

# Mapping Activity Statement TA-04

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## **Introduction:**

On May 7, 1999, the Lower Colorado River Authority (LCRA) signed an agreement with the Federal Emergency Management Agency (FEMA) to act as a Cooperating Technical Community (CTC) (now called Cooperating Technical Partner, CTP) on behalf of the communities in the Highland Lakes region and lower Colorado River basin. To date, the LCRA and FEMA have successfully worked together on the following studies:

- TA-01: The DFIRM Pilot Project for Lago Vista, Texas
- TA-02: Map Needs Assessment for the Lower Colorado River Basin
- TA-03: The DFIRM Pilot Project for Meadowlakes, Texas

This mapping activity statement, TA-04, represents the next step under a comprehensive plan to improve the quality of flood insurance maps for the basin. It also introduces a new partner to the project - the Texas Colorado River Floodplain Coalition (TCRFC or Coalition). The Coalition consists of cities and counties in the basin that have entered into a formal agreement to increase the effectiveness of their floodplain management programs through increased coordination and cooperation.

One of the top priorities of the Coalition is to update maps showing the flood plain and floodway for their communities. In addition to entering into an inter-local governmental contract to create the Coalition, the communities have also set up a non-profit corporation to create a single, administrative entity capable of submitting grant applications and entering into agreements on behalf of the Coalition. To date, 30 communities have joined the Coalition.

It is the Coalition's intent to execute a Memorandum of Understanding with FEMA and join the CTP program.

## **Background**

This mapping activity statement, TA-04, is the initial phase of the "Mapping the Lower Colorado River Basin" project described in the Best Practices Mapping Project Proposal submitted to FEMA by the LCRA and the TCRFC on March 1, 2001.

The proposed Best Practices Mapping project entails a massive flood insurance study effort that includes an estimated 505 DFIRM panels that cover approximately 10,500 square miles at an estimated cost of \$10 million. The project area is shown in Figure 1 and includes 11 counties and 48 incorporated areas of the lower Colorado River basin.

The project also includes a creative methodology for maintaining and accessing maps by the local communities. Components of the project include:

- Development of a funding mechanism(s) for the production of maps;

- Production of new base maps within the 11 counties of the lower Colorado River basin;
- Production of approximately 505 new DFIRM panels for areas along the main stem of the lower Colorado River;
- Preparation of a regional Map Maintenance Plan; and
- Implementation of the Map Maintenance Plan.

