Criterion met (a high value of 59 mg/l was reported).

Fecal Coliform - Log. mean not to exceed 2000 organisms/100 ml. Criterion not met. Available recent data produce a log. mean fecal coliform concentration of 47,000 organisms/100 ml. This is nowhere close to the standard of 2000 organisms/100 ml. Poorly treated municipal sewage entering the East Fork, primarily from Duck Creek, has resulted in fecal coliform problems for a long time.

Table 5. (Continued)

As stated in TWQB (1976), fecal coliform data must be "from a representative sampling of not less than 5 samples collected over not more than 30 days." The NTMWD collected and analyzed a large number of samples from the lower East Fork over a two-week period. The log. mean fecal coliform count from this sampling was in excess of 400,000 organisms/100 ml.

TABLE 6. TEXAS WATER QUALITY BOARD USGS WATER QUALITY DATA
EAST FORK OF TRINITY RIVER 1973-1976

Date of Sample	Stream flow cfs	Temp. °C	pH Units	DO mg/l	BOD ₅ mg/l	TDS mg/l	Cl mg/l	SO ₄ mg/l	NH ₃ -N mg/l	NO ₃ -N mg/l	T-PO ₄ mg/l
09/13/73		26.6	7.3	1.3	42.0	246	31	48	8.0	.10	-
09/17/73	660	26.1	8.0	4.5	-	160	10	27	.3	.04	2.6
09/23/73		25.0	7.7	-	-	235	31	41	-	-	-
10/11/73	2460	22.0	7.8	-	-	187	31	41	-	-	-
10/17/73	836	20.0	8.1	6.0	-	170	-	-	-	-	-
10/29/73	4460	17.0	6.9	7.5	1.5	146	7	24	.3	.10	.46
11/12/73	3700	17.5	7.3	-	-	151	-	22	-	-	-
11/14/73	3650	18.0	6.7	7.5	1.8	148	-	24	.03	.10	.21
12/10/73	-	11.5	7.0	12.4	1.4	150	-	25	.16	-	.34
12/13/73	-	12.8	7.8	6.0	-	150	6	45	.10	.16	.43
12/27/73	1530	8.5	7.5	-	-	150	-	23	-	-	-
01/29/74	2020	8.0	7.2	12.4	10	162	-	24	.19	.00	.55
01/31/74	468	10.4	7.7	-	-	185	14	31	-	-	-
02/07/74	382	8.0	-	-	-	184	13	35	-	-	-
02/12/74	71	13.0	7.0	1.8	12.0	342	46	67	5.6	.02	15.6
03/12/74	924	18.0	7.5	7.4	6.6	171	10	33	.11	.18	1.10
03/20/74	253	17.0	8.0	5.0	-	212	17	37	2.3	.15	5.70
04/18/74	133	21.0	7.3	2.7	7.1	287	22	44	4.0	.05	10.4
05/7/74	2020	23.0	7.2	6.4	3.5	171	9	28	.21	.20	1.04
06/5/74	89	89.0	7.5	2.5	-	360	42	56	7.8	.05	25.0
06/18/74	2990	26.5	7.3	6.8	2.4	155	9	25	.11	.14	.73
07/8/74	40	26.7	7.7	3.0	-	420	-	-	-	-	-
07/17/74	50	32.0	7.5	5.4	25.0	282	38	49	9.60	.07	-
08/6/74	(low)	26.0	7.4	1.8	-	290	-	-	-	-	-
08/7/74	76	27.5	7.3	3.0	20.0	274	35	55	11.0	.00	-
09/23/74 (moderate)		20.0	7.7	8.0	-	75	8	24	.10	.14	.72
09/27/74	231	21.0	7.0	3.8	5.6	224	18	42	1.10	.21	.00
10/19/74	-	20.0	7.1	3.0	5.8	182	17	31	1.30	.22	.00
11/6/74	-	18.0	7.3	5.8	5.5	172	12	25	.45	.15	.00

Table 6. (Continued)

Date of Sample	Stream-flow cfs	Temp. °C	pH Units	DO mg/l	BOD ₅ mg/l	TDS mg/l	Cl mg/l	SO ₄ mg/l	NH ₃ -N mg/l	NO ₃ -N mg/l	T-PO ₄ mg/l
12/5/74	-	12.0	7.9	11.6	-	225	12	26	.10	.16	.00
12/5/74	-	10.5	7.4	8.8	2.4	157	10	28	.13	.16	.00
01/10/75	-	10.0	7.3	8.6	3.0	164	9	26	.31	.10	.00
02/27/75	-	12.5	8.3	13.0	2.8	165	9	26	.12	.12	.00
03/4/75	-	9.5	7.3	11.0	-	175	11	31	1.00	.20	1.53
03/27/75	-	15.5	7.7	8.8	4.4	185	12	30	.34	.27	.00
04/22/75	-	16.5	7.3	8.0	2.6	177	8	27	.33	.31	.00
05/13/75	-	24.4	7.5	7.0	-	175	13	32	.07	.24	2.14
05/15/75	-	21.0	6.9	4.2	10.0	184	15	30	.66	.58	.00
06/20/75	1750	26.0	7.3	6.6	2.8	168	9	26	.10	.23	.00
07/23/75	193	30.0	7.0	2.4	4.1	176	14	31	1.30	.07	.00
08/6/75	135	29.5	7.6	6.1	8.2	187	18	32	2.70	.03	.00
08/7/75	109	30.0	7.1	1.0	-	225	25	28	2.40	.00	12.24
09/24/75	52	22.0	7.0	1.0	20.0	257	36	41	11.0	.00	.00
10/22/75	-	20.0	6.9	.0	26.0	314	44	41	14.0	.01	.00
11/10/75	10	-	7.0	.7	-	250	63	40	13.8	.01	67.3
11/12/75	-	17.0	6.9	.0	27.0	336	54	32	14.0	.01	.00
12/3/75	-	11.0	7.0	1.4	19.0	346	57	58	13.0	.14	.00
01/8/76	-	4.0	6.9	.8	43.0	306	39	50	17.0	.15	.00
02/6/76	-	13.5	7.1	.5	-	275	67	45	16.2	.31	4.63
02/10/76	-	14.0	6.9	.0	56.0	307	42	44	12.0	.00	.00
03/2/76	-	19.5	7.3	.0	54.0	341	53	28	17.0	.00	.00
04/28/76	-	20.0	6.9	-	-	168	14	27	2.3	.10	.00
05/7/76	-	19.0	7.6	6.0	-	115	8	18	.64	.30	.00
06/2/76	-	27.0	7.4	3.6	-	187	-	-	-	-	-
07/26/76	-	30.0	7.5	.5	-	-	-	-	-	-	-
08/9/76	-	31.0	7.4	.0	-	380	64	14	14.8	.02	.00
09/9/76	-	27.0	7.3	2.0	-	300	-	-	-	-	-
11/30/76	-	9.0	7.4	.7	-	337	51	36	17.0	.05	28.3
Data Summary (WY 1974-1976)											
No. of Samples	57	57	57	51	31	57	47	52	46	45	43.0
Mean	19.3	7.35	7.35	4.67	14.1	221	24.9	33.5	4.9	.13	4.23
Standard deviation	7.1	.35	.35	3.70	15.8	76	18.3	11.5	6.1	.12	11.70

1973-1976 was 19.3°C with a standard deviation of 7.1°C. pH values are limited to a range of 6.5 to 8.5 by the standards regardless of flow. All pH values recorded for Water Years 1969-1976 fall within this range. The mean pH for the most recent 3 years of data was 7.35 with a standard deviation of .35.

Dissolved Oxygen A minimum dissolved oxygen concentration of 5.0 mg/l is specified in the standards whenever flow exceeds the seven-day average low flow to be expected at a recurrence interval of 2 years. A minimum dissolved oxygen concentration of 2.0 mg/l is specified whenever stream flow primarily consists of sewage effluent. The seven day average low flow expected once every 2 years was projected to be 22.3 cfs (Texas Department of Water Resources). Of the available flow data in table 6, only one flow measurement fell below 22.3 cfs (November 10, 1975 at 10 cfs). Of the 10 years of dissolved oxygen data contained in table 6 46 values (28%) fell below 2.0 mg/l and 80 values (49%) fell below 5.0 mg/l. The mean dissolved oxygen concentration for all data in table 6 was 4.66 mg/l with a standard deviation of 3.31 mg/l. From the above historical data, it can be estimated that the dissolved oxygen levels for the East Fork fall below standards between 30-50% of the time.

In order to evaluate the effects of the proposed Garland-Duck Creek, Mesquite, and Seagoville sewage treatment plants and to aid in Section 208 planning efforts, the North Central Texas Council of Governments, acting through TDWR, formulated a steady-state model of the East Fork from Forney Dam to the confluence with the Trinity River. This model includes the effects of advection, dispersion, individual constituent changes, and sources and sinks, and is capable of simulating carbonaceous biochemical oxygen demand (BOD), dissolved oxygen (DO), benthic oxygen demand, nutrient cycles, algae production, coliforms, and conservative substances. Model verification is based on fall 1975 data with sensitivity analysis to stream geometry conducted in 1976 causing the inclusion of more extensive geometric or cross sectional data.

Using this expanded and refined model, several runs were made in July and August 1978. A run including future treatment levels (10 mg/l BOD₅, 15 mg/l TSS and 10 mg/l NH₃-N) and existing flows and geometry was conducted for calibration and verification. A second run which represents projected conditions without the East Fork Increment I project and which includes future treatment levels, anticipated effluent low flows, and existing geometry (table 7) indicates DO levels slightly below the stream standard for a short interval. A run including future treatment levels anticipated effluent flows or low flows, and proposed Increment I channel modifications were also made. This final run assumed 100 percent oxygen saturation at the

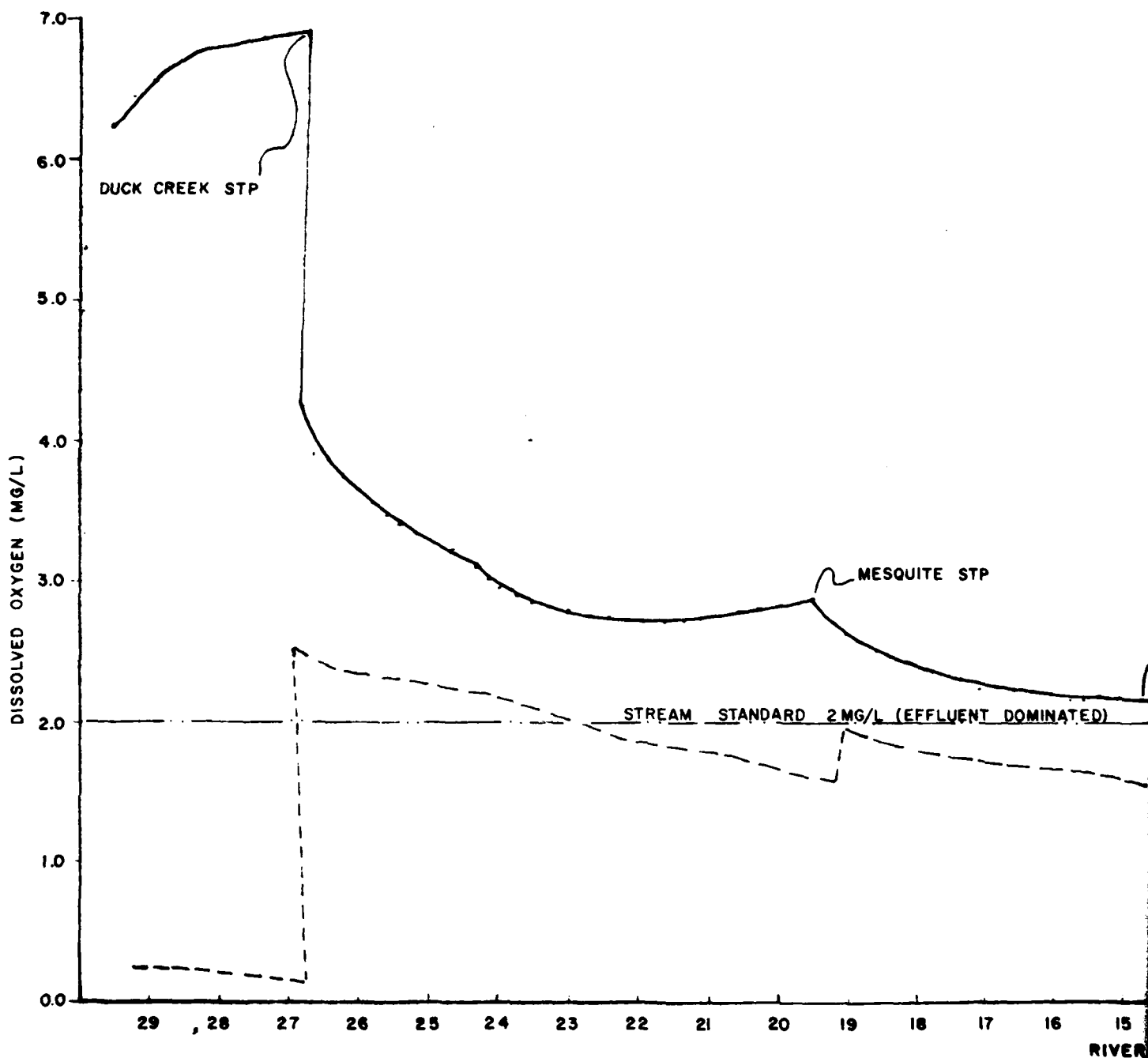
drop structure which transitions the natural channel into Increment I. This drop structure is 80 feet wide with a 12-foot drop over a distance of 150 feet which is lined with 9 to 24-inch riprap. Projections of dissolved oxygen with the proposed channel modifications indicate that DO levels will increase substantially across the drop structure, decline sharply, and then begin increasing again near the confluence with the Trinity River. The model projection of DO remains above the effluent dominated stream standard through the entire increment (table 8).

The degree of confidence that can be placed in these projections, as in any modeling effort, is based upon two factors: (1) the ability of the model to realistically reproduce an existing range of water quality conditions and (2) the degree to which extrapolations are made from present to projected conditions. The degree of confidence is directly related to item 1 and inversely related to item 2.

Total Dissolved Solids, Chlorides and Sulfates The maximum yearly average concentrations permitted by the standards for TDS, chlorides and sulfates are 400 mg/l. These standards apply for any year in which the mean flow is equal to or greater than 50% of the median flow for the period of record for existing hydrological conditions. All TDS, chloride and sulfate data contained in table 6 meet the requirements outlined above. Total dissolved solids data, for Water Years 1973-1976 range from 75 mg/l to 420 mg/l with a mean of 221 mg/l. An inverse relationship exists between stream flow and TDS concentrations. During periods of low flow, when sewage treatment effluent dominates, TDS becomes elevated and conversely when flows are high, sewage treatment effluent is diluted with water containing lower TDS from Lake Ray Hubbard and runoff. Sulfate and chloride concentrations also exhibit an inverse relationship with stream flow. Sulfate concentrations for Water Years 1973-1976 ranged from 10 mg/l to 67 mg/l with mean value of 33.5 mg/l. Chlorides during the same period range from 6 mg/l to 67 mg/l with a mean of 24.9 mg/l.

