

## CHAPTER 1 INTRODUCTION

This volume of the Lower Colorado River Basin, Phase I, Texas, Interim Feasibility Study and Integrated Environmental Assessment documents the feasibility studies undertaken to determine a recommended plan for addressing water resource related problems and needs in the vicinity of Wharton, Texas.

### STUDY AUTHORITY

Authorities for conducting studies within the Colorado River Basin of Texas have been in place since the mid-1930's. Despite being somewhat aged, they have remained active throughout the years, and remain valid today for studies in or near Wharton, Texas. The applicable Congressional Study Authorization is shown below:

Resolution by the Committee on Commerce, United States Senate, adopted August 4, 1936:

*“Resolved by the Committee on Commerce of the United States Senate, That the board of Engineers for Rivers and Harbors created under Section 3 of the River and Harbor Act, approved June 13, 1902, be and is hereby, requested to review the reports on Colorado River, Texas, submitted in House Document Number 361, Seventy-first Congress, second session, and previous reports, with a view to determining if improvement in the interest of commerce and flood control is advisable at the present time.”*

River and Harbor Act, approved August 26, 1937:

*“Section 4. The Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys to be made at the following named localities.....Colorado River, and its tributaries, Texas, with a view to its improvement in the interest of navigation and flood control.”*

River and Harbor Act, approved March 2, 1945:

*“Section 6. The Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys to be made at the following named localities.....Colorado River, Texas.”*

## **STUDY PURPOSE**

The primary purpose of the Wharton Interim Feasibility Study (WIFS) is to investigate the water-resource problems, needs, and opportunities within the City of Wharton, Texas and associated Colorado River and San Bernard River Watersheds. Efforts during Phase I of the study focused on evaluating the existing conditions, identification of problems and needs, and identifying preliminary alternative measures to minimize existing and future flood losses. The WIFS also evaluated preliminary alternative measures and study areas for possible protection and restoration of ecosystem integrity.

Phase I of the study specifically evaluated historical and recent flooding caused by localized storm events, Colorado River flood events, and overflow and backwater impacts from the Colorado River on Caney Creek, Baughman Slough, and Peach Creek. Since Baughman Slough and Peach Creek are in close proximity to the City of Wharton and are influenced by overflow from the Colorado River, these tributaries of the San Bernard River Watershed were also included in the WIFS. These areas of interest will be thoroughly described in the Existing Conditions section of the report.

## **STUDY PARTICIPANTS AND COORDINATION**

The WIFS is being conducted by the U.S. Army Corps of Engineers (Corps), in cooperation with the Lower Colorado River Authority (LCRA) as the official non-Federal sponsor. In addition, an Interlocal agreement exists between the LCRA and the City of Wharton, who is the primary local proponent. A major project supporter is the Texas Water Development Board (TWDB). The TWDB has provided financial support to the non-Federal sponsor in the amount of 50% of the local sponsor's required contribution for the feasibility study efforts. This allowed the LCRA and the City to participate in the study without it being such a financial burden. This partnership with the TWDB and the local sponsor has extremely valuable.

Additionally, there has been coordination with the U.S. Fish and Wildlife Service (USFWS), the Texas State Historic Preservation Officer (SHPO), Texas Parks and Wildlife Department (TPWD), and numerous other State and local agencies.

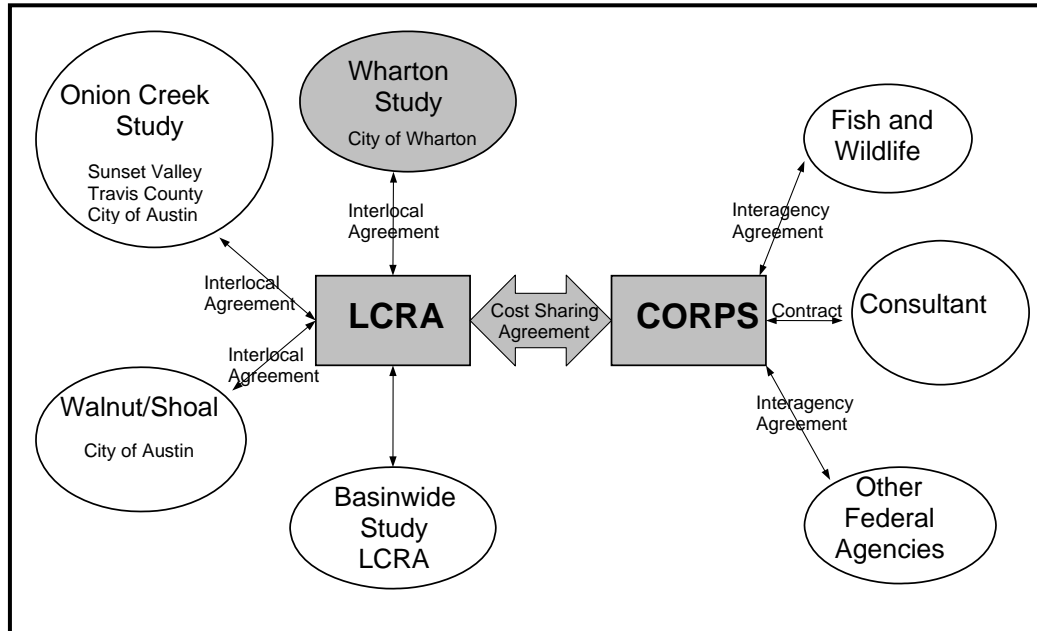
The USFWS was an active participant, and accompanied Corps environmental personnel on numerous site visits to the study area. While no major resources were specifically identified, it was noted that the Peach Creek corridor has remained relatively undisturbed, and any alternatives directly impacting the banks of Peach Creek would require special attention.