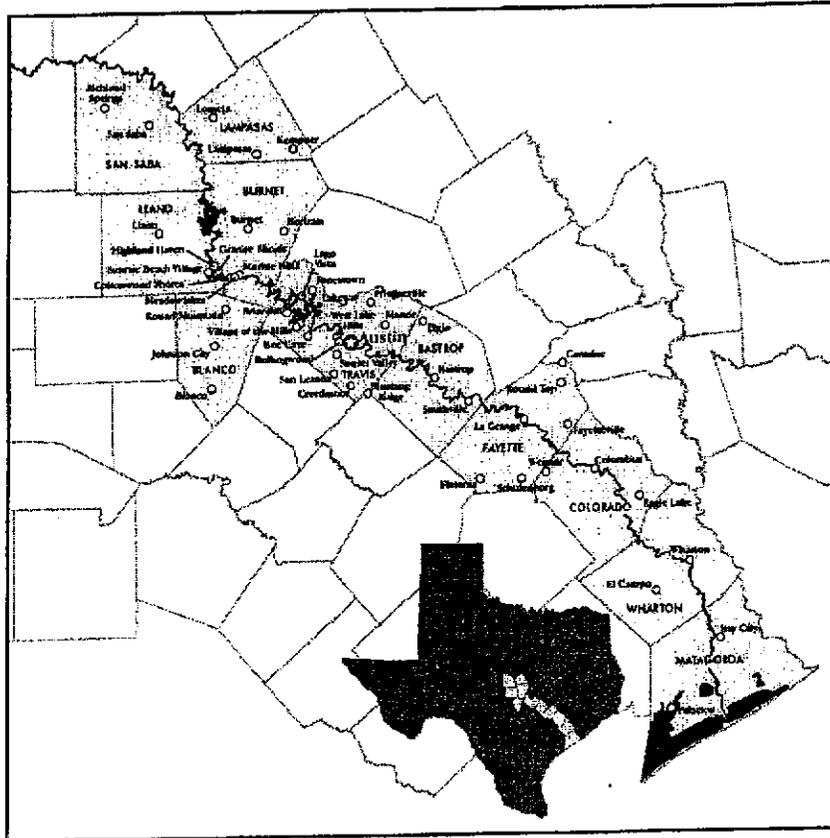


Figure 1 – Study Area for TA-04 Mapping Project .

In accordance with the CTC Memorandum of Agreement, the LCRA and FEMA agree to the following:

# 1. Objectives and Approach

## Objective

The primary objective of this Mapping Activity Statement is to identify, prioritize and produce as many DFIRM products or components as possible within the limitations of available local, state and FEMA funds.

Along with these broad over-arching objectives, FEMA, the LCRA and the TCRFC each have specific objectives that affect the area and approach for producing the new DFIRMs. A brief discussion of these criteria and its impact on the project approach are summarized below.

- The area must be a high priority area for new maps. The LCRA and TCRFC reviewed the existing status of FIRM within the 11-County area and concluded that Wharton and Burnet counties have the greatest need for updated maps.
- The area must be contained within the area covered by the new mapping and H&H models. This is the "River Corridor" area or the area subject to river flooding and included in the flood study being conducted by the LCRA and U.S. Army Corps of Engineers (USACE)
- The area must meet the objectives of FEMA's Map Modernization Program. One of these objectives is the need to produce new DFIRMs on a countywide basis.
- The area mapped must be substantially completed within 18-months.

## Approach

The project approach uses a countywide revision approach for two (2) counties: Wharton County and Bastrop County. In order to complete an entire county, panel production will be a joint effort between the CTP and FEMA: The CTP will complete the county panels in the River Corridor, FEMA will complete the others. The division of work responsibility will depend on the proximity of the panel to the river corridor. A brief summary of this division is presented below.

- Panels within the river corridor. The Mapping Activities to be performed include will preparation of draft DFIRM panels along the River Corridor using new mapping, and new hydrology and hydraulics modeling of the Colorado River basin. The River Corridor is defined as the area covered in the new H&H models for the river: conceptually the River Corridor represents the 500-yr floodplain for the river.

The CTP, in conjunction with the MCC, will panel the county and assign panel production numbers and panel responsibility system for each county. The CTP will prepare those panels within the River Corridor.

- Panels outside of the River Corridor. For the area outside of the River Corridor, FEMA and the MCC will be responsible for preparation of the remaining panels in the county. In this area, no new H&H data is available, so information from existing effective FIRMs will be digitized and converted to FEMA DFIRMs. The production schedule for these "non-corridor" DFIRMs will vary depending on FEMA's funding level. Because the

panel layout had previously been established, introduction of these new conversions can progress without affecting the draft DFIRMs produced in this mapping activity statement.

The next session presents a detail discussion of the work activities associated with the production of the panels within the River Corridor.

## **TA-04 Project Activities**

Utilizing resources developed through earlier CTC mapping activity statements and on-going local projects, the TCRFC and the LCRA have identified the following work activities:

1. Preparation of Work Plan/Project Management
2. Selection of Engineering/Mapping Team
3. Request Additional Mapping Product Funds
4. Preparation of Master Plan
5. Development of Floodways Along Colorado River Corridor
6. Preparation and Submittal of Technical Support Data Notebook
7. Flood Hazard Mapping Products Production
8. Project Meetings and Coordination

Presented below is a description of the work activities envisioned to complete this mapping activity statement.

### **Activity 1: Preparation of Work Plan**

The Coalition's Mapping Committee has prepared the following outline as a draft work plan for the TA-04 project.