Nutrients: Ammonia, Nitrate and Phosphate Although no standard exists for ammonia in the East Fork, it is a contributing factor to the poor water quality. Ammonia contributes to the total oxygen demand, reduces the effectiveness of chlorination, stimulates vegetation growth, and when in an un-ionized state, is

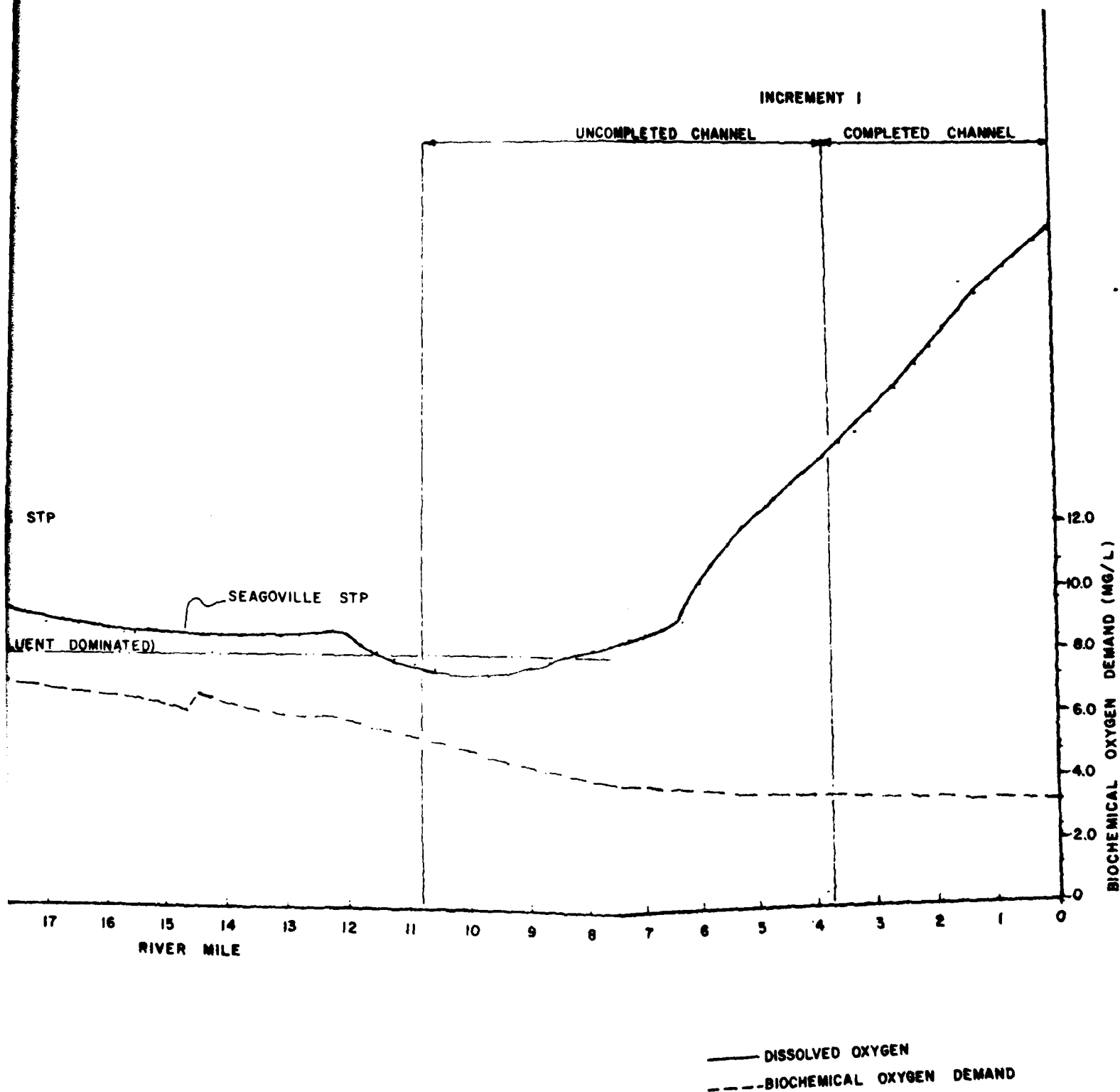
EAST FORK WATER QUALITY
FUTURE TREATMENT LEVEL
PRESENT CHANNEL MORPHOMETRY



^u INCLUDES ANTICIPATED INCREASE IN LOW FLOW (EFFLUENT) VOLUME

SOURCE: By Texas Department of Water Resources through North Central Texas
Council of Governments for Fort Worth District, Corps of Engineers (July 78)

WATER QUALITY PROJECTIONS
TREATMENT LEVELS (10-15-10)²¹
NEL MORPHOMOTERY (Without Completion of Increment I)

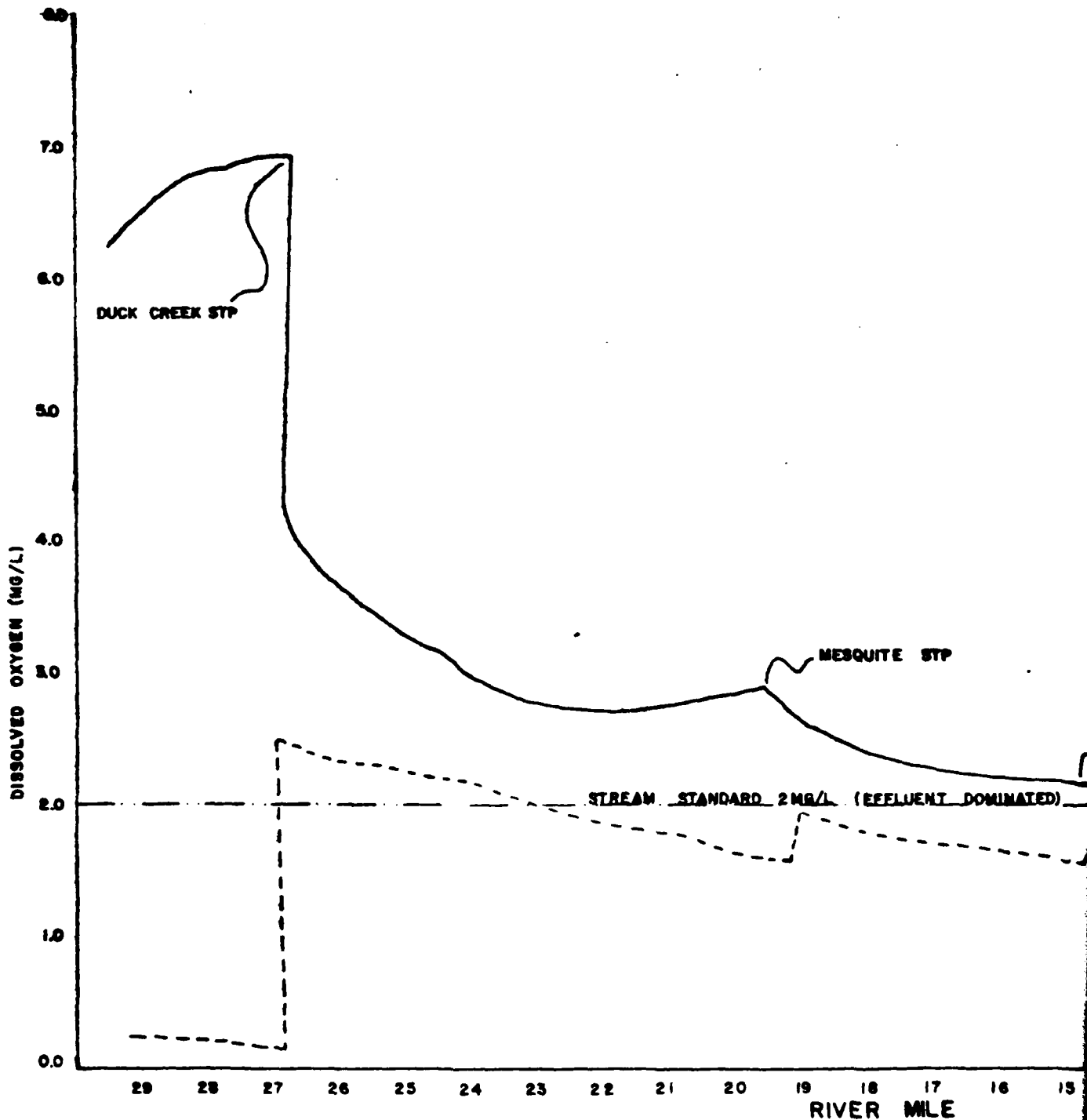


A-1-30

2

TABLE 7

EAST FORK WATER QUAL
FUTURE TREATMENT LEV
PRESENT CHANNEL MORPHOMOTERY



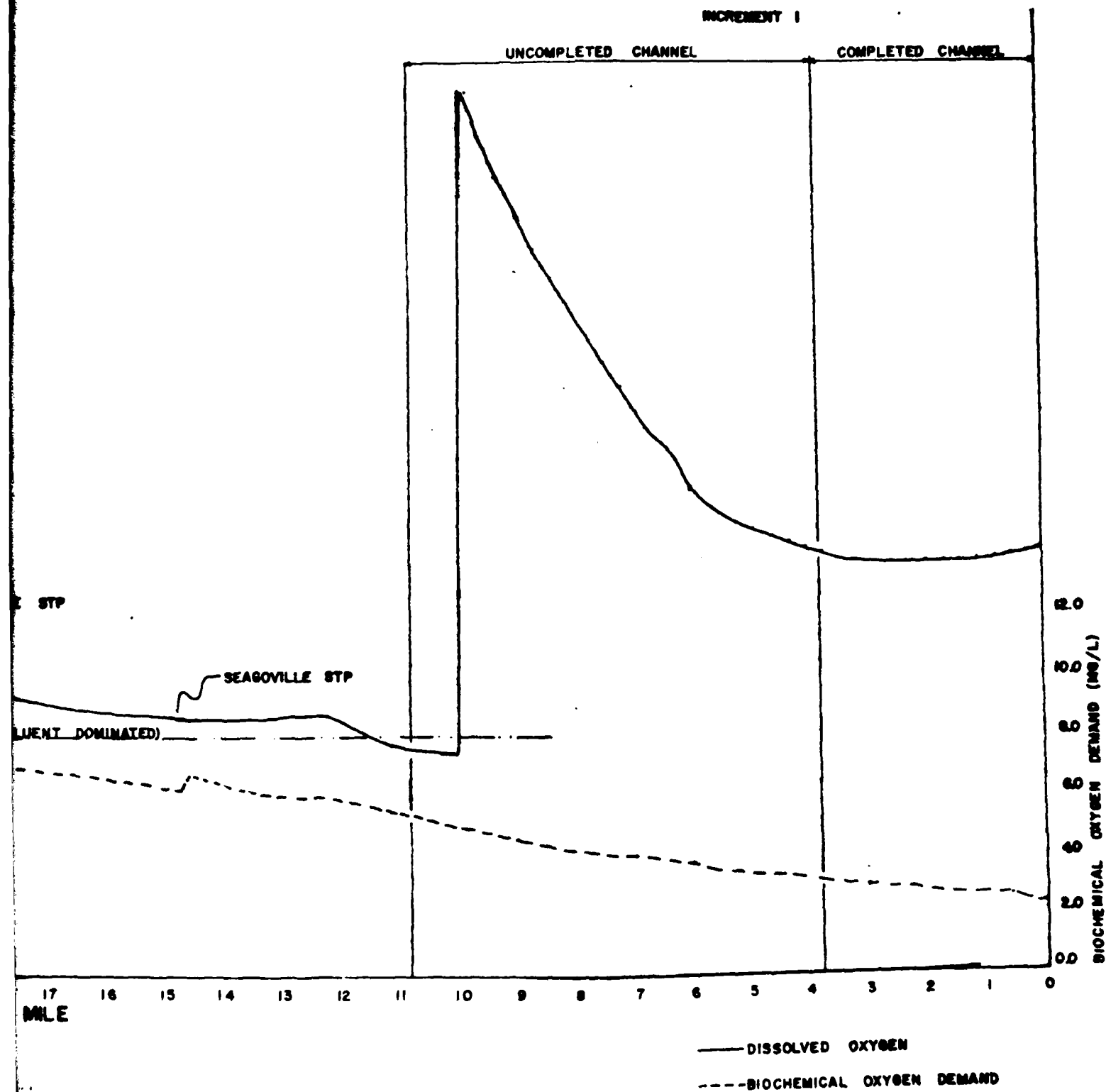
1) INCLUDES ANTICIPATED INCREASE IN LOW FLOW (EFFLUENT) VOLUME

2) DEPTH, WIDTH, AND VELOCITY PARAMETERS FROM R.M. 3.75 TO R.M. 10.0 WERE MODIFIED TO REFLECT THOSE OF THE PROPOSED CHANNEL.

SOURCE: By Texas Department of Water Resources through North Central Texas Council of Governments for Fort Worth District, Corps of Engineers (July 78)

A-1-

WATER QUALITY PROJECTIONS
TREATMENT LEVELS (10-15-10)^U
MORPHOMOTERY (With Completion of Increment I)^U



A-1-3)

2

TABLE 8

toxic to aquatic life. Ammonia concentrations for Water Years 1973-1976 ranged from .03 mg/l to 17.0 mg/l, and are a direct result of sewage treatment effluent. A direct relationship to the percentage of ammonia and flow contributed by sewage effluent is apparent. EPA water quality criteria specify a limit of .02 mg/l (as un-ionized ammonia) for freshwater aquatic life. At a water temperature of 20°C and a pH of 7.0, any value of total ammonia ($\text{NH}_3 + \text{NH}_4$) greater than 5.0 mg/l gives a free ammonia concentration greater than the .02 mg/l criteria. Thus, many ammonia concentrations in the East Fork exceed EPA freshwater aquatic life criteria.

Nitrate and phosphate concentrations are not covered in standards that apply to East Fork water quality. Although nitrates and phosphates do not constitute a pollution hazard directly, they contribute to nuisance algae growth and elevated plankton levels in streams and lakes. Nitrates constitute a potential hazard only when they exist in an environment where they are reduced to nitrites. Phosphates are considered a potential problem to nuisance algal growth in flowing streams at concentrations of 100 mg/l or greater (Mackenthun, 1973). Nitrate nitrogen levels were generally low and range from 0.0 mg/l to .58 mg/l (Water Years 1973-1976) with a mean concentration of .13 mg/l. The relationship of nitrate levels to flow conditions appears to be opposite to trends of most other parameters discussed with the highest concentrations occurring during high flow conditions.

Phosphate concentrations in the East Fork were highly variable in nature, ranging from 0.0 mg/l to 67.3 mg/l for Water Years 1973-1976. The mean phosphate concentration for this period was 4.23 mg/l with a standard deviation of 11.7 mg/l. Although the mean total phosphate concentration greatly exceeds the recommended limit (.1 mg/l) for prevention of nuisance algae growth, algae growths do not appear to be a problem in the East Fork, possibly due to the variable nature of phosphate concentrations and high turbidity.

Fecal Coliforms Seventeen fecal coliform samples were collected at station 0819.01 from 1972-1976 (see table 6). The range of fecal coliform count, expressed as number of organisms per 100 ml, varied from 0 to 240,000, with a mean of 66,404 and a standard deviation of 83,894. The fecal coliform standard of 2,000 for the East Fork applies to the logarithmic mean of data from at least five representative samples collected during not more than 30 days; thus, the current data collected at TWQB station 0819.01 cannot be used to determine noncompliance with the 2,000 standard. The standard also requires, however,

that variations in fecal coliform count be limited to 4,000, which is not to be equaled or exceeded in more than 10% of the samples. Of the 17 samples collected at station 0819.01, 13 (76%) exceeded the variation requirement. A log. mean fecal coliform concentration of 47,000 is reported for data collected at several stations on the East Fork for years 1974-1976 (see table 6).