The WIFS is one of several interim studies being conducted as part of an overall Lower Colorado River Basinwide Initiative. Similar interim studies are also underway for Onion Creek, Lake Austin, and the entire Lower Colorado River Basin.

Figure 1-1 graphically depicts the entire study structure. The LCRA, the official non-Federal sponsor for Lower Colorado Basinwide Studies, has entered into a 50/50 cost sharing agreement with the Corps. The LCRA, in turn, has entered into numerous interlocal agreements. For purposes of Phase I of the WIFS, the City of Wharton provided cash and/or in-kind services, with LCRA acting as the focal point for all activities.

Throughout the course of this study, public workshops and Wharton City Council briefings have been conducted in order to keep City officials and interested citizens abreast of the study progress. Input from the public has been solicited at each meeting. In addition, an internet web site, <http://www.fdep.org>, was established to easily share information to the public for all the Lower Colorado River Basin studies.

**Figure 1-1  
Lower Colorado River Basin Study Structure**



**STUDY AREA AND SCOPE**

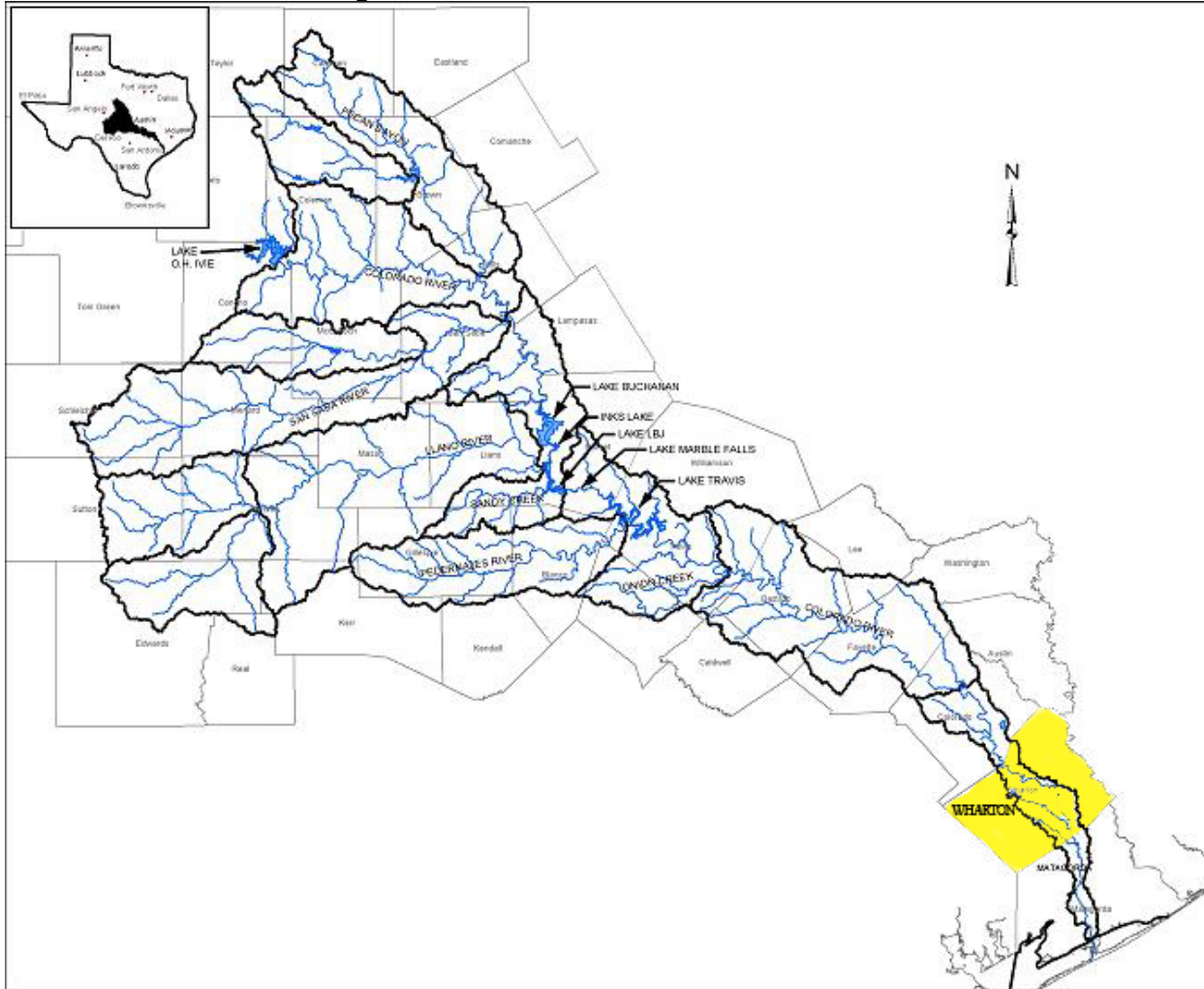
The proposed study area is located within Wharton County, Texas including the City of Wharton. Wharton County is bounded by Colorado County, Austin County, Fort Bend County, Brazoria County, Matagorda County, and Jackson County. It encompasses an area of 1,095 square miles. The City of Wharton is the county seat, located near the center of Wharton County. The City of Wharton lies approximately 55 miles southwest of Houston, 142 miles from Austin, 173 miles from San Antonio, and 200 miles from Corpus Christi and is bounded by U.S. Highway 59 to the west and the Colorado River to the south. The geographic relationship between Wharton County, which contains the study area for WIFS, and the rest of the Lower Colorado River basin, is depicted in Figure 1-2.