This outline will be used in the Request for Proposals for selection of the engineering/mapping consultant. The engineering/mapping consultant will provide details for each work element and will finalize the work plan for TA-04. The LCRA Project Coordinator will implement and monitor the progress of the approved Work Plan. The Work Plan will include the following:

- Charter the project - Establish the working relationship between FEMA, the Coalition, LCRA, the consultant, and other involved agencies.
- Establish Project Criteria - Define the DFIRM specifications and update the specification checklist. Identify specific items/contents required for the proposed work products to be submitted.
- Identify Specific Areas for DFIRM Mapping - Based on availability of new topographic maps, hydrology, and hydraulics, completed by the LCRA or individual communities, identify the specific counties or communities or reaches of the river that can be mapped within the project budget. This will be done in coordination with the Coalition, FEMA, and the MCC.

- Floodway Analyses - Identify reaches where floodway analyses are needed and outline work effort to complete those analyses.
- Panel Tiling - Identify a paneling layout for production of new maps for the selected counties or communities. This will be a collaborative effort with FEMA and the MCC.
- Master Plan (Local Funding Only) - Assess the region's needs and prioritize the TA-04 project, as well as outline a plan for future DFIRM mapping and maintenance.
- Production Plan - Work with the MCC to develop a technical production plan for the selected area(s) and document that plan. This plan will include draft submittals that can be reviewed by Coalition communities and FEMA.
- Project Management - Document the project management aspects of the project, including the mechanisms for Coalition input, consultant communication, invoicing, public review and comment, and product format.

### **Activity 2: Selection of Engineering/Mapping Team**

The LCRA Project Coordinator, working with the TCRFC's Mapping Committee and the Coalition Engineer, will prepare a Request for Proposals (RFP) using the draft work plan described in Activity 1. The request will be coordinated with FEMA Region VI and will be sent to selected engineering and mapping firms who have a history of preparing DFIRMs.

The LCRA Project Coordinator and TCRFC Engineer will verify the qualifications of the firms that submit Proposal and will rank the firms. They will then coordinate with the Mapping Committee to select a qualified engineering and/or mapping firm or team of firms as the consultant to prepare the TA-04 mapping products. The TCRFC Engineer will notify the Coalition's Executive Committee of the selection in writing and receive comments. Following appropriate response to the Executive Committee comments, if any, the Project Coordinator will notify the selected firm. The Project Coordinator will then prepare and execute the contracting agreements.

### **Activity 3: Request Additional Mapping Product Funds**

**(Note: This Activity is fully funded by local, non-federal funds)**

The Coalition is actively seeking State funding (to supplement additional federal funding) needed to produce the DFIRMs. To date the following potential state and local sources and funding schedules have been identified:

- TWDB (Texas Water Development Board) planning grant for 2002 and 2003 fiscal year,
- Legislative appropriation in 2003; local government funding (individual community contributions);
- CAPCO (Capital Area Planning Council), grant monies;
- HAC (Texas Department of Housing and Community Affairs), Building Capacity and Community Assistance grants;
- LCRA Capital Improvement and Project Funds not needed for Master Plan development

## **Activity 4: Preparation of Master Plan**

**(Note: This Activity is fully funded by local, non-federal funds)**

The objective of the Master Plan is to develop a phased production, maintenance and financial plan to convert effective Flood Insurance Rate Maps (FIRMs) and Flood Boundary Floodway Maps (FBFMs) to a digital format. The planning process will be a collaborative effort between FEMA, TCRFC, TNRI, LCRA and others for the 11-county area of the lower Colorado River basin.

The TCRFC has committed to be actively involved in the development of a map production prioritization matrix, which will be used to formulate the panel production schedule. The TCRFC involvement will be advantageous to promoting consensus in the development of a planning document for the 11-county area. A preliminary outline of the Master Plan is presented below.