Conclusions Data contained in tables 5 and 6 show that the lower East Fork of the Trinity River meets stream standards for temperature, pH, TDS, chlorides and sulfate concentrations. Table 5 indicates that the dissolved oxygen standard is violated somewhere between 30% and 50% of the time. Table 5 also shows that 76% of the fecal coliform samples collected violated the variation requirement. Table 5 lists a log mean fecal coliform count of 47,000 for 26 samples collected from 1974 to 1976, which exceeds the 2,000 limit specified in the standards by a factor of 10. Also, numerous fecal coliform samples collected in the lower East Fork during a two week period in 1976 and analyzed by the NTMWD, indicated a log mean coliform count in excess of 400,000 organisms/100 ml.

Other parameters which are not regulated by the standards, but which contribute to the poor water quality in the East Fork include BOD and nutrients. Values of free ammonia and phosphates periodically exceed EPA water quality criteria for fresh water aquatic life and prevention of nuisance algae growth. High BOD loadings, due to waste treatment effluents, contribute to the oxygen demand and subsequent depletion of dissolved oxygen in East Fork waters. Low values of dissolved oxygen and higher values of other chemical parameters tend to occur during periods of low flow when sewage effluent represents the major flow input.

Ground Water Resources The two major ground water producing formations in northeast Texas are the Woodbine and Trinity group aquifers. In the vicinity of the study area, these two major ground water producing aquifers are on the downdip and vary in depth between 1,500 and 4,000 feet. Due to the excessive depth of these aquifers in Kaufman County, and due to chemical characteristics of ground water extracted from these deep aquifers, the quantity and quality of ground water is somewhat limited in Kaufman County except for shallow wells of limited capacity. Municipal usage of ground water in Kaufman County has decreased from 224.6 acre ft. in 1955 to 0 acre ft. in 1966. Presently, in Kaufman County, groundwater is not used for municipal or industrial purposes but generally is limited to shallow wells for domestic and agricultural usage. No data are available on ground water usage in the lower East Fork study area, and it is expected that few

if any wells exist on the flood plain itself. Ground water usage in the study area is probably limited to shallow domestic usage wells located in the uplands near the flood plain.

The ground water level in the study area ranges from near the surface at the mouth of the East Fork to depths of up to 120 feet near the upper end of the study area. Average depth of the water table varies in the lower East Fork flood plain from 6 to 12 feet, depending on extent and duration of flooding and precipitation. Data on chemical quality of study area ground water is limited, although a Texas Department of Water Resources observation well is located approximately 3 miles east of the lower East Fork near Warsaw. Data from this shallow well, which has a depth of 36 feet, indicate the ground water is of moderate hardness (495 mg/l) and dissolved solids (796 mg/l) and of acceptable quality for domestic usage.

Ambient Air Quality The East Fork of the Trinity River project area lies within an air control basin which includes Dallas and Tarrant Counties and the surrounding counties of the metroplex. As such, it is subject to the same air quality standards as those of the metropolitan areas of Dallas and Fort Worth. The Texas Air Control Board (TACB) has designated a system of priorities to identify regional air quality problems within air basins. Priority I identifies areas with severe pollution problems, Priority II identifies areas of moderate pollutant levels, and Priority III identifies areas with no significant pollution problems. The priority system is applied to concentrations of sulphur dioxide (SO_2), carbon monoxide (CO), nitrogen oxide (NO), particulate contaminants, and hydrocarbon oxidants.

Analysis of general air quality in the Dallas-Fort Worth Air Basin indicates that sulphur dioxide, carbon dioxide and nitrogen oxide levels are classified as Priority III--no significant problem. Particulate contamination has been identified as Priority II--a moderate problem. Hydrocarbon oxidants, often associated with urban environment are classified as Priority I. Hydrocarbon oxidants frequently are a severe problem in urban areas as a result of vehicular traffic and when affected by strong sunlight and proper atmospheric conditions, are the cause of high concentrations of ozone in the area. Air quality of the Dallas-Fort Worth Air Basin is relatively good. For this reason and because the East Fork Project area is located approximately 30 miles from concentrated urban center of Dallas, air quality at the project area is probably high throughout the year.

Ambient Noise Levels Ambient noise levels within the project area are typical of those of most rural areas. Ambient levels were monitored during May 1977 using a Bruel and Kjaer Model 2205 Sound Level Meter. All measurements were taken in decibels on the "A" scale (dBA), and all data were processed to determine the L_{10} (noise levels exceeded less than 10 percent of the time). Readings were taken during mid-day at four sites within and adjacent to the project area. Three sampling sites were at locations on Trinity Valley Ranch, and one along the east levee near County Road 3039 (see figure 2).

Results of all readings (in dBA L_{10}) showed noise levels within the area to be typical of most rural regions during daylight hours. The County Road 3039 station was located approximately 200 meters south of County Road 3039 along the eastern levee (K-5). Readings at the location were 55 dBA generated primarily from occasional aircraft and vehicle noise as well as considerable wildlife activity. A station was established at the west side approach to the Trinity Valley Ranch bridge to Sand Hill. Noise level readings at the location were 39 dBA influenced by distant wildlife in the wooded areas. The Sand Hill station was established to determine noise levels at an area along the east side levee on Trinity Valley Ranch. During the analysis, noise from a single engine airplane and from wildlife significantly attributed to readings of 43 dBA. To ascertain typical noise levels to be expected within an area near the riverbottom on the west side of the project area, a station was established east of Trinity Valley Ranch headquarters. Specifically, the site was 610 meters from County Road 1389 where county maintenance ends. Noise levels at the location were 47 dBA.

BIOLOGICAL SETTING

Terrestrial Habitats and Vegetation. Two terrestrial habitats are dominate throughout southwestern Kaufman county: an upland prairie and a flood plain woodland. The upland prairie covers the greatest portion of this region; however, the study area lies primarily in the flood plain woodland habitat.

The upland prairie is the habitat associated with the Blackland Prairie physiographic province. Typical vegetation of the upland prairie regions are little bluestem, big bluestem, Indian grass, switchgrass, sideoats grama (Bouteloua curtipendula), hairy grama (Bouteloua hirsuta), tall dropseed (Sporobolus asper), silver bluestem and Texas winter grass (Correll and Johnston, 1970). Post oak and blackjack oak increase on the medium to light-textured soils, and are found as dominant trees on the uplands on the west bank of the East Fork where pastureland is predominant.

The East Fork flood plain in the study area contains approximately 3,000 acres of woods, and thick understory is predominant throughout. The river bottom provides what is best described as a lotic community habitat. Frequent floods and general lack of use during the 50 years since levee construction have created a mature woodland region which, in some areas, is near early climax stage. The wooded river bottom is largely composed of oak, hickory and pecan hardwoods, as well as ash, box elder, willow and cottonwood. General vegetation species within the river bottom and upland regions of the project site consist of a variety of oaks, ash, cedar elm (Elmus crassifolia), bois d'arc (Maclura pomifera), and mesquite. Hardwood timber within the Lower East Fork and some areas of the sloughs to the east of the project site is nearing early climax stage with dominant or co-dominant pecan. Understory of the region is primarily of box elder and mulberry.

Habitat within the denser woods of the river bottom and within limited areas at Ezell Slough, Pecan Slough and the Old East Fork of the Trinity east of the levee (K-5) offers excellent protection for numerous furbearing mammals and birds. Along the water's edge, water oriented invertebrates and herpetological species can be observed. Regions within the cleared portions of the river bottom are attractive as they provide excellent food sources. Successional stages of understory plant growth along these areas make them ideal for small animals and rodents as well as numerous passerine birds. Although there are numerous pastures within the general area of the project site to provide similar wildlife habitat, the cleared bottomlands are additionally important to the support of raptor avian wildlife.

Habitat within the river bottom has been altered during recent years by extensive channel and levee rights-of-way clearing.

Resulting from the work previously undertaken within the project area, 275 acres have been cleared for channel right-of-way, and 177 acres are cleared along the levees and various haul routes. These cleared areas offer a unique and distinctive habitat within what was once a bottomland forest.

Wildlife. Increment I of the East Fork of the Trinity River is a narrow, turbid, meandering stream that has been leveed for several decades and is located in a wooded river bottom providing diverse habitat for abundant wildlife. In one particular congested area, a true definition of a main channel is lost and is replaced by a wide braided set of channels interspersed with bars and marshes. In this area numerous herons, egrets, and ducks have found excellent habitat. This area also provides excellent habitat for aquatic oriented mammals of the area such as nutria and beaver. The stream is densely lined with swamp privet and mulberry along its immediate banks with ash being the predominate overstory, with some pecan, willow and cottonwood. The cleared areas are covered with old field species such as Rubus sp. and sumac. Those areas, recently cleared for channelization right-of-way, provide habitat representative of early successional stages. Box elder is very prevalent in the understory. Numerous red-eared turtles can be seen along the muddy banks of the river. Other reptiles observed were cottonmouth, alligator snapping turtle, box turtle and sliders.

Dominant Mammal Species. Mammals most representative of the flood plain woodlands are squirrel, raccoon, opossum, mink, fox, beaver, various small rodents, armadillo and rabbit. Some of these are sought, to a limited extent, for game or as furbearers. Clearings made for rights-of-way have created substantial new habitat for rabbit and small rodents. In the woodlands there is little forage available on the ground due to the shading from the overstory. However, when these trees were cleared for channel right-of-way this enabled many low growing forbs and herbs to populate the area providing massive amounts of food and cover close to the ground, thereby allowing support for a massive rodent population.

Dominant Bird Species. Birds most representative of the flood plain woodlands are various woodpeckers, Barred Owl, Carolina Chickadee, Tufted Titmouse, Cardinal, Carolina Wren, Common Crow and Blue Jay. Clearing for the channel right-of-way has created substantial new habitat for bird species inhabiting early successional areas. The sumac, Rubus sp., and various legumes found within the cleared areas have provided enormous amounts of previously limited food and cover for species such as Field Sparrow, American Goldfinch, various warblers, blackbirds and other sparrows. The openness of these areas has also attracted birds of prey such as

the Marsh Hawk and Broad-winged Hawk.

Winter species include geese, Mallard and other waterfowl. The inundated areas in the bottomland provide excellent habitat for these birds including the Wood Duck, a permanent resident. The geese including Snowgeese utilize the area primarily for resting as they feed in nearby fields and are only in the East Fork area a short time during migration. Wood Ducks and Mallards are probably the primary waterfowl species utilizing the area. The East Fork provides excellent habitat for summer residents such as the Little Blue Heron and Snowy Egret. These species were abundant along the East Fork, particularly in inundated areas adjacent to the river. Also, numerous Spotted Sandpipers were frequently observed along the river.

Dominant Reptile Species. The East Fork of the Trinity River is extremely diverse in herpetofauna. Upon site visitation, many species were observed (red-eared turtle, snapping turtle, alligator snapping turtle, box turtle, slider and cottonmouth). These herptiles were sited all along the open river banks as well as tree covered areas. None, however, were sited far from the river.

Aquatic Habitats. Three aquatic habitats are found in the study area. These include the free flowing stream, several impoundments, and numerous aquatic areas including marshes and sloughs. Of the 10.8 miles of river channel in the study area, about 4 miles have had vegetation clearing and channel modifications accomplished. Along the reach of the river thus affected, the aquatic habitat is degraded with low productivity. As a result, benthos and fish present within the region are limited and species diversity is low.

As a result of 50 years with little disturbance, the other 6.8 miles of river channel has an established riverbank vegetation habitat ideal for many species of fish and mammals. Only the relatively poor quality of the East Fork of the Trinity water limits what could be a highly productive aquatic environment. Such water quality constraints are characterized by low dissolved oxygen and high coliform concentrations. The general environment of the oxbow areas of the East Fork are, however, enhanced by numerous logjams which serve to restrain water flow and create refuges for young fish and amphibians. These logjam areas create turbulence in the river resulting in increased aeration beneficial to aquatic wildlife.

Approximately 22 acres of impounded or semi-impounded water can be found in the project area (5 acres of which are at the Route 3039 bridge crossing). These impounded water bodies are often shallow, moderately vegetated by macrophytes and contain relatively good water

quality as most receive runoff from rain rather than polluted river water. Indicative of the habitat quality of these areas is the fishing success of local residents frequenting the area. During recent visits to the project site, numerous fishermen were seen bankfishing at the pool below Route 3039 and at pools along the levee. Fish catches were primarily buffalo and carp. At no time were fishermen fishing along the channel portions of the river. These observations suggest that the pools are relatively good fish habitats and are likely to be breeding grounds.

Marshes and sloughs throughout the flood plain support the greatest diversity of plants and animals of any habitat in the region. Field reconnaissance of the flood plains reveals the presence of many sedges, forbs and small trees (willow sprouts) capable of supporting large numbers of aquatic and semiaquatic wildlife.

Stream Bottom Organisms. Benthic invertebrates are the insect larvae, mollusks, worms and other organisms which exist on or in the bottom substrate of a river or other body of water. Many species can actively crawl, swim or move slowly along the bottom with muscular appendages (mollusks). Others are entirely sessile. As a group, however, they are relatively immobile and are therefore good indicators of environmental conditions. Three sites on the East Fork of Trinity River were sampled for benthic macroinvertebrates during the latter part of April 1977. (Figure 2) The sites were sampled with a 9" Eckman dredge, field sieved and preserved in ethanol for later laboratory analysis. Three replicate samples of each station were collected to determine variability within each benthic community.

Benthic sampling at sites on the East Fork Trinity River showed a distribution of macroinvertebrates dominated by Diptera - 64%, Oligochaetes - 20%, Mollusks - 14%, and Ephemeroptera - 2%. (Table 7) The majority of the Diptera larvae (flies, mosquitoes, and midges) found in the East Fork are represented by the family Chironomidae. In the family Chironomidae, the main representative is Chironomus. These organisms occur everywhere in aquatic vegetation and on freshwater bottoms. Chironomid larvae are chiefly herbivorous and feed on algae, higher aquatic plants, and organic detritus.

The freshwater Oligochaetes (aquatic earthworms) are common in the mud and debris substrate of stagnant pools and ponds and in all streams and lakes and are often associated with anaerobic and (or) polluted conditions. The Oligochaetes occupy a niche equivalent to that occupied by terrestrial species of the same group; soft substrate is preferred by these deposit feeders as they selectively feed on bottom sediments. High oxygen concentrations are not generally required as many genera of the aquatic Oligochaetes can survive in low oxygen concentrations. Some genera can withstand the

TABLE 9. NUMBER OF BENTHIC ORGANISMS PER SQUARE METER IN 3 SAMPLING STATIONS OF THE EAST FORK OF THE TRINITY RIVER

<u>STATION 1</u>		<u>ORGANISMS/SQ. METER</u>
Diptera		115
Oligochaeta		13
Mollusca		0
Ephemeroptera		6
<u>STATION 2</u>		
Diptera		83
Oligochaeta		6
Mollusca		0
Ephemeroptera		0
<u>STATION 3</u>		
Diptera		6
Oligochaeta		45
Mollusca		45
Ephemeroptera		0
<u>SUMMARY OF BENTHIC ORGANISMS COLLECTED</u>		
Diptera	32	64%
Oligochaeta	10	20%
Mollusca	7	14%
Ephemeroptera	1	2%

complete absence of oxygen for extended periods. The deep pool stations sampled in this study typically have substrates composed of silt, and dissolved oxygen concentrations that approach zero following summer stagnation. These physicochemical factors probably explain the low diversity and dominance of the Oligochaetes at these stations. The cold temperatures and increased pressure characteristic of these deep stations further influence the structure of the benthic community.