More specifically the study area is defined as the area within the left bank floodplain of the Colorado River between the community of Glen Flora and the downstream city limits of the City of Wharton. (Figure 1-3). This includes the area subject to overflow from the Colorado River into Caney Creek, Baughman Slough, and Peach Creek. The close proximity of Peach Creek and Baughman Slough, which are in the San Bernard River Watershed, to the Colorado River and Caney Creek make them susceptible to flood event overflows from the Colorado River. Therefore, Baughman Slough and Peach Creek above the confluence with Baughman Slough are included in this study, due to their close proximity to the city of Wharton and the influence of the Colorado River on them during a flood event.

Residences and other various urban structures have been built within the 100-year flood plain of the Colorado River, often experiencing substantial damages during flooding events, sometimes in excess of millions of dollars. Within the city of Wharton there are approximately 1100 structures in the 25-year flood plain, over 1600 in the 50-year flood plain, and more than 2100 in the 100-year flood plain. The areas surrounding the city of Wharton including Glen Flora contain over 200 structures in the 25-year flood plain, over 400 in the 50-year flood plain, and more than 600 in the 100-year flood plain.

**This page intentionally left blank**

Figure 1-2. Lower Colorado River Basin



**This page intentionally left blank.**

**Figure 1-3. Vicinity and Study Area Map for the Wharton Interim Feasibility Study**

Insert 11x17 figure

**This page intentionally left blank.**



In order to understand and address the flooding problems within the City of Wharton, the layout of the city with references to neighborhoods and points of interest are presented in Figure 1-4. The West End Neighborhood (1) has been severely impacted by Colorado River flooding in the past. The neighborhood is bounded by the Colorado River on the south, Farm-to-Market Road (FM) 102 to the north, U.S. Highway 59 to the west, and an abandoned railroad embankment to the east. A major horseshoe shaped bend in the Colorado River (2) further aggravates flooding problems in this low lying area. The straight line distance from Highway 59 through the West End neighborhood to the abandoned railroad is approximately 6,000 feet. However, almost 14,000 feet of Colorado River flows through this same reach.