### **Lower Colorado River Basin DFIRM Master Plan Outline**

- I. Define jurisdiction
- II. Assess needs
  - A. MNUSS database
  - B. Tiling system
  - C. Classify level of need
  - D. Prioritize production (TCRFC Technical Committee input)
- III. Develop a maintenance plan—"Map Master" concept
- IV. Cost estimate
  - A. Unit costs for panel production
  - B. Total cost
- V. Funding options
- VI. Scheduling and implementation

An ongoing weakness in the NFIP is the inability of local, state and federal partners to maintain the accuracy of the published maps. Rapid development and increasing demands for more comprehensive floodplain management amid government budget constraints have resulted in maps that are outdated and difficult to use. The Coalition is attempting to address this weakness by anticipating the implementation of a regional Map Maintenance Plan. The Map Maintenance Plan will provide for the long-term maintenance of the maps produced under TA-04 and future CTP projects so that mapping does not become outdated in the future.

In order to implement the Map Maintenance Plan, the products of TA-04 will need to be archived so that the maps and database(s) are maintained in a public-access format. The Map Maintenance Plan will establish specifications and guidelines for maintaining the new maps through a Map Master concept. It will identify potential partners, potential risks and potential barriers to implementation. The Map Master's primary responsibilities are anticipated to be the following:

- Reviewing map modifications and technical input (LOMC),
- Updating data base and base maps,
- QA/QC of all input and map preparation,
- FEMA/MCC coordination,
- Providing a map repository for access by local communities,

- Maintenance and distribution of Hydrologic and Hydraulic computer models,
- Devising a security system to maintain map and modeling integrity,
- Map distribution, accounting for funding and user assessment.

The initiation of the Map Maintenance Plan through the Map Master concept will be scheduled to occur immediately after completion of the first set of new DFIRMs, subject to funding availability. The engineering/mapping consultant will, as part of the detailed Work Plan, develop the specifications for the archival formatting of the TA-04 work products.

### **Activity 5: Development of Floodways Along Colorado River Corridor**

Utilizing the HEC-RAS unsteady flow models that are being developed in the Colorado River Flood Damage Evaluation Project, prepare FEMA floodways within the counties under consideration.

Floodway processing will involve combining the results of the unsteady analysis with steady-state HEC-RAS floodway computations in an iterative process to determine new floodways and to confirm or revise existing floodways.

### **Activity 6: Preparation and Submittal of Technical Support Data Notebooks**

An essential activity is the development, submittal, review and concurrence, by FEMA's MCC of the basinwide hydrology, hydrologic and mapping information currently under development by the LCRA. This data will form the technical foundation to support any map revisions. We anticipate to deliver these data in the following three subactivities:

**Activity 6.1 – Submittal of Basinwide Hydrology** - Submittal of initial HEC-HMS and supporting historical frequency analysis, period-of-record analysis, and related hydrologic data. This will be submitted to FEMA and the MCC in the format of the standard Technical Support Data Notebook (this initial submittal will be a partial "Master" notebook that focuses on the hydrology of the basin.). This activity will include filling out the FEMA technical notebook hydrology forms, providing documentation of models, notebook preparation, and addressing review comments from the MCC.

**Activity 6.2 – Submittal of Basinwide Hydrologic and Hydraulic Analysis** - Submittal of final hydraulics, which will include HEC-RAS (steady and unsteady models), HEC-5 (reservoir operation model), and the supporting work maps, topographic mapping, cross sections, bridge data, historical high water marks, profiles and floodplain delineation. This submittal will be in the form of a "Master" Technical Support Data Notebook, which will cover the entire Lower Colorado River Basin. It will include the hydrology data from the initial submittal (Activity 6.1). This activity will include filling out the FEMA technical notebook hydraulic forms, providing documentation of models, floodplain work maps, profiles, bridge data, notebook preparation, and addressing review comments from the MCC.

**Activity 6.3 – Submittal of Individual County Technical Support Data Notebooks** - Submittal, on a county-by-county basis, of "mini" Technical Support Data Notebooks, which will cross-reference the "Master" notebook, but will be specific to the county being mapped or "re-studied". This activity will include "breaking out" the specific FEMA technical notebook H&H forms,

floodplain work maps, profiles, bridge data, related mapping data, and addressing review comments from the MCC.