Snails (gastropods) and bivalve mollusks (pelecypods) are most abundant in the shallows areas. Stable gravel, sand, and other finer substrates, as found at Station 3, are more conducive for mollusks in inhabiting an area. Mollusks need a porous type of substrate to penetrate and establish themselves. At Stations 1 and 2 no mollusks were collected. The limiting factors for their growth could be a large amount of detrital matter and the hard, impenetrable substrate found at these stations.

One Ephemeroptera (mayfly) was found at Station 1. Mayflies are generally intolerant of pollution and require reasonable amounts of dissolved oxygen. With dissolved oxygen levels which are often low, it is not probable that these insects normally dwell in the project area. When these samples were taken, it was a relatively short period of time after a major flooding event (20-yr. storm), and it could be, that the mayfly was washed downstream along with other debris and settled out on the bottom.

It can be summarized that the benthic community is at present limited in diversity due to organic materials, nutrients and sediments entering the river. Although there is no comparative historical data of benthos, if the river were not subject to oxygen depletion and occasionally heavy sediment concentrations, the benthic community probably would diversify and permit development of a better fish community than is present.

Fish. The numbers and diversity of fish along the East Fork of Trinity River can be attributed to 1) frequent flooding, 2) available habitats, and 3) water quality degradation due to high sewage input relative to river flow rates. An average low dissolved oxygen level, (2.1 mg/l based on 2 years of data of the East Fork), appears to be the major limiting factor of fish species. The proposed EPA water quality criteria to maintain good fish populations is a minimum concentration of dissolved oxygen of 5.0 mg/l. (Quality Criteria for Water, 1976).

No fish sampling surveys have been made within the project area. However, bank fishing for buffalo and carp is considerable in proximity to the County Road 3039 crossing. Numerous gar (species

undetermined) were observed throughout major stretches of the river during field work conducted in April 1977.

Fish samples were taken in 1950 at locations within proximity to Malloy Bridge located 2 miles north of Increment I. Sampling was done using a small mesh minnow seine. River characteristics reported at the time were a strong current, high turbidity and a silty bottom. Dominant fish taken during the survey were gizzard shad, three species of minnows and two species of shiners. Also found were freckled madtom, dusky-darter and large mouth bass. As these latter species are intolerant of turbid waters with low oxygen content, it is doubtful if they can be found in the river at this time. Table 10 gives a complete list of fish taken during the 1950 survey.

Numerous surveys were taken within the Trinity River mainstem from the confluence of the East Fork of the Trinity to Cedar Creek by Texas Parks and Wildlife Department personnel. The surveys were conducted at various times of the year during 1972, 1973 and 1974 using a 3,000-volt electrofishing unit. Three species of gar were found to be dominant with the longnose gar generally most common. Carp and smallmouth buffalo were taken during two sampling periods (December 1973 and December 1974) and shad, drum and sunfish were taken during December 1973 (unpublished data from Texas Parks and Wildlife Department). Table 11 lists numbers of each species taken by Texas Parks and Wildlife Department.

Comparison of fish taken during the 1950 survey within the East Fork of the Trinity to those recently taken in the Trinity mainstem indicate that fish species in the area are generally limited to air-breathers or species tolerant of low oxygen content and high pollution levels. For this reason, dominant fish within the East Fork of the Trinity are carp, gar, shad and buffalo.

Vectors. Vectors, organisms that carry and transmit parasites, can ultimately transmit disease to man and/or his domestic animals. In relation to the study area, the topic of vectors must directly address those insects primarily associated with aquatic areas, oxbows, and wooded lowlands. The two basic disease vectors in the study area are the Southern house mosquito; Culex quinquefasciatus, primary carrier of the St. Louis type encephalitis, and Culex tarsalis, primary carrier of Western encephalitis. However, both species are able to transmit either type of disease. Secondary carriers of encephalitis are the Culex restuans and Culex salinarius, both of which carry the two types of Equine Encephalitis. Culex lays her eggs in small packets or rafts on the surface of standing or slowly moving water, such as found in many of the meanders along the East Fork of the Trinity River. However, in the past 10 years, there have only been 24 cases of St. Louis encephalitis, 2 of which were in 1976; and 1 case of Western encephalitis reported in Kaufman County.

TABLE 10. 1950 SURVEY OF FISH FOUND IN THE EAST FORK OF THE TRINITY RIVER. (COLLECTED BY SMALL MESH MINNOW SIEVE)

AUGUST 1950	NUMBER TAKEN	
Blackstripe Top Minnow	25	
Bullhead Minnow	17	52
Pugnose Minnow	10	
Red Shiner	27	
Golden Shiner	14	41
* Gizzard Shad	67	
** Catfish	9	
Black Bullhead	17	35
Yellow Bullhead	8	
Stoneroller	22	
Mosquito Fish	34	
Bluegill	12	
White Crappie	18	
Large-Mouth Bass	9	
Dusky Darter	11	
** Big Mouth Buffalo	19	
* Carp	10	
Freckled Madtom	5	

* Fish found in 1972-1974 survey (Table 10).

** Fish not found in 1972-1974 survey, but believed to be in East Fork area according to fisherman's findings.

Source: Fullwood, 1950.

TABLE 11. 1972-1974 SURVEY OF FISH FOUND IN THE TRINITY MAINSTEM FROM EAST FORK TRINITY CONFLUENCE TO CEDAR CREEK ** (COLLECTED BY 3,000 VOLT GENERATOR ELECTROFISHING EQUIPMENT).

	NUMBER TAKEN
January 1972:	
Longnose Gar	39
September 1972:	
Longnose Gar	1
December 1972:	
Longnose Gar	5
Spotted Gar	2
Alligator Gar	1
December 1973:	
* Gizzard Shad	1
Freshwater Drum	2
Smallmouth Buffalo	11
* Carp	2
Longear Sunfish	1
Orange Spotted Sunfish	1
Long Nose Gar	4
December 1974:	
Smallmouth Buffalo	2
* Carp	3
Longnose Gar	2
Spotted Gar	1
April 1974:	
Longnose Gar	1
Spotted Gar	2

* Fish taken in 1950 survey of upper East Fork (Table 9).

** Unpublished data from Texas Parks and Wildlife.

The Anopheles quadrimaculatus, primary carrier of malaria, is also found in this area. However, it does not present a serious problem because malaria has almost been eradicated in the United States. Only one case of malaria has been confirmed since 1967. However, this species of mosquito, like many insects, can be a problem due to secondary infection and(or) allergies. The yellow fever transmitter or Aedes aegypti, is occasionally found in the area, but is generally associated with urban residents as it breeds only indoors. Two species of ticks found in the project area that are carriers of rocky mountain spotted fever (rickettsia), are the Amblyomma Americanum, (also a potential carrier of tularemia), and the Dermacentor variabilis. Dallas County has reported 24 cases in the same time period. In addition, any tick bite can possibly result in tick paralysis. Rats, known carriers of various diseases, are no longer the problem they used to be, primarily because the bubonic plaque, carried by fleas, has been controlled in this country, and no case has been reported in this area since 1920. Flea-borne typhus is also vector transmitted and is found in every county in the state. In Dallas County, there was one case confirmed in each of five different years.

Endangered and Threatened Species. The probability of the occurrence of any endangered or threatened plant or animal species in the study area is small. The only endangered or threatened species of wildlife, based on Federal and State lists, which is likely to occur in the area of the East Fork Trinity is the Southern Bald Eagle. The Southern Bald Eagle feeds mainly on dead fish and other carrion. In Texas, most are associated with reservoirs while feeding. They nest in tall trees, usually pecan, along river bottomlands. No known nests are in the area, however, several large reservoirs north of the site provide ideal habitat for the species. Furthermore, due to the large range of Bald Eagles, it is possible that they may occasionally occur in the vicinity while feeding or during migration.

The Texas Parks and Wildlife Department in cooperation with the Rare Plant Study Center at the University of Texas at Austin has published "Rare and Endangered Plants Native to Texas". The listing of rare and endangered plants was derived through the joint input of numerous botanists throughout the states and with the technical assistance of the Resource Management Section of the Texas Parks and Wildlife Department, (The University of Texas at Austin, 1974). Four taxa (species) with ranges in north central Texas could occur within the project area. Records for each of the four species show collections within Dallas County, but none of the species have been collected within Kaufman County nor were they observed during the field inspection. These plant species include: Carex hyalina (Tissue Sedge),

Isoetes melanopoda (Black-footed Quillwort) and Phlox oklahomensis (Oklahoma Phlox), all listed as "very rare, acutely endangered in Texas", and Carex physorhyncha (Hidalgo Sedge), classified as "scarce, endangered in Texas".

SOCIAL AND ECONOMIC SETTING

Current Land Use. Land in the study area is generally wooded or used for agricultural purposes. Land use data for the 4,424 acre study area were developed using recent aerial photographs supported by ground reconnaissance. The study area extends from the Texas and New Orleans railroad bridge to the confluence of the East Fork with the mainstem of the Trinity River. The eastern boundary was established as the riverside toe of existing levees. The western border was defined as the break in slope between the flood plain and the valley wall.

Eight categories of land use were identified within the study area as shown in Table 12. Major portions of the project area remain as dense woodlands of ash, pecan, cottonwood and box elder with a thick understory. These woodlands comprise more than one half of the entire project area and total 2,975 acres. Pastureland, located within limited areas adjacent to Kaufman County Levee District No. 5 and the lower portions of the project area southwest of Rosser total 673 acres. These pasturelands are subject to periodic flooding, and cattle are forced to seek refuge along the levee slopes and within areas protected by the levees. Because much of the project is subject to extensive flooding and is often saturated with water over extended periods of time, cultivated crops are not generally raised. A relatively small portion of the region (an area near the Trinity River mainstem southwest of Rosser) does provide minor crop production for hay and totals approximately 80 acres.

The other major category of land use in the area results from previous construction efforts. About 178 acres have been cleared for levee modification and construction access and haul roads. Another 275 acres have been cleared for channel right-of-way, mostly through areas which were previously woodland.

Approximately 50 landowners in or near the study area would benefit from project improvements reducing the extent and frequency of flooding. These owners are listed in table 13 and properties are shown in figure 9.

Population Characteristics. No people reside within the immediate study area due to the frequent flooding which occurs. A few farm and ranch homes are located adjacent to the study area, either in the uplands or behind existing levees. Southwestern Kaufman County in which the study area is located is a rural region with a population density of approximately 7.5 persons per square mile.

Only a few small population centers are situated near the project. The town of Crandall is approximately 4 miles from the

U. S. ARMY

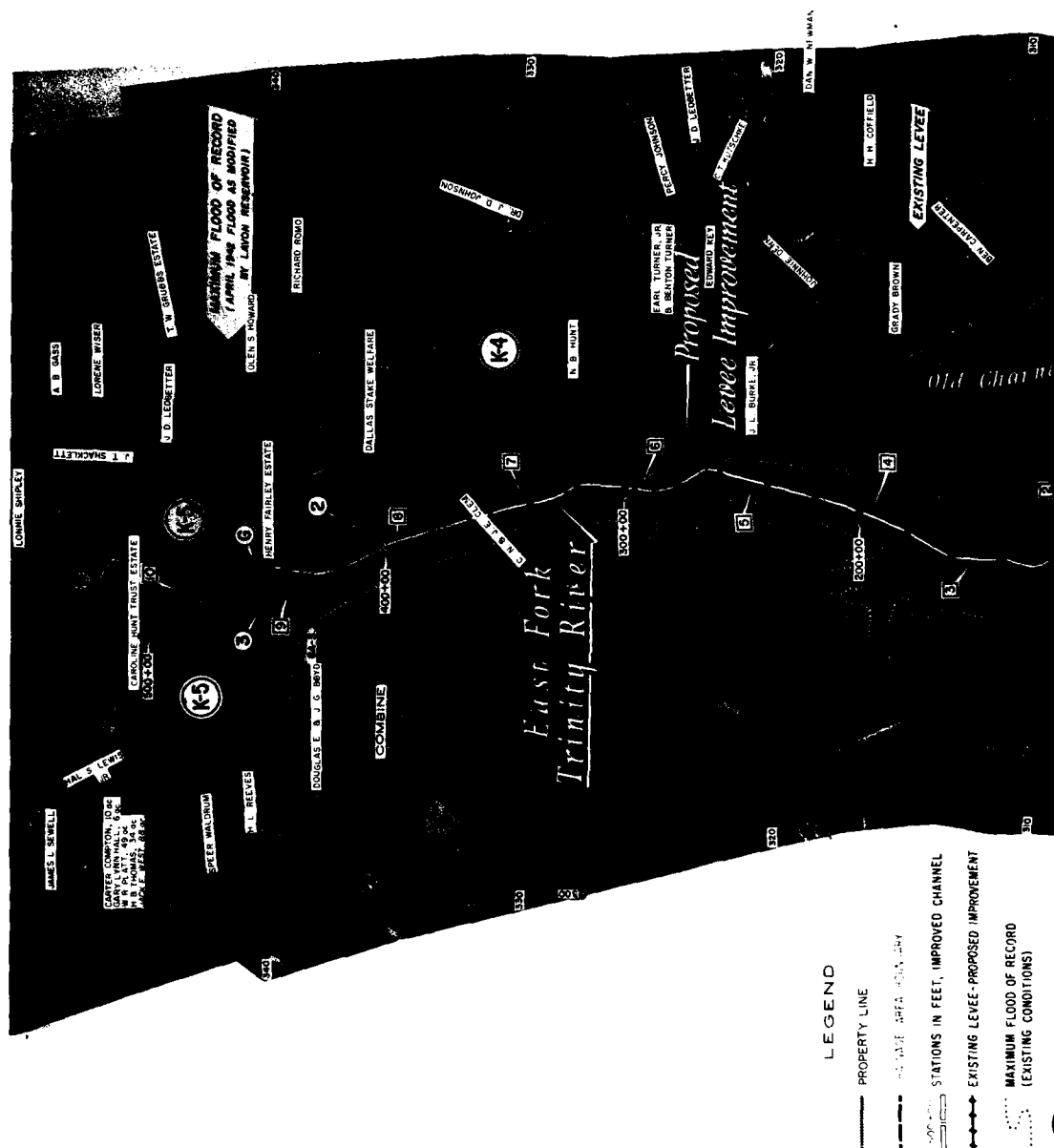




TABLE 12. LAND USE WITHIN INCREMENT I PROJECT AREA.