East of the railroad and Business Highway 59 is downtown Wharton and the Riverside Park area (3). Downstream of downtown (southeast of Wharton) is the wastewater treatment plant (4). An outfall channel to the Colorado River (5) also exists in this area and drains a box culvert under Alabama Road. The inlet to the Alabama Box is a low-lying park area near Santa Fe Street and Alabama Road (6).

Northern Wharton includes the Ahldag subdivision (7). Two channels in the subdivision convey flow to the Alabama/Junior College Road ditch and into Baughman Slough. These channels have overflowed in the past, most often due to local rainfall independent of the Colorado River, and created problems for residents in the Ahldag neighborhood.

A U.S. Geological Service (USGS) gauging station is located in Wharton along the Colorado River (8). The gauge (ID# 08162000) is mounted on the Business Highway 59 Bridge, 1,100 feet downstream of the abandoned railroad. This location corresponds to Colorado River mile 65.0 (Station 343254.8).

**This page intentionally left blank**

Figure 1-4. Map Identifying Neighborhoods and Points of Interest within the City of Wharton, Texas





## **PRIOR STUDIES AND REPORTS**

Numerous water-resource related studies have been completed by various interests in past years, which contain information relating to flooding near the City of Wharton. A list of the most significant reports is shown below:

### **COLORADO RIVER RAFT REMOVAL**

A significant collection of driftwood located near the mouth of the Colorado River grew significantly during the 1800's and early 1900's and came to be known as the "raft". The Texas Legislature passed an act in 1923 to clear the raft and build levees in the hopes of mitigating future flood damages. In 1934 the raft was completely removed into the Gulf of Mexico. The effects of the raft on the streambed elevations in Wharton were addressed in a 1975 study by the Wharton Fresh Water Resources Conservation & Development Commission (WFWRCDC). Inconsistencies in water surface elevations before and after the raft removal in the 1920's and 1930's indicated that the Colorado River channel bed was deepening following the raft removal as silt was carried away and higher velocities prevailed.

### **BAUGHMAN SLOUGH**

In 1970, the Galveston District of the Corps published a report related to the floodplain of the Colorado River and Baughman Slough in Wharton, Texas. The report documented historic floods and the dimensions/elevations of bridges crossing Baughman Slough and the Colorado River in the study area. The study indicated that the Intermediate Regional Flood (100-year) on the Colorado River at Wharton would have a peak discharge of 178,000 cubic feet per second (cfs). This value was based on analysis of historical flows from 1900 to 1968 and flows prior to 1942 were adjusted to simulate the effects of Mansfield Dam. Also included in the study are profiles and inundation surfaces for the Colorado River and Baughman Slough resulting from the Intermediate Regional Flood on the Colorado River.

### **TURK, KEHLE & ASSOCIATES REPORT**

In 1977, Turk, Kehle, & Associates prepared a report for Wharton County reviewing the 1970 Corps Baughman Slough report. The 1970 report was examined to determine if present (1977) channel conditions were considered and if flood control structures in the Colorado River drainage basin above Wharton were accounted for. The Turk, Kehle, & Associates report stated that the 1970 Corps study did not take into account flood control structures on Cummins Creek. As opposed to performing a historical flow analysis along the Colorado River, Turk, Kehle, & Associates centered the 100-year rainfall event on the most critical portion of the watershed, identified as the reach from Austin to Columbus. Using this procedure, a new 100-year flow rate at Wharton was found to be 145,000 cfs, nearly twenty percent less than the 1970 study. This lower flow rate resulted in water levels 1.6 to 2.1 feet lower than the 1970 report.

## **SAN BERNARD RIVER REPORTS**

Although the San Bernard River was not directly a part of this study, issues related to the tailwater effects near the Peach Creek confluence were addressed. In response to this tailwater study, two reports related to the San Bernard River were investigated. The San Bernard River watershed is approximately 130 miles long and covers an area of 1,000 square miles. The San Bernard forms the county boundary between Wharton and Fort Bend Counties. The first report studied was a 1971 Corps Survey Report on the San Bernard River, Texas. The purpose of the report was to investigate flood control and major drainage improvements along the San Bernard River in Wharton County. A general description of the watershed was presented in this report, as well as proposed improvement alternatives. The conclusion of the study was that no improvements were economically justified at that time.

The second report, Reconnaissance Report, San Bernard River Watershed, Texas, was published in 1991. The report provides the results of a reconnaissance-level investigation of the feasibility of reducing flood damages in the San Bernard River watershed. The primary objective of the investigation was to determine if economically feasible measures exist to provide comprehensive flood control. The report did state that during flooding, the waters along the San Bernard River recede slowly because of dense vegetation, brush, and trees. The 1991 report also noted a 1989 study by VanSickle, Michelson, & Klein, Inc., San Bernard Drainage Analysis Channel Clearing Project. According to the 1991 reconnaissance report, the 1989 study identifies reaches of the San Bernard where clearing would reduce the elevation and duration of the flood flow.