### **Activity 7: Flood Hazard Mapping Product Production**

This is the primary delivery activity for the work. It includes the preparation of approximately 38 draft DFIRM panels along the river corridor in Wharton and Bastrop counties. A preliminary layout of the proposed DFIRM panels is presented in Figures 2 and 3.

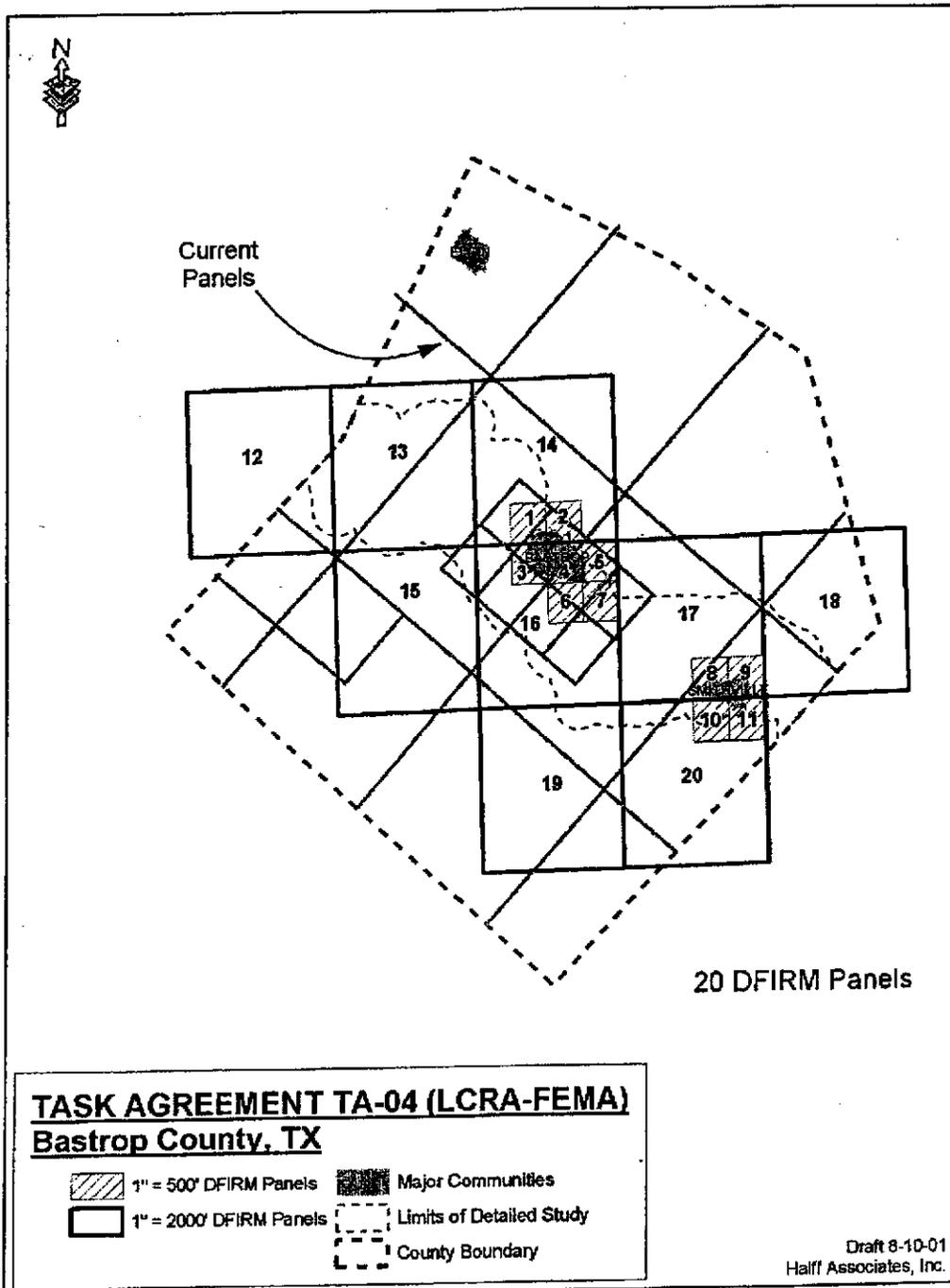
#### The mapping products envisioned include:

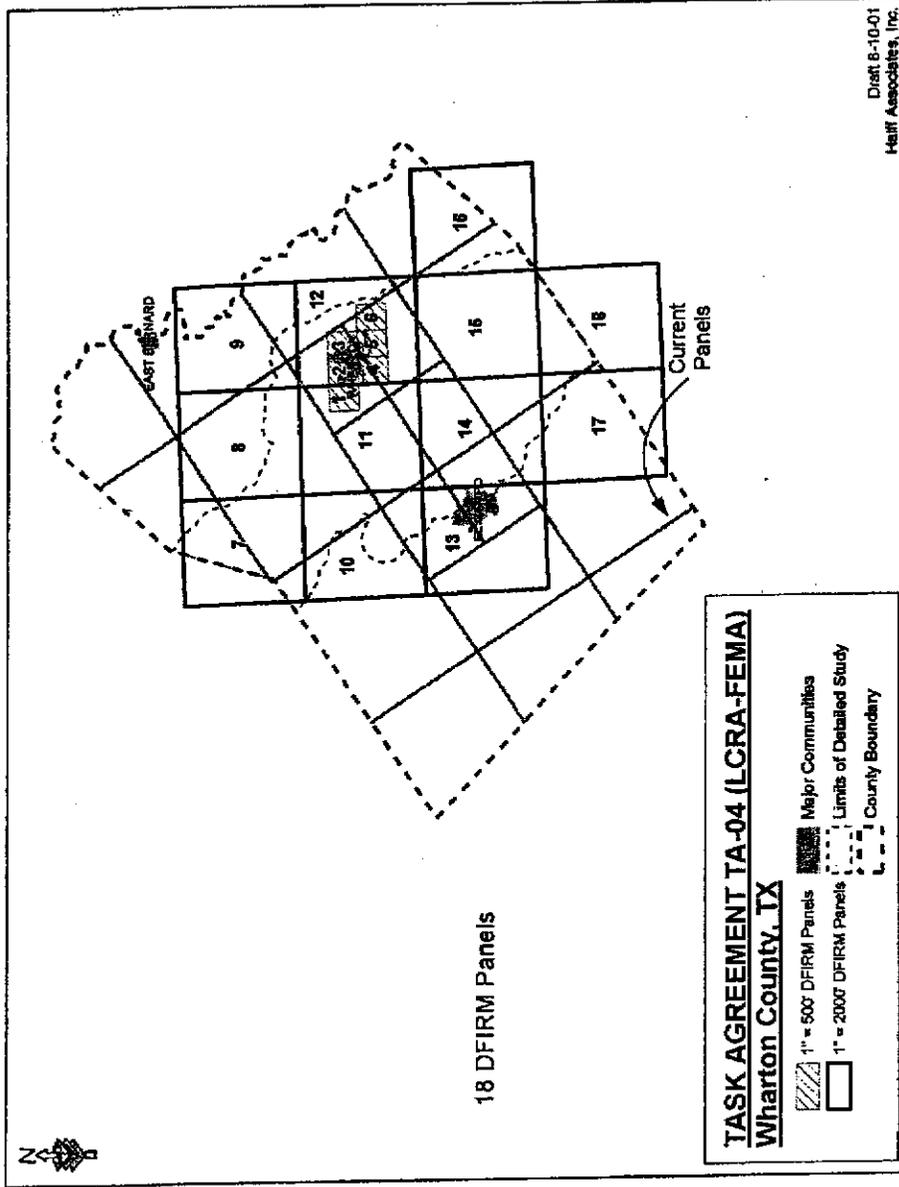
- A Technical Support Data Notebook (TSDN). This is a complete description of the hydrology and hydraulics of the Colorado River corridor. It will be based upon the ongoing H&H studies currently being conducted by the LCRA and USACE.
- Mini-Notebooks for Wharton and Bastrop counties ,
- BFE's for the Colorado River corridor for two (2) Counties - Bastrop County – and Wharton County
- 110 miles of floodways in Wharton and Bastrop County.