CLASSIFICATION	ACRES	PERCENT OF AREA
Woodland	2,975.7	67
Pastureland (Includes some lightly wood areas)	673.3	15
Cultivated land	80.3	2
Powerline-pipeline easements	23.4	1
Brushland	197.4	4
Pooled water	21.6	1
Cleared for levee and haul routes	177.7	4
Cleared for channel right-of-way	275.2	6
Total project area acres	4,424.6	

TABLE 13. LANDOWNERS WITH PROPERTY WHICH WOULD BE PROTECTED
BY PROJECT IMPROVEMENTS.*

** Fred F. Alford, Jr.	** John E. Jones
Douglas E. and J. G. Boyd	** Dr. J. D. Johnson
** Grady Brown, Jr.	** Percy Johnson
** J. L. Burke, Jr.	Edward Key
** Ben Carpenter ^{1/}	** C. T. Kutschke
** B. M. Clayton	** J. D. Ledbetter
C. N. & J. E. Clem	Hal S. Lewis, Jr.
James E. Cochran	Mrs. Evelyn Lowry
** J. D. Cobb	Dan W. Newman
** H. H. Coffield	** Farce E. Pickard
** Dallas Stake Welfare	M. L. Reeves
** Albert L. Davis	** John Robertson Estate
** Wirt Davis	Richard Romo
** Johnnie Denn	** S. B. Sawyers
** Henry Fairley Estate	James L. Sewell
** Eriebet Fleck	J. T. Shacklett
A. B. Gass	Lonnie Shipley
** O. L. Graff	** Smith Estate
T. W. Grubbs Estate	H. B. Thomas
Gary Lynn Hall	Earl Turner, Jr. & Benton Turner
** Willie V. Hardin	Speer Waldrum
Olen S. Howard	** William & John Wells
** Caroline Hunt Trust Estate	Jack E. West
** N. B. Hunt	Lorene Wiser
** Phillip N. Jeffers	

* This list is subject to change and is based upon the latest information available from USDA Agricultural Stabilization and Conservation Service.

** Owners with land underlying or adjacent to levee.

^{1/} Trinity Valley Ranch

north end of Increment I, and had a 1970 population of 115. Rosser, located to the southeast of the project area showed a 1970 population of 255 and is immediately adjacent to Kaufman Levee District No. 5. Seagoville, located in Dallas County, is approximately 6 miles northwest of the project area and had a 1970 population of 6,250. Combine, Scurry, Warsaw and Blackland are other small towns located within a 3-mile radius of the study area.

Economic Characteristics. Employment and income at the study area are primarily tied to agricultural production. Historically, the area was heavily used for cotton production. Today, pastures and cultivated fields are largely used to support livestock production. Trinity Valley Ranch, owned and operated by Southland Land and Cattle Company, is the largest single landholder of the area. The ranch extends along major portions of the lower East Fork on the west side of levees and in portions of the east side of the levees east of Sand Hill to below the confluence of the East Fork Trinity and the Trinity mainstem. Although much of the ranch is used as pasture for Hereford and Brahman cattle, portions are cultivated for hay, milo and oats to support livestock production.

Within Kaufman County, about 24 percent of agricultural lands are used for pasture while 49 percent are planted in crops. U. S. Bureau of Census statistics indicate that 41% of the cultivated land is used for hay production and 31% for cotton production. Other crops include milo and wheat. A review of Agriculture Stabilization Service information (Kaufman County office) indicates that the cultivated lands adjacent to the project area, most of which are protected by the levees, are predominantly used for cotton and milo production in the northern and middle regions and wheat and milo within the southern region near the town of Rosser.

Silviculture, once an important economic factor due to flood plain forests of the study area is no longer pursued. According to information derived from residents of the area, numerous lumber mills were located within the region to furnish wood for housing and corral construction. Today, timber cut to clear rights-of-way (powerline, channel construction and levee modification) is burned.

Transportation Facilities. The regional transportation network within proximity to the project site is largely comprised of private and county roads. Route 3039 traverses the project site at river mile 9.21 and connects Combine and Crandall (see Figure 5). Route 1389, located partially in the town of Combine leads to the Trinity Valley Ranch headquarters where county maintenance ends. Along the east side of the project site, county road 148 extends south from Crandall and joins with Route 1390 at Warsaw. Route 1390

connects Warsaw and Rosser, and at one point, approaches the Hillside Diversion Channel near the levee-protected areas west of Scurry. State Highway 34 crosses the Trinity mainstem southwest of Rosser. Review of USGS topographic maps, aerial photographs, and field reconnaissance reveals numerous private roads accessible only after permission from landowners. As with the Trinity Valley Ranch bridge to Sand Hill, these private roads are used and maintained by individuals for agricultural and livestock purposes. Many of these private roads are not trafficable after periods of heavy rain or flooding.

The Texas and New Orleans Railroad lies along the northern terminal portion of the project. The railroad line is currently undergoing track and railbed repair between Crandall and Kaufman, a continuation of earlier work performed west of Crandall. The railroad services the communities of Crandall, Seagoville, Gastonia and Kaufman, and beyond.

Public Utilities. No telephone lines cross the project area. Two high voltage power transmission lines cross the river between river miles 2 and 3, south of Trinity Valley Ranch. Because it is suspended by towers located a considerable distance from the river, it does not directly influence the environment of the area. However, a cleared 150-foot right-of-way is maintained by the power company. A recently constructed natural gas transmission pipeline crosses the levee near Rosser, the leveed flood plain and the Trinity River mainstem. Construction and right-of-way clearing have resulted in a 100-foot clearing through the woodlands within the lower flood plain. Further, the marks of construction can be seen within cultivated fields and pasture lands east of the project area. The pipeline extends from southwest to northeast crossing portions of Ezell Slough and the Old East Fork of the Trinity within the levee protected area east of the project site. It was installed in 1974 to furnish gas to the northeast Texas region from the vicinity of Ennis. Rights-of-way for both the power transmission line and the pipeline are identified on figure 2.

CULTURAL SETTING

Aesthetic Characteristics The Lower East Fork of the Trinity River and its environs are aesthetically pleasing in many ways. The upland area surrounding the flood plain is typical of a tranquil rural setting. Large tracts of land used for cattle production offer vistas of Bermudagrass interspersed with mature post oaks and live oaks. In some upland areas, individual trees are uncommonly large and picturesque in form. Within the sloughs east and west of the region, pecan groves and other hardwood stands provide distinct contrasts to the bottomland pastures and fields. In the study area flood plain, denser woodlands offer a natural setting much different from the open prairie vistas common to north central Texas. These bottom woodlands, marshes and oxbow ponds provide habitat for a diversity of wildlife thereby creating a quiet and pleasant riverine environment.

Recreation The East Fork of the Trinity River is seldom used for recreational purposes. The inaccessibility of the area and close control by local landowners restricts recreational use within the major reach of the riverbottom. Fishermen and occasional small caliber firearms shooters are known to frequent the region along levees south of, and in proximity to, County Road 3039. Fishing is restricted to the river banks for carp and buffalo, and firearms shooting is for "plinking", rather than for small game hunting. Local landowners and their families may occasionally use isolated areas of the riverbottom for some small game hunting; however, it is unlikely that such activities are extensive.

Historical Development The original East Fork of the Trinity was part of an extensive network of streams and aquatic areas comprised of Ezell Slough, Pecan Slough, and Little Buffalo Creek. These low aquatic areas furnished excellent habitat for game species such as white tailed deer, buffalo, bear, and small furbearers. The lower portions of the East Fork have been inhabited by European settlers since the early 1800's. Early settlers raised crops, fished the river and hunted and trapped in the dense woods. Although cotton production became important in the region in the late 1800's, the study area saw limited agricultural use due to frequent flooding. After channel and levee construction in the early 1900's, much of the flood plain was developed for crop production and as pastureland.

Archeology An archeological investigation was conducted along the East Fork of the Trinity River between Forney Dam and the confluence with the mainstem. Because areas of archeological

significance are generally located along riverbottoms, the investigation concentrated along, and in proximity to the area of the Old East Fork of the Trinity River. For this reason, the major emphasis of the study was within Increment II where the Old East Fork and that portion of the proposed channel and levee systems coincide. Two archeological sites of significance are located within proximity of the project area. They are in the vicinity of Sand Hill, located and incorporated into the levee along the east side of the river across from Trinity Valley Ranch, and southwest of Rosser near a proposed levee modification site.

An archeological investigation of the site near Sand Hill reported no concentrations of artifacts, but gray chert flakes, a small jasper cone and fine-grained gray and red quartzite were found. Further, an artifact collector has been reported to have recovered Paleo-Indian points at the site thereby further substantiating the theory that the site may be of archeological importance. Verification of the importance of the site could only be made through testing procedures designed to recover additional archeologically significant items.

The site southwest of Rosser is located near the confluence of the Old East Fork Trinity River and the Trinity Mainstem. As such, it is likely that the site was frequented by Pre-European inhabitants. Field investigations at the area recovered one gray point base, two dozen flakes, and five quartzite cones. These artifacts lend credence to the theory that the site may be of considerable archeological importance. As with the Sand Hill site, further investigation and site testing would be necessary to determine the magnitude and archeological significance of the area.

FUTURE ENVIRONMENTAL SETTING WITHOUT THE PROJECT

Future Environmental Conditions. Changes in the environmental setting of an area are generally attributable to social and economic pressures of development and natural ecological changes over long periods of time. Alterations in the cultural conditions of the area are most often associated with urbanization and(or) industrial development. In the absence of this or some other major project, no significant changes in the environment of the study area are anticipated. The lower East Fork project area is predominantly rural and is projected to remain as an agricultural area with little alteration to the local economy or lifestyle. Changes in the present ecological structure of the lower East Fork river bottom would occur through natural succession as rights-of-way along the proposed channel return to dense river bottom woodlands. With the re-vegetation of the river bottom, wildlife and habitat will return to previous conditions.

APPENDIX A-II

HISTORY OF COORDINATION

The Committee on Public Works of the House of Representatives on 15 May 1957 requested that the Corps of Engineers review the Report on the Trinity River and Tributaries, Texas, and other pertinent reports to determine whether improvement of the East Fork of the Trinity River for flood control and allied purposes was advisable. During the initiation of studies on the East Fork watershed, the regional offices of other interested Federal agencies were advised by letter, dated 20 November 1957, of the general investigation program for fiscal year 1958. The Soil Conservation Service presented the only specific comments on the East Fork of the Trinity River by indicating the availability of basic field data and work plans for its flood retardation and soil conservation program on the watershed. Other interested agencies requested that copies of the proposed report be submitted for field level review and comment.

During the preparation of the report, the District Engineer discussed with local interests the proposed plans of improvement, and results of investigations and studies were discussed with the US Public Health Service, Bureau of Sport Fisheries and Wildlife, National Park Service, and the Soil Conservation Service. They, in turn, provided reports and information relative to elements of the report. The supervisors of Kaufman County Levee Districts Numbers 4, 5, 6, 8, 13, and 15 submitted jointly a letter dated 30 June 1961 indicating their approval of the proposed channel and levee improvement works and stated their intention to initiate action in the interest of organizing an agency under the laws of the State of Texas to qualify itself as the responsible local agency for the items of local cooperation established for the proposed plan of local flood protection.

The draft report was subsequently mailed on 30 August 1961 and was reviewed and commented on by the Bureau of Mines, the Bureau of Public Roads, the Bureau of Reclamation, the Bureau of Sport Fisheries and Wildlife, the Federal Power Commission, the US Forest Service, the US Geological Survey, the National Park Service, the US Public Health Service, the Soil Conservation Service, and the Southwestern Power Administration.

On 13 February 1962 the Chief of Engineers transmitted the report to State and Federal agencies for review and comment.

On 10 September 1962 the Secretary of the Army transmitted the report, dated 29 June 1962, to the Speaker of the House of Representatives fulfilling the Committee on Public Works' request of 15 May 1957.

The Flood Control Act of 1962 (Public Law 87-874) authorized the construction of the East Fork channel, modification of the levees and execution of related work.

A public hearing was held in Wylie, Texas on 22 January 1962 to obtain the views of local interests concerning possible improvements on the East Fork for flood control and allied purposes. This hearing also concerned the Lavon Dam modification.

On 29 December 1967 the general plan for channel rectification and levee improvement was submitted by the Fort Worth District, Corps of Engineers, to higher authority for review and approval.

On 20 August 1968 the general plan of improvement was approved for implementation.

During August 1970 letters were sent to Federal and State agencies for their views and comments concerning the environmental impact of the Lavon Lake Modification and East Fork Channel and Levee Improvement. Their replies were used in the preparation of an environmental statement which was filed with the President's Council on Environmental Quality on 29 March 1971.

With the passage of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500), the Corps of Engineers was given co-authority with the Environmental Protection Agency in issuing dredge and fill permits in accordance with Section 404 of the Act. To issue a permit it is necessary to hold a public meeting concerning the water quality aspects of undertaking a project in or near certain waterways. Such a public meeting was held 23 February 1977 in Kaufman, Texas with 20 representatives making public statements.

This supplement to the environmental statement was prepared to bring to the public's attention information and data which have been collected since the original statement was filed, thereby updating public records.

APPENDIX B

MEMORANDUM OF AGREEMENT



**UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE**

300 East 8th St., Rm. G-121
Austin, Texas 78701

December 14, 1978

Colonel John F. Wall
Department of the Army
Fort Worth District, Corps of Engineers
P.O. Box 17300
Fort Worth, Texas 76102

Dear Colonel Wall: ~~Dear Sir:~~

Our internal review procedures require Washington level coordination of our final comments on the EIS for East Fork of the Trinity River Project.

To facilitate your project schedules however we are providing the enclosed draft comments previously forwarded to our higher review levels.

I want to personally thank you and your staff for your cooperation and most successful efforts in resolving the problems with East Fork. This example certainly demonstrates the new spirit of cooperative operations we both desire.

Sincerely yours,

Joseph R. Higham
Area Manager

Attachments



Save Energy and You Serve America!

UNITED STATES GOVERNMENT

Memorandum

U.S. FISH & WILDLIFE SERVICE

Area Office
300 East 8th St., Rm. G-121
Austin, Texas 78701

TO : Regional Director - Region 2

DATE: December 14, 1978

FROM : Area Manager - Area 1 - Austin, Texas

SUBJECT: Review of Final Supplement to the Final Environmental Statement for
Lavon Dam and Reservoir Modification and East Fork Channel Improvement,
Kaufman County, Texas (ER-78/159)

As you will recall from our past discussions, this item was one which we were contemplating referring to CEQ for resolution. Fortunately with assistance from Regional Solicitor Sanford's office referral action is not necessary as explained in the enclosed draft memorandum for your transmittal to the Director.

Joseph R. Nigham

Attachments



Save Energy and You Serve America!

UNITED STATES GOVERNMENT

U.S. FISH & WILDLIFE SERVICE

Memorandum

TO : Director - Fish and Wildlife Service (EC)

FROM : Regional Director - Region 2 - Albuquerque, NM

DATE:

SUBJECT: Review of Final Supplement to the Final Environmental Statement for
Lavon Dam and Reservoir Modification and East Fork Channel Improvement,
Kaufman County, Texas (ER-78/159)

We regret the delay in responding to your original instructions, however the subject is one which we seriously considered referring to CEQ for resolution. Fortunately with assistance from Regional Solicitor Sanford's office in Tulsa, Oklahoma referral action was not necessary as explained in the enclosed draft memorandum for your transmittal to Director, PEP.

Attachments

cc: Area Manager, Austin, Tx.
ES, Fort Worth, Tx
Regional Solicitor, Tulsa, Ok.



Save Energy and You Save America!

Director, Office of Environmental Project Review

Director, Fish and Wildlife Service, Region 2

Review of Final Supplement to the Final Environmental Statement for
Lavon Dam and Reservoir Modification and East Fork Channel Improvement,
Kaufman County, Texas (ER-78/159)

We regret the delayed response to your original instructions. However, substantive problems existed with this project which we are happy to say have been resolved satisfactory by our field people in Texas and Col. Wall, District Engineer, Fort Worth, Texas. As we understand it, Col. Wall requested verbally a stay of all deadlines on this project with the Chief of Engineers, EPA, and the Council of Environmental Quality pending receipt of these comments.