## **WHARTON COUNTY FLOOD INSURANCE STUDY**

The current effective Wharton County, Texas, Flood Insurance Study (FIS) was published in November 2001. Revisions published in the 2001 FIS did not update the hydrology and hydraulics of the Colorado River, Baughman Slough, and Caney Creek that were completed in 1982. At the request of the Federal Insurance Administration (FIA) in 1978, the Southwest Division of the Corps reviewed the 1970 report related to frequency discharges along the Colorado River in Wharton. A period-of-record analysis from 1930 to 1974 was executed as part of this study. This analysis resulted in a 100-year average daily Colorado River flow rate at Wharton, Texas, of 143,000 cfs. Ten percent was added to this flow (14,300) to account for instantaneous peak and another 5,000 cfs was added to account for Mansfield Dam (Lake Travis) releases. The 100-year peak flow rate for the Wharton gauge of the Colorado River prior to any overflow escape was adopted as 162,000 cfs for the 1981 FIS work performed by Turner, Collie, and Braden. However, much of this flow was found to overflow into Caney Creek, Baughman Slough, and Peach Creek upstream of the City of Wharton. These overflows were taken into account and the published 100-year peak flow rate along the Colorado River at Business Highway 59 in Wharton, Texas, is 139,500 cfs in the 2001 FIS.

## **WHARTON COUNTRY FIS/MAPPING UPDATE**

The Wharton County FIS and floodplain maps were updated in 2005, and will become effective in January 2006. The Federal Emergency Management Agency (FEMA) approved the modeling and mapping of the Colorado River, Baughman Slough, Peach Creek, and Caney Creek. The modeling performed for this update is similar to the modeling performed for the WIFS existing conditions.

## **LOWER COLORADO RIVER BASINWIDE FLOOD DAMAGE EVALUATION PROJECT**

The WIFS refines the Colorado River flows and hydraulic models around the City of Wharton that were developed as part of the Lower Colorado River Basinwide Flood Damage Evaluation Project (FDEP). The FDEP involved detailed period-of-record, hydrologic, hydraulic, and reservoir simulations for over 482 river miles of the Colorado River from near San Saba, Texas, to Matagorda Bay. The watershed of the Colorado River studied during the FDEP encompassed 18,300 square miles. A product of the FDEP was water surface elevations along the Colorado River near Wharton, Texas, for the 2-year through Standard Project Flood (SPF) events. These models included some Colorado River overflow into Caney Creek, Baughman Slough, and Peach Creek, but further refinement was needed to better analyze flooding problems and potential solutions in the City of Wharton.

## **NATIONAL ENVIRONMENTAL POLICY ACT**

The National Environmental Policy Act of 1969 (NEPA), as amended, is the nation's charter for environmental protection. NEPA establishes policy, sets goals, and provides means for carrying out the policy. Section 102 (2) of the act includes a provision to prepare an Environmental Assessment (EA) on the effects of the proposed Federal action. The Federal regulations for implementing the procedural provisions of NEPA were published by the council on Environmental Quality (CEQ) in the Code of Federal Regulations (CFR) as 40 CFR Parts 1500-1508 (43 Federal Register 55978-56007, November 29, 1978).

Corps regulations permit an EA to be a self-sustaining document or an integration of NEPA required discussions in the text of a project planning report. Regarding the environmental nature of the Wharton study area and in the interest of reducing paperwork, costs, and redundancies, the Corps elected to integrate these documents. Sections in this report that include NEPA required discussions are marked with an asterisk in the Table of Contents to assist readers in identifying such material. The document addresses the alternatives investigated and the respective environmental effects to the Wharton study area.

In an additional effort to reduce paperwork, this Interim Feasibility Report and Integrated Environmental Assessment is tiered from the *Final Programmatic Environmental Impact Statement, Flood Damage Reduction and Ecosystem Restoration, Lower Colorado River Basin, Colorado River, Texas August 2005* (PEIS), and is hereby incorporated by reference. The PEIS established existing baseline conditions, future without project conditions and cumulative impacts for the lower Colorado River basin and was prepared so that future projects within the basin could be tiered from it in order to more efficiently incorporate the NEPA process. In addition, the PEIS served as a mechanism to begin early coordination with the resource agencies.

**This page intentionally left blank.**