#### LCRA/Coalition Responsibilities:

- Provide to FEMA and the MCC the technical data, including the hydrologic and hydraulic data, GIS/digital base maps/floodplain and floodway work maps, profiles, survey data, metadata and other documentation. Technical data would be provided in a FEMA format, "Master" Technical Support Data Notebook, designed to be separated by counties for "Mini" TSDN's for specific county studies (Note: Floodways would be only for counties being mapped in TA-04).
- Preparation of preliminary and draft DFIRMs for FEMA review and approval. Draft DFIRM panels will be prepared to FEMA standards with final printing and distribution by FEMA.
- Coordinate with local communities to define map preferences and limits of political subdivisions.

**Figure 2**  
**Preliminary Panel Layout for Bastrop County River Corridor**





**Figure 3**  
**Preliminary Panel Layout for Wharton County River Corridor**

### FEMA/MCC Responsibilities:

- Review and approve the technical data including the panel layout and scales.
- Review and approve the preliminary and draft DFIRMs for the River Corridor.
- Complete digital conversion of flood hazard information from existing FIRM panels for the area outside of the River Corridor.
- Organize and lead public comment process.

Map products will be developed based upon the USGS quadrangle tiling system, with either 1" = 2,000' (full quadrangle); 1" = 1,000' (Quarter quadrangle); or 1" = 500' (1/16 of Quadrangle) tiles depending upon the level of detail floodplain mapping data and proximity to development. In general, urbanized areas will be mapped at 1"=500' and rural areas mapped at 1"=2000'.

The Texas National Resource Information System (TNRIS) of the Texas Water Development Board has developed the StratMap database, which will be incorporated into the base maps if possible (and if FEMA DFIRM standards are met). Data layers available from the StratMap program include transportation, hydrography, political boundaries, and Digital Elevation Model layers.

Base map and overlays will be enhanced with the new aerial photography and 2-foot contour information from LCRA's recently completed Contour Mapping Project and other recent topographic information supplied by local communities. Production of the mapping products include the following activities:

- **County DFIRM Coordination Meeting.** Introduce project team. Present goals of the study to local officials and present/explain DFIRM process and outcomes to help communities prepare for the activities ahead. Confer with the local flood plain administrator to help identify specific local needs and concerns. Present DFIRM standards document and agree on versions.
- **Develop Aerial/ DOQQ Base Map and Preliminary Panel Layout.** Create a GIS Base Map in accordance with FEMA DFIRM standards. Work with the community to develop correct city limit boundaries. Prepare a layout of the DFIRM panel showing outline and scale.
- **Develop Flood Elevation Coverages.** Intersect new H&H base flood elevations (BFE) data with the new river corridor contour mapping to determine a preliminary flood inundation surface for the area. In the areas where new BFE data is not available, a rectified digitized version (FEMA Q3 data) of the Flood Hazard Area Designation will be utilized.
- **Prepare Preliminary and Draft DFIRM Panels.** Create polygon coverage or coverages showing the extent of inundation and overlay coverage on the digital orthophoto base map. Identify and document errors in the mapped region. Populate panel database and construct DFIRM metadata files. Prepare draft report summarizing the data. Prepare draft DFIRM

panels and associated data CD-ROM. Submit to FEMA and MCC for QA/QC review and draft DFIRM panel production.

- **Review Draft DFIRMs with County and Communities.** Assist FEMA in conducting public meeting(s) to review the DFIRM panels attributes and results. Identify potential problem areas. Prepare meeting summary and distribute to FEMA, county and communities and MCC.