Our basic problem was twofold-salient changes in the Final EIS as indicated by the word "change" in the attached sheets and settlement of the MOA (Memorandum of Agreement) issue to preserve woodlands in the project area.

Regarding the first, mutually agreed to substitution of the language outlined on the attached sheets (3) completes the adequacy of the Environmental Statement.

Regarding the latter, a review of the revised memorandum of agreement indicates that it comports with the arrangements discussed in the

November 7 meeting between Fort Worth personnel and representatives of the Department of Interior. The language further meets the standards discussed by phone on November 16 (see attached November 27 letter from Berkson, Acting Regional Solicitor).

REVIEW
NOT FOR PUBLIC RELEASE

Please extend our appreciation to Col. Wall for his cooperation and assistance to reassure the U.S. Fish and Wildlife Service regarding protection of the riparian woodlands as part of this project.

Attachments

cc: ES, Washington, D.C.

Regional Director, Albuquerque, NM

Area Manager, Austin, Texas

Field Supervisor, Fort Worth, Texas

Regional Solicitor, Tulsa, Oklahoma

Solicitor, Washington, D.C.

the channel and levee improvement portion of the project was divided into two increments. Both increments were determined to be economically viable as separate projects; i.e., the benefit-cost ratio exceeded 1.0. Local assurances were provided for construction of Increment I. Increment II was placed (and currently is) in abeyance and will not be constructed in the foreseeable future.

Kaufman County Levee Improvement District Number 4 (now called Kaufman County Municipal Utilities District Number 1) and Kaufman County Levee Improvement District Number 5 provided the necessary assurances to go forward with Increment I of the project. Since then the two districts providing assurances on Increment I have obtained the necessary lands and rights-of-way and made the required relocations and alterations.

Change
In response to public comments made at the 23 February 1977 public meeting on the Section 404 aspects of Public Law 92-500, the economics of the Increment I portion of the project were reviewed. Utilizing new economic criteria and field data, the Increment I portion of the project was found to have a benefit-cost ratio of 0.55. The local sponsors have fulfilled their project commitments. In spite of a cost-benefit ratio of less than 1.0, Congress expressed its desire that the project continue by appropriating additional construction funds for Fiscal Year 1979. The overall Lavon Reservoir Enlargement and East Fork Channel and Levee Improvement project as authorized (including Increment I and excluding Increment II) remains economically viable, i.e., has a benefit-cost ratio of 1.4.

A revised cost analysis of Increment II has not been performed, but will be if local assurances are ever provided for the project. In addition, a complete environmental analysis of Increment II will be undertaken and provisions made to compensate for fish and wildlife losses resulting from the Increment II project.

The final environmental statement for Lavon Dam and Reservoir Modification and East Fork Channel Improvement (covering the authorized project) was filed with the President's Council on Environmental Quality (CEQ) on 29 March 1971 and is now considered inadequate by current standards.

An updated environmental statement on the Lavon Dam and Reservoir portion of the project was filed with CEQ on 23 July 1976.

This supplemental statement updates information on the environmental statement relative to the Increment I portion of the East Fork Channel and Levee Improvement part of the authorized project.

SUMMARY

INCREMENT I - CHANNEL AND LEVEE IMPROVEMENT
EAST FORK TRINITY RIVER, KAUFMAN COUNTY, TEXAS

- () Draft Supplement to Environmental Statement
(X) Final Supplement to Environmental Statement

Responsible Office: US Army Engineer District, Fort Worth, Texas
Colonel John F. Wall
PO Box 17300
Fort Worth, Texas 76102
Telephone: 817 334-2301

1. Name of Action: (X) Administrative () Legislative

2. Description of Action: Improve channel and utilize excavated material to raise and strengthen associated levees to protect agricultural lands in the lower East Fork watershed from flooding.

3. a. Environmental Impacts: There will be reduced flooding in the flood plain near the improved channel by 50 percent or more. Improved levees will provide protection to the leveed area for floods up to magnitude of a 50-year flood. Channel improvement will reduce water travel time by about one-half hour. Short term degradation of stream water quality is expected. Ground water levels near the stream will be locally lowered. Air quality will be temporarily degraded. Thirty-seven acres of bottomland woodland will be cleared, and associated wildlife will be displaced. The loss of aquatic areas will be somewhat replaced by oxbow cutoffs with higher quality water. No endangered species will be impacted. Vector habitat will be reduced. Agricultural production will be improved. Employment will be temporarily boosted. The economy of the area will be permanently improved. Cultural elements will not be affected.

Change
b. Adverse Impacts: Noise, air, water, and esthetic quality will be adversely affected during construction. Esthetic quality will be more permanently altered, but erosion and sediment control measures will prevent drastic impacts. The loss of 37 acres of woodland will displace associated wildlife. Excavation and related channel work will result in long term or permanent alteration of the existing aquatic habitat.

4. Alternatives: No action, flood plain regulation, flood warning system, flood plain purchase and relocation, reservoirs, channel construction only, levee construction, levee-channel combination.

cost an estimated \$15,031,000. When this amount is added to the \$3,376,000 already invested and from which no return could be expected, the initial economic cost would be \$17,407,000. Agricultural production would be curtailed as long as the area remained regulated for nonflood damage use, thus resulting in a yearly economic loss from agriculture. This loss might be partially offset by other uses, but the economic value of such alternative uses is questionable at this time.

STRUCTURAL ALTERNATIVES

Charge 6.06 Reservoirs. Two major reservoirs presently exist upstream from the combined Increments I and II channel improvement area, Lake Ray Hubbard and Lake Lavon. One of the purposes of the proposed channel improvement project is to eventually allow greater flexibility in the operation of Lake Lavon and thereby provide 50 year level of protection by permitting releases of up to 5,000 cfs which would remain in-channel and cause no inundation related damages to lands adjacent to the channel. Damage free releases at 5,000 cfs would be possible only if the channel of both Increments I and II were improved since Increment II has some channel constrictions that now only pass up to 2,000 cfs without overbank flooding. (The Lavon project has the design capacity to pass up to 359,000 cfs should such an event be necessary.) There is no apparent justification for another upstream impoundment for flood control, as the flood damages are not of sufficient magnitude to warrant consideration of this alternative.

6.07 Channel Construction Only. Construction of a channel throughout Increment I is a practicable alternative to the proposed project of channel and levees, especially since channel construction has been initiated and 10 percent of the channel construction is complete. Such an alternative would call for the construction of a channel along the originally planned right-of-way with the original configuration. The construction of a channel would reduce average annual flood damages within the leveed area by an estimated \$108,600; however, it would forego the added annual benefits of \$128,200 which could be obtained by an expenditure of \$765,000 for levee improvements.

6.08 The ecological impacts of the project would be essentially the same as for the channelized portion of the proposed project. Because the majority of the construction will take place along the channel right-of-way, impacts resulting from air and noise pollution will be more restricted than alternatives involving levee modification.

6.09 Levee Modification. The levee modification alternative only partially fulfills the desired goals of the Increment I project since interior drainage is not improved and hillside drainage behind the levees would continue to cause losses. Under such a system, levees would be strengthened and raised to an average height of 14.6 feet,

November 27, 1978

AD-1
H. G. SMITH
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

Col. John F. Wall, District Engineer
Department of the Army
Corps of Engineers
Fort Worth District
P. O. Box 17300
Fort Worth, Texas 76102

Re: Final Draft of Revised Memorandum of Agreement -- East Fork
of the Trinity River Project

Dear Col. Wall:

Your letter dated November 17, 1978, transmitting copies of the final draft of the proposed revised memorandum of agreement to be entered into between the Corps of Engineers and the two Utility Districts concerned in Increment I portion of the East Fork Project and of the negative easements to be entered into between the Districts and their members was received November 22.

A review of the revised memorandum of agreement indicates that it comports with the arrangements discussed in the November 7 meeting between your personnel and representatives of the U. S. Fish and Wildlife Service and Miss King of this office. The language further meets the standards discussed by Miss King and Ray Losornio in their telephone conversation of November 16. Your cooperation in assisting this office to reassure the U. S. Fish and Wildlife Service regarding protection of the riparian woodlands as a part of this project is appreciated.

Thank you for providing us with a copy of the negative easement form which will be utilized by the Districts in fulfilling their obligations under Part B. of that Memorandum of Agreement.

Sincerely yours,

(Sgd.) Barry K. Barkson

Barry K. Barkson
Acting Regional Solicitor

cc:
Area Manager, USFWS, Austin, Texas
Regional Administrator, Fort Worth District, USFWS, Ft. Worth, Texas
USFWS Area I

DEC 11 1978

MEMORANDUM OF AGREEMENT

Between the

Kaufman County Municipal Utilities District No. 1
and

Kaufman County Levee Improvement District No. 5

and the

United States of America

Statement of Purpose

This Agreement entered into by and between the United States of America (hereinafter called the "Government") represented by the District Engineer, Fort Worth District, Corps of Engineers, and the Kaufman County Municipal Utilities District No. 1 and the Kaufman County Levee Improvement District No. 5 (hereinafter called the "Districts"), established pursuant to the laws of the State of Texas, supercedes Memorandum of Agreement dated 6 June 1978. The agreement is for the protection of riparian woodlands and placing of limitations upon clearing of timber in the areas between the centerline of the East Fork of the Trinity River, as realigned, and the centerline of the mainstem Trinity River, and the exterior of the levees of Kaufman County Municipal Utilities District No. 1, and in the area between the centerline of the East Fork of the Trinity River, as realigned, and the exterior of the levee of Kaufman County Levee Improvement District No. 5, situated on the east bank. The area described contains approximately 2,400 acres of timber and is delineated on Exhibit A, attached hereto and made a part hereof.

A. What the Government Will Do

1. The Government will inventory existing free standing timber in the area between the centerline of the East Fork of the Trinity River, as realigned, and the centerline of the mainstem Trinity River, and the exterior of the levee of Kaufman County Municipal Utilities District No. 1, and the exterior of the east levee of Kaufman County Levee Improvement District No. 5, as delineated on Exhibit A.
2. The Government, in conjunction with the periodic levee inspection, will monitor the agreement area for compliance with the terms of the agreement as it regards clearing of timber.
3. The Government will report any violations of the agreement to the Districts.

B. What the Districts Will Do

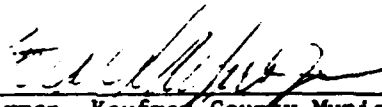
The Districts will set aside the area of forest land under their jurisdiction lying between the centerline of the East Fork of the Trinity River, as realigned, and the centerline of the mainstem Trinity River, and the exterior of the levee of Kaufman County Municipal Utilities District No. 1 and the east levee of Kaufman County Levee Improvement District No. 5, and refrain from the clearing of timber in this area, as delineated on Exhibit A.

C. Further Understandings

1. The agreement is not intended to prohibit the selective cutting of individual trees for noncommercial purposes such as firewood and fence posts, excluding the taking of large mast-producing trees.
2. The agreement is not intended to provide public access to the lands under the jurisdiction of the Districts.
3. Cooperation by the Districts in carrying out the provisions of this Agreement will be subject to the limitations of the laws establishing the Districts.
4. This Memorandum of Agreement will be effective when signed, and will be in effect for the life of the East Fork Channel Improvement project. Review of the terms of the Agreement may be made at any time by mutual consent of the parties hereto, or by either party after 60 days notice of its desire for review.

THE DISTRICTS:

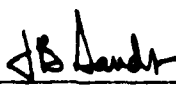
BY:


Chairman, Kaufman County Municipal
Utilities District No. 1

DATE:

Nov. 16, 1978

BY:

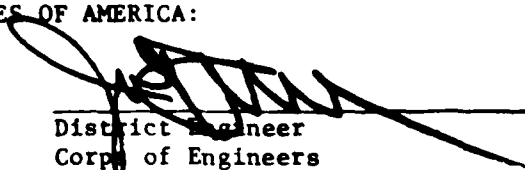

Chairman, Kaufman County Levee
Improvement District No. 5

DATE:

Dec. 14, 1978

THE UNITED STATES OF AMERICA:

BY


District Engineer
Corps of Engineers

DATE:

December 18, 1978

ATTEST: The signing of this Memorandum of Agreement was authorized by a resolution of the Districts' Board of Directors, adopted at a meeting held on 11-22-78.

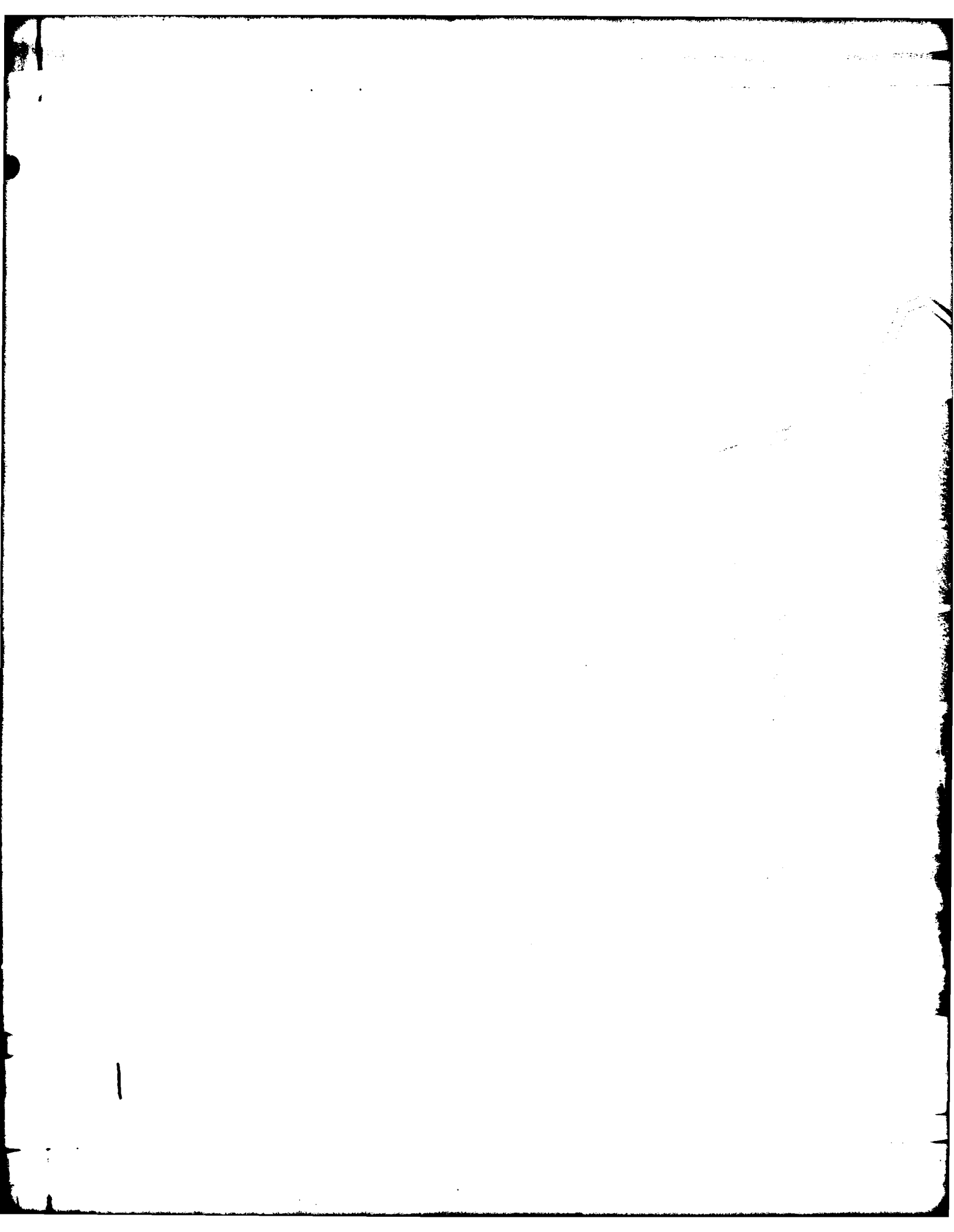
BY: Albert L. Davis
Secretary, Kaufman County Municipal
Utilities District No. 1

DATE: November 22, 1978

ATTEST: The signing of this Memorandum of Agreement was authorized by a resolution of the Districts' Board of Directors, adopted at a meeting held on 11-22-78.