### **Activity 8: Project Meetings and Coordination**

A series of formal project review meetings are planned between the Coalition, FEMA, the engineering/mapping contractor and LCRA. Meetings with individual communities selected for a new DFIRM may also be held as necessary. Meetings may be held via teleconference or in-person. Planned meetings include:

- **Initial Project Coordination Meeting.** The Project Coordinator presents the draft project work plan to FEMA, the MCC and the TCRFC.
- **Project Kick-off with Consultant.** The Project Coordinator presents the selected consultant team and final work plan to the Coalition Executive Committee, the Coalition Mapping Committee and FEMA.
- **Milestone Delivery meeting(s).** When a milestone in the project has been reached, a formal review meeting will be held to present and discuss the delivered information with FEMA. The meeting may include the Coalition Executive Committee, the Coalition Mapping Committee, individual community representatives, and others.

A summary of each meeting will be prepared and distributed by the Project Coordinator.

In addition to the above coordination, individual CCO meetings with the specific counties and communities will also be held.

## **2. Period of Performance**

This Mapping activity statement will cover three years beginning on October 1, 2001 and ending no later than April 2003. This mapping activity statement may be terminated at the option FEMA or LCRA in accordance with the provisos of the CTC Memorandum of Agreement dated May 7, 1999.

## **3. Funding/Cost Sharing**

## 4. Standards

The requirements for DFIRM and FIS preparation will be developed using the standards in effect at the time of execution of this agreement. The following standards and documents are anticipated to apply:

1. *Base Map Specifications for New Digital Flood Insurance Rate Map Product* (FEMA, May 26, 1999) - This supersedes Section 6.6.1 of *Guidelines and Specifications for Flood Map Production Coordination Contractors*
2. *Content Standards for Digital Geospatial Metadata* (Federal Geographic Data Committee, 1998)
3. *Flood Insurance Study Guidelines and Specifications for Study Contractors* (FEMA 37, 1995) and addendums.
4. *Guide for Preparing Technical Support Data Notebook* (FEMA, May 1989, Revised January 1990)
5. *Guidelines and Specifications for Flood Map Production Coordination Contractors* (FEMA, Draft February 17, 1999)
6. *Digital Flood Insurance Rate Map (DFIRM) Graphic Specifications* (FEMA) - Draft. Federal Emergency Management Agency, November 2000 supersedes *Specifications for Preparing Maps and Graphics* (FEMA, Appendix B of *Guidelines and Specifications for Flood Map Production Coordination Contractors, 1999*) in the existing specifications for the depiction of individual
7. Features on FIRM's. Does not supersede handling of different types of map products defined in Appendix B.
8. *Standards for Digital Orthophotos* (U.S. Geological Survey, National Mapping Program, December 1996)
9. *Digital Flood Insurance Rate Map Database Guidelines and Specification*, Draft FEMA, May 15th, (prepared by MCC but not yet signed by FEMA).

## 5. Products

This Mapping Activity Statement includes the delivery of the following work products:

- **DFIRM Map Product(s)** The map(s) will conform to applicable DFIRM standards in effect during this project period. The map product will be suitable for final formatting and printing by FEMA. Anticipated work products include:
  1. A Technical Support Data Notebook (TSDN). This is a complete description of the hydrology and hydraulics of the Colorado River corridor. It will be based upon the ongoing H&H studies currently being conducted by the LCRA and USACE.
  2. Mini-Notebooks for Wharton and Bastrop counties,
  3. BFE's for the Colorado River corridor for two (2) counties - Bastrop County - and Wharton County
  4. Approximately 38 draft DFIRM panels along the Colorado River Corridor in Wharton and Bastrop County.
  5. 110 miles of floodways in Wharton and Bastrop counties.

- **Quarterly Status Report** The report will include the percent complete of the work under this Mapping Activity Statement, major accomplishments, major problems encountered, and the resolution of any major problems encountered.
- **Meeting Summaries.** For each formal meeting, meeting summaries will be prepared and distributed to attendees.

## 6. Schedule and Milestones

### Schedule

The project is planned