BY: Don W. Gigg
Secretary, Kaufman County Levee
Improvement District No. 5

DATE: December 15, 1978



APPRO
ACRES
REVAL



4

5

EXHIBIT A

APPENDIX C

COPIES OF LETTERS OF ASSURANCES

AGREEMENT BETWEEN
THE UNITED STATES OF AMERICA
AND
KAUFMAN COUNTY LEVEE IMPROVEMENT DISTRICT NO. 5
FOR LOCAL COOPERATION
LAVON LAKE MODIFICATION
EAST FORK CHANNEL IMPROVEMENT
TRINITY RIVER, TEXAS

THIS AGREEMENT entered into this 24th day of July, 1978,
by and between the UNITED STATES OF AMERICA (hereinafter called the "Govern-
ment"), represented by the Contracting Officer executing this agreement, and
Kaufman County Levee Improvement District No. 5 (hereinafter called the
"Levee District"), WITNESSETH THAT:

WHEREAS, the Government has undertaken the Lavon Lake Modification,
East Fork Channel Improvement, Trinity River, Texas Project under authority
of existing legislation, and the Levee District has heretofore on 17 January
1967 adopted a resolution assuring the Government that the Levee District
will furnish without cost to the Government all lands, easements, and rights-
of-way necessary for the construction of the project, agreeing to hold and
save the Government free from damages in connection with the construction
thereof, maintain and operate the project after completion, provide certain
cash contributions, providing full local cooperation required by the Act of
Congress and certain Texas Civil Statutes, and said assurances containing
other provisions; and

WHEREAS, Congress has enacted Public Law 91-646 (84 Stat 1894), 42
U.S.C.A. Section 4601 et seq, known as the Uniform Relocation Assistance
and Real Property Acquisition Policies Act of 1970; and

WHEREAS, the Texas Legislature, by S.B. No. 521, has amended Chapter
45, Acts of the 61st Legislature, regular session, 1969 (formerly Article
6674n-4, but now renumbered as Article 3266b); and

WHEREAS, the said Levee District hereby represents that it has the
authority and capability to furnish the non-Federal cooperation required
by the Federal legislation authorizing the Project, and by other applicable
law; and

WHEREAS, on the 28th day of January, 1972, the Board of Directors of the said Levee District, thereunto duly authorized, passed a Resolution declaring compliance with the provisions of Public Law 91-646 on Federally assisted projects falling within the purview of such Act to be the policy of said Levee District, and authorizing the representatives of the Levee District to do and perform all acts necessary to effect such compliance, in which Resolution the said Board authorized and directed the President and Secretary of the Levee District to do and perform all acts and execute all necessary contracts to implement a program of relocation assistance pursuant to said Act; and

WHEREAS, the Levee District now desires to restate and reaffirm its prior actions and commitments to this project and program by its further agreement and assurances as indicated below.

NOW, THEREFORE, the Parties agree as follows:

The Levee District agrees that if the Government shall re-commence construction of the Lavon Lake Modification, East Fork Channel Improvement, Trinity River, Texas Project substantially in accordance with Federal legislation authorizing the Project, the Flood Control Act approved 23 October 1962 (Public Law 87-874), and the Act of Congress approved 5 October 1971 (Public Law 92-134), and any subsequent enabling and funding legislation, and as outlined in House Document No. 554, 87th Congress, Kaufman County Levee Improvement District No. 5 shall, in consideration thereof, fulfill the requirements of non-Federal cooperation specified in such legislation, and in Sections 210 and 305 of Public Law 91-646.

The said Levee District hereby agrees with and assures the Government that it shall not only:

Furnish without cost to the United States all lands, easements, rights-of-way, and spoil disposal areas necessary for construction of the projects.

Hold and save the United States free from damages due to the construction works.

Bear the expense of relocating and altering highways, highway bridges (except underpinning), utilities, buildings, interior drainage facilities, pipe lines, and other structures (except railroad bridges and approaches.)

Prescribe and enforce regulations satisfactory to the Secretary of the Army to prevent encroachment on the improved channels and floodways.

Maintain and operate all the works after completion in accordance with regulations prescribed by the Secretary of the Army.

Assure that it has the legal and financial ability to meet the above requirements of local cooperatives, in accordance with existing assurances.

But also hereby agrees with and assures the Government that it shall provide the following in accordance with Public Law 91-646:

- (1) fair and reasonable relocation payments and assistance to or for displaced persons, as are required to be provided by a Federal agency under sections 202, 203, and 204 of this title;
- (2) relocation assistance programs offering the services described in section 205 to such displaced persons;
- (3) within a reasonable period of time prior to displacement, decent, safe, and sanitary replacement dwelling will be available to displaced persons in accordance with section 205(c)(3).

And shall further provide that:

- (1) in acquiring real property it will be guided, to the greatest extent practicable under State law, by the land acquisition policies in section 301 and the provisions of section 302, and
- (2) property owners will be paid or reimbursed for necessary expenses as specified in sections 303 and 304.

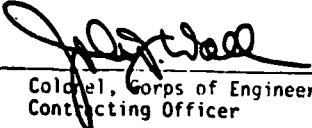
The Kaufman County Levee District No. 5 hereby gives the Government the right to enter upon, at reasonable times and in a reasonable manner, lands which the Levee District owns or controls within the Corps project, for access to said project for the purpose of inspection, and for the purpose of completing, operating, repairing, and maintaining the project if such inspection shows that the said Levee District for any reason is failing to repair and maintain the Project in accordance with the existing assurances, as hereby supplemented, and has persisted in such failure after a reasonable notice in writing by the Government delivered to the said Levee District. No completion, operation, repair and maintenance by the Government in such event shall operate to relieve the said Levee District of responsibility to meet its obligations as set forth in the original assurances, or as herein set forth, or to preclude the Government from pursuing any other remedy at law or equity.

This Agreement is subject to the approval of the Secretary of the Army or his designated representative.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

THE UNITED STATES OF AMERICA

By


Colonel, Corps of Engineers
Contracting Officer

DATE: 26 July 1978

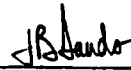
APPROVED:

Secretary of the Army
(or his authorized representative)

DATE: _____

KAUFMAN COUNTY LEVEE IMPROVEMENT
DISTRICT NO. 5

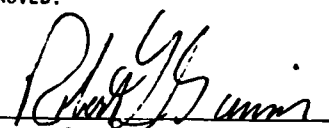
By



President *12*

This Agreement has been reviewed and is approved for legal sufficiency as a binding obligation on the Kaufman County Levee Improvement District No. 5, consistent with Section 221 of Public Law 91-611 (Flood Control Act of 1970).

APPROVED:


Attorney for Kaufman County Levee
Improvement District No. 5

DATE: July 24, 1978

AGREEMENT BETWEEN
THE UNITED STATES OF AMERICA
AND
KAUFMAN COUNTY MUNICIPAL UTILITIES DISTRICT NO. 1
FOR LOCAL COOPERATION
LAVON LAKE MODIFICATION
EAST FORK CHANNEL IMPROVEMENT
TRINITY RIVER, TEXAS

THIS AGREEMENT entered into this 25th day of April, 1978, by and between the UNITED STATES OF AMERICA (hereinafter called the "Government"), represented by the Contracting Officer executing this agreement, and Kaufman County Municipal Utilities District No. 1, formerly known as Kaufman County Levee Improvement District No. 4, (hereinafter called the "Municipal District"), WITNESSETH THAT:

WHEREAS, the Government has undertaken the Lavon Lake Modification, East Fork Channel Improvement, Trinity River, Texas Project under authority of existing legislation, and the Municipal District has heretofore on 17 January 1967 adopted a resolution assuring the Government that the Municipal District will furnish without cost to the Government all lands, easements, and rights-of-way necessary for the construction of the project, agreeing to hold and save the Government free from damages in connection with the construction thereof, maintain and operate the project after completion, provide certain cash contributions, providing full local cooperation required by the Act of Congress and certain Texas Civil Statutes, and said assurances containing other provisions; and

WHEREAS, Congress has enacted Public Law 91-646 (84 Stat 1894), 42 U.S.C.A. Section 4601 et seq, known as the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970; and

WHEREAS, the Texas Legislature, by S.B. No. 521, has amended Chapter 45, Acts of the 61st Legislature, regular session, 1969 (formerly Article 6674n-4, but now renumbered as Article 3266b); and

WHEREAS, the said Municipal District hereby represents that it has the authority and capability to furnish the non-Federal cooperation required by the Federal legislation authorizing the Project, and by other applicable law; and

AD-A087 602

ARMY ENGINEER DISTRICT FORT WORTH TEX

F/G 13/2

ENVIRONMENTAL STATEMENT FOR LAVON DAM AND RESERVOIR MODIFICATIO--ETC(U)
1977

UNCLASSIFIED

NL

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

3 3

END

DATE

FILED

9 80

DTIC

WHEREAS, on the 28th day of January, 1972, the Supervisors of the said Municipal District, thereunto duly authorized, passed a Resolution declaring compliance with the provisions of Public Law 91-646 on Federally assisted projects falling within the purview of such Act to be the policy of said Municipal District, and authorizing the representatives of the Municipal District to do and perform all acts necessary to effect such compliance, in which Resolution the said Board authorized and directed the President and Secretary of the Municipal District to do and perform all acts and execute all necessary contracts to implement a program of relocation assistance pursuant to said Act; and

WHEREAS, the Municipal District now desires to restate and reaffirm its prior actions and commitments to this project and program by its further agreement and assurances as indicated below.

NOW, THEREFORE, the Parties agree as follows:

The Municipal District agrees that if the Government shall re-commence construction of the Lavon Lake Modification, East Fork Channel Improvement, Trinity River, Texas Project substantially in accordance with Federal legislation authorizing the Project, the Flood Control Act approved 23 October 1962 (Public Law 87-874), and the Act of Congress approved 5 October 1971 (Public Law 92-134), and any subsequent enabling and funding legislation, and as outlined in House Document No. 554, 87th Congress, Kaufman County Municipal Utilities District No. 1 shall, in consideration thereof, fulfill the requirements of non-Federal cooperation specified in such legislation, and in Sections 210 and 305 of Public Law 91-646.

The said Municipal District hereby agrees with and assures the Government that it shall not only:

Furnish without cost to the United States all lands, easements, rights-of-way, and spoil disposal areas necessary for construction of the projects.

Hold and save the United States free from damages due to the construction works.

Bear the expense of relocating and altering highways, highway bridges (except underpinning), utilities, buildings, interior drainage facilities, pipe lines, and other structures (except railroad bridges and approaches.)

Prescribe and enforce regulations satisfactory to the Secretary of the Army to prevent encroachment on the improved channels and floodways.

Maintain and operate all the works after completion in accordance with regulations prescribed by the Secretary of the Army.

Assure that it has the legal and financial ability to meet the above requirements of local cooperatives, in accordance with existing assurances.

But also hereby agrees with and assures the Government that it shall provide the following in accordance with Public Law 91-646:

- (1) fair and reasonable relocation payments and assistance to or for displaced persons, as are required to be provided by a Federal agency under sections 202, 203, and 204 of this title;
- (2) relocation assistance programs offering the services described in section 205 to such displaced persons;
- (3) within a reasonable period of time prior to displacement, decent, safe, and sanitary replacement dwelling will be available to displaced persons in accordance with section 205(c)(3).

And shall further provide that:

- (1) in acquiring real property it will be guided, to the greatest extent practicable under State law, by the land acquisition policies in section 301 and the provisions of section 302, and
- (2) property owners will be paid or reimbursed for necessary expenses as specified in sections 303 and 304.

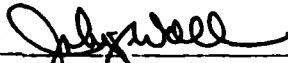
The Kaufman County Municipal Utilities District No. 1 hereby gives the Government the right to enter upon, at reasonable times and in a reasonable manner, lands which the Municipal District owns or controls within the Corps project, for access to said project for the purpose of inspection, and for the purpose of completing, operating, repairing, and maintaining the project if such inspection shows that the said Municipal District for any reason is failing to repair and maintain the Project in accordance with the existing assurances, as hereby supplemented, and has persisted in such failure after a reasonable notice in writing by the Government delivered to the said Municipal District. No completion, operation, repair and maintenance by the Government in such event shall operate to relieve the said Municipal District of responsibility to meet its obligations as set forth in the original assurances, or as herein set forth, or to preclude the Government from pursuing any other remedy at law or equity.

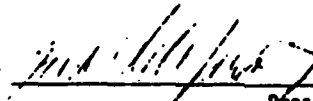
This Agreement is subject to the approval of the Secretary of the Army or his designated representative.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

THE UNITED STATES OF AMERICA

KAUFMAN COUNTY MUNICIPAL UTILITIES
DISTRICT NO. 1

By 
Colonel, Corps of Engineers
Contracting Officer

By 
President

DATE: 4 MAY 1978

This Agreement has been reviewed and is approved for legal sufficiency as a binding obligation on the Kaufman County Municipal Utilities District No. 1, consistent with Section 221 of Public Law 91-611 (Flood Control Act of 1970).

APPROVED:

APPROVED:

Secretary of the Army
(or his authorized representative)


Attorney for Kaufman County Municipal Utilities District No. 1

DATE: _____

DATE: April 25, 1978

APPENDIX D

404 EVALUATION REPORT

Section 404 Evaluation Report
East Fork Increment I
Channel Improvement
East Fork of Trinity River
Kaufman County, Texas

1. Name of Agency. U.S. Army Engineer District, Fort Worth.
2. Applicable Authority. Section 404 of Public Law 92-500, the Federal Water Pollution Control Act Amendments of 1972, as amended.

3. Project Description.

a. Location, Character, and Purpose of Proposed Work. This project is an element of the Lavon Lake Modification and East Fork Channel Improvement, East Fork Trinity River, Texas. This element is a local protection project designed to protect agricultural production in Kaufman County and extends from the mouth of the East Fork to River Mile 10.8. The project provides for the construction of an improved channel with 80-foot bottom width and one vertical on three horizontal side slopes involving 4.5 million cubic yards of material to be excavated. It is located on the East Fork of the Trinity River in Kaufman County about 25 miles southeast of Dallas. The project will provide greater than 50-year flood protection to the interior areas behind the levees.

b. Status of Project. The authorized East Fork channel project comprised the segment from its confluence with the Trinity River, River Mile 0.0, to the mouth of the outlet works discharge channel of Lake Ray Hubbard at River Mile 31.8. During the design stage, non-Federal sponsors in the upper reach of the authorized project notified the Fort Worth District office that they would not be able to provide the necessary local assurances. Therefore, the project was divided into two increments. This report covers only Increment I. A contract for the construction of Increment I was awarded on 14 July 1972. However, inclement weather and prolonged flooding led to termination of the contract on 1 August 1975 at which time the contract was approximately 35 percent complete. The project has been revised to permit the contractor the option to utilize dredging as an alternate method of excavation. The project has been divided into two construction phases. The first phase will provide for construction of the channel and its appurtenances. A soil/sediment quality study conducted on the East Fork concluded that both water and soils sediments are polluted. Therefore, excavated material will be placed behind dikes along the riverside toe of the existing levee to contain leachate during drying. After the material has dried out sufficiently, an anticipated period of 1 to 2 years, the second phase of the construction will be executed using this material to strengthen and raise the existing levees. In the initial construction effort, about 90 percent of the woody vegetative clearing along the existing levees and along the channel rights-of-way was accomplished from the junction of the East Fork with the Trinity River to River Mile 7.0.

c. Federal, State and Local Authorization. The project was authorized by the 1962 Flood Control Act and the Water Resources Development Act of 1974. Local cooperation agreements have been signed between the United States Government and the Kaufman County Levee Improvement District No. 4 (now called Kaufman County Municipal Utilities District No. 1) and Kaufman County Levee Improvement District No. 5. These agreements stipulate that the local agencies will furnish all necessary land, easements, and rights of way for the work, hold the United States free from any damage which may be caused by the work and to maintain and operate the completed work in a manner satisfactory to the Chief of Engineers.

d. Work Subject to Section 404. Completion of the project will involve temporary construction work, excavation and dredging of sediments, and placement of fill material within the ordinary high water mark of the East Fork of the Trinity River, a water of the United States (33 CFR 323, 19 July 1977).

e. Operations and Maintenance. The operation and maintenance of the completed East Fork Increment I Channel Improvement will not be a federal function.

4. Factors Considered in Evaluation. In accordance with Environmental Protection Agency (EPA) guidelines (40 CFR 230, published 5 September 1975), the work has been evaluated for physical, chemical, and biological interactive effects, effects on the water column, and effects on benthos and other aquatic resources. General considerations and objectives for selection of disposal sites and considerations relating to degradation of water uses at proposed disposal sites have also been evaluated and are enumerated below:

a. Water quality. The water quality of the East Fork is currently poor because of the high concentration of waste effluent being discharged into the stream. This condition is worsened during periods of low flow. Sediments within the existing channel are also polluted from long-term discharge of six sewage treatment plants and urban runoff.

(1) Short Term. Completion of the proposed Increment I channelization of the East Fork of the Trinity River will involve short term degradation of surface water quality during construction. The primary effect on water quality during channelization will be related to the disturbance of area soils and sediments. The flood plain contains moderate to high concentrations of heavy metals, specific pesticides, coliforms, nutrients, and oil and grease. Resuspension of sediments and erosion of soils during channelization and levee construction will temporarily add to the total pollutant load of the East Fork. The increased sediment load will increase the total dissolved solids and total suspended solids concentrations and add to the existing oxygen demand caused by wastewater treatment facilities' effluents. Temporary reductions in the dissolved oxygen concentration to near 0.00 mg/l may result during low flow cycles.

Approximately 4.5 million cubic yards of excavated material will be removed during the straightening and channelizing of the present East Fork streambed. Suitable material from channel excavation is planned to be used as fill for rebuilding and strengthening levees, while less desirable excavated materials will be placed behind dikes in low areas within the flood plain and along the river side of levees. Impacts to water quality due to erosion of the poor soil or contamination by excavated material leachate should be minimal. Extensive erosion control measures (turfing, mulching, and smoothing) will be employed to prevent the erosion and sedimentation of these materials, and the quantity of excavated material capable of producing polluted leachate is quite limited as indicated by stream sediment studies.

(2) Long Term. Physical changes due to channelization will include a slight decrease in river flow distance (approximately 10 percent), increased width and depth of the flood control channel, removal of bank vegetation (mainly trees) as well as vegetation within channel right-of-way (90 percent complete), and decreased slope angles of channel banks. The total distance of Increment I work is 9.78 river miles with a total elevation drop of approximately 32 feet.

Adverse impacts to water quality will be limited mainly to periods of flow when water in the improved channel will have a shallow wide profile with an increased surface area and decreased velocity as compared with the existing channel flow characteristics. Increased sedimentation may occur during low flows but will become resuspended during higher flows. Dissolved oxygen levels are projected to remain above the stream standard of 2.0 mg/l during effluent dominated low flows. Adverse impacts to water quality include a slight increase in water temperature during low flow cycles. This increase in the average water temperature during low flow periods will also slightly increase the rate of oxygen depletion due to increased biological activity. Soon after construction, the stream is expected to create a small meandering channel within the improved channel which will contain the "normal" or low flow.

b. Municipal Water Supply Intakes. There are no municipal water supply intakes in the vicinity of the proposed discharge.

c. Shellfish Beds. There are no shellfish beds in the vicinity of the proposed discharge.

d. Fisheries. The existing fishery and other aquatic resources in the East Fork are severely limited due to poor water quality, and are limited generally to rough or nongame species and freshwater organisms capable of surviving low dissolved oxygen levels. About 9 miles of riverbed and associate stream fauna will be affected. A new aquatic ecosystem will develop in the channel over a period of time. Several meanders in the river will be blocked during construction creating oxbow lakes, and therefore creating new aquatic habitat for fish. The same type fish currently found in the East Fork will dominate these oxbow lakes.

e. Wildlife. Wildlife habitat will be adversely affected along 4,000 linear feet of right-of-way remaining uncleared, or about 37 acres of bottomland woodland. Wildlife species existing here will be displaced and eventually lost. A new grassland habitat which will develop adjacent to the improved channel will provide marginal habitat for some wildlife. About 6 miles of riparian habitat will also be eliminated by channel construction.

f. Recreation. Construction of the project will have no appreciable effect on area recreation. As all land is privately owned and generally restricted from public use, recreation will remain at current low level use. Construction activities will temporarily affect bank fishing at the County Road 3039 crossing; however, these impacts will be minimal and temporary.

g. Threatened or Endangered Species. The proposed project is not expected to adversely impact any listed threatened or endangered species, or the critical habitat of such species.

h. Benthic Life. The project will generally eliminate stream benthic life in channelized portions of the East Fork for a period of time. The existing benthic ecosystem consists of organisms capable of tolerating low dissolved oxygen and polluted conditions, and it is expected that these organisms will repopulate the channelized streambed.

i. Wetlands. Much of the project area is low-lying, flat, and subject to inundation by flooding, with bars, marshes and sloughs evident in a number of areas. In addition, about 3,000 acres of seasonally flooded bottomland woodland is found in the project area. True wetlands areas occur on small shallow impoundments and sloughs near the existing channel, particularly in the vicinity of County Road 3039. The project will result in elimination of a minimum of 37 acres of seasonally flooded woodland, with the remaining woodland being protected under terms of a memorandum of agreement. It can be expected that the increased gradient, improved drainage, and reduced flooding frequency will alter or eliminate most of the existing marshes and sloughs along the East Fork. This will be partially mitigated by creation of oxbow lakes on meander cutoffs.

j. Submersed Vegetation. The project will not affect any submersed grassflats or other areas containing aquatic vegetation of significant biological productivity.

k. Size of Disposal Site. The project is sized for the smallest practicable area to meet its purposes and objectives.

5. Coordination with Others.

a. Public Notice and Public Hearing. On 6 May 1976 the District Engineer issued a public notice relating to Section 404 concerns for the East Fork Increment I project. In response to this notice, the Texas Parks and Wildlife Department, The Texas Committee on Natural Resources,

and Save Open Space requested a public hearing. This hearing was conducted by the District Engineer on 23 February 1977 in Kaufman, Texas. In the proceedings of the meeting, the District Engineer stated that, in addition to the remarks made at the meeting, written comments would be accepted for the record if they were postmarked by 7 March 1977. Twenty statements were made at the hearing -- 15 in favor of the project and three in opposition. One speaker requested conditional easements and one speaker requested that the project be deferred and integrated into the overall Trinity River development. Subsequent to the meeting four letters were received for inclusion in the record - one in favor and three in opposition.

b. Summary of Objections to the Proposed Action. A digest of the five statements at the meeting and the three subsequent letters that did not concur in the project follows:

(1) Statement from Mr. Daniel W. Lay, Texas Parks and Wildlife Department. The Department views the plan as having an adverse impact on the fish and wildlife resources. The Department recommended consideration of reregulation of flood releases from Lake Lavon, rectification of existing levees to prevent over dumping from floodwaters and operation pumps to remove any ponded water beyond the levees.

Response. The impact of the project on fish and wildlife resources is addressed in the supplemental environmental impact statement. Reregulation of flood releases from Lake Lavon is not feasible particularly in view of the fact that the downstream Lake Ray Hubbard has no flood control storage. Rectification of existing levees and operation pumps to remove ponded waters was investigated and found to be economically infeasible.

(2) Statement from Mrs. Catherine Perrine, Save Open Space. The organization objects to the clearing aspects of the channel, the lack of an adequate environmental impact statement, the deteriorating water quality of the stream and a probable decline in water table.

Response. Clearing that has been performed in initial phases of construction cannot be recovered. Arrangements have been made with local sponsors to preserve remaining timber in the project area by means of a memorandum of agreement for a timber easement on lands between the levees. A supplemental environmental impact statement has been prepared. Existing water quality in the East Fork is poor with low values of dissolved oxygen and higher values of other chemical parameters tending to occur during periods of low flow when sewage effluent represents major flow input. Water quality is addressed in the supplemental environmental impact statement. Construction of the channel improvement project would initially result in localized decline in the water table. The degree of decline would be minimal and the water table level will fluctuate commensurately with the water level in the channel.

(3) Statement from Mr. Edward C. Fritz, Texas Committee on Natural Resources. The committee is opposed to any further progress on channelization. The committee questioned the propriety of claiming benefits for the opening of new agricultural lands. The committee also argued for the preservation of the wetlands and hardwood forests in the project area. It recommended a flood plain management program and the coordination of releases from the Corps' four north Texas lakes. The committee also requested information on the number of landowners to be benefited by the project, and stated the environmental statement was inadequate.

Response. The opening of new agricultural lands is an enhancement secondary benefit and was not evaluated for benefits in the economic analysis of the project. Preservation of the woodlands has been arranged in an agreement with the local sponsors. Creation of oxbow lakes by the project is considered to be aquatic habitat improvement. Flood plain management would remove 13,886 acres from agricultural production; while this loss might be partially offset by other uses, the economic values of these uses is questionable. Number of landowners to be benefited by the project is about 50. A supplemental statement has been prepared.

(4) Statement from Mr. Charles Baxter, U.S. Fish and Wildlife Service. The Service recommended that easements be granted against clearing all remaining bottom land forest.

Response. Agreement on timber maintenance has been made with non-Federal sponsors providing easements in the project area.

(5) Statement from Mrs. Julia Bergen. Mrs. Bergen contended that the project is a piecemeal action in the overall Trinity basin development plan. She recommended that the project be shelved and integrated into the whole replanning for the Trinity.

Response. The project was authorized in 1962 and has been included in the Trinity basin plan that was authorized in 1965. The ongoing restudy of the Trinity considered the completed East Fork project as an antecedent condition. East Fork Channel is a local protection project that has been authorized and funded for construction.

(6) Letter from Mr. Howard Saxion, Sierra Club. The Sierra Club charged that the Corps failed to adequately discuss the environmental impact of the proposed project. The Sierra Club requested that an environmental impact statement be developed so that all alternatives and environmental impacts be adequately discussed. Mr. Saxion specifically noted the lack of consideration of such items as the effects of the project on downstream flooding, siltation, reduction of water quality, destruction of bottomland hardwoods, and riparian wildlife habitat and loss of nutrients in the flood plain. He also charged a failure to consider the net energy loss during the construction period and subsequent periodic maintenance of levees and channel and to adequately discuss alternatives to the proposed action.

Response. The supplemental environmental impact statement has been prepared and all items of concern expressed by Mr. Saxion have been addressed.

(7) Letter from Mrs. Betty Anderson, League of Women Voters of Texas. The League urged the delay of any further channel improvement on the East Fork until the restudy of the Trinity project is completed. The league also urged the reconsideration and update of the environmental impact statement.

Response. The East Fork Channel Improvement is separately authorized and funded by Congress. A supplemental environmental statement has been prepared.

(8) Letter from Mr. Tom Wilbanks. Mr. Wilbanks expressed concern that the purchase of the flood plain had not been considered and that the channelization would degrade water quality, cause erosion and siltation.

Response. Flood plain management and purchase have been considered. However, flood plain management within the existing levees offers no viable improvement in either flood control or environmental features. Flood plain management behind the existing levees would result in the loss of prime agricultural lands that are currently afforded some, although low, degree of protection. The existing poor water quality of the East Fork may be improved by the project and measures to control erosion and siltation have been incorporated in the design of the project to preclude sloughing effects of the project.

c. Views of State and Local Authorities.

(1) The Texas Parks and Wildlife Department views the plan as having an adverse impact on fish and wildlife resources.

(2) Kaufman County Municipal Utility District No. 1 and Kaufman County Levee Improvement District No. 5 signed formal agreements on 28 January 1972 with the Federal Government to provide the items of local assurances required for the project. These districts have furnished all necessary construction easements and have completed all necessary alterations to existing bridges.

(3) The city of Dallas Public Utilities Director cited the need for flood protection in the area and noted that Lake Ray Hubbard had no provisions for flood control.

d. Environmental Statement. A final environmental statement for the Lavon Lake Modification and East Fork Channel Improvement was filed with the Council on Environmental Quality (CEQ) on 29 March 1971. A draft supplemental environmental statement covering overall project impacts on conservation, fish and wildlife values, water quality, aesthetics, ecology (general environmental concerns), historic and prehistoric values, economics, land

use, flood damage prevention, navigation, recreation, water supply, and, in general, the needs and welfare of the people was filed with EPA on 24 February 1978. The evaluation factors enumerated above under EPA guidelines (40 CFR 230) for disposal of dredged or fill material in navigable water are also considered in the environmental statement. This statement was coordinated with Federal, State, and local agencies for review and comment on various environmental aspects of the proposed project. Interested citizens and organizations were afforded the opportunity to review and comment on the supplemental environmental statement. A final supplemental environmental statement was prepared incorporating comments received in coordination or responding to issues raised.

6. Conclusion. Pursuant to Section 404(b) of the Federal Water Pollution Control Act Amendments of 1972, as amended, and EPA guidelines for evaluating proposed discharge of dredged or fill material in waters of the United States, it was determined that disposal of dredged or fill materials to be used in construction of the East Fork Channel Improvement Project will not result in serious water quality problems. However, the overall project will result in permanent loss of wetlands areas from channelization, reduction in flooding frequency, and lowered channel gradient. The public and interested Federal, State, and local agencies have had an opportunity to express themselves, and all reasonable efforts have been made to mitigate loss of wetlands and resolve wetlands concerns. The proposed activity, to serve project purposes, is dependent upon being located in a wetlands area. It was further determined that:

a. Feasible alternatives to the proposed discharge have been considered and none that are practicable will have less adverse impact on the aquatic and semi-aquatic ecosystem.

b. There are no unacceptable environmental impacts on the aquatic and semi-aquatic ecosystem as a result of the discharge.

c. The discharge of the dredged or fill material will be accomplished under conditions which will minimize, to the extent practicable, adverse environmental effects on the aquatic and semi-aquatic ecosystem. Therefore, the discharge sites for the East Fork Channel Improvement Project can be specified through the application of the Section 404(b) guidelines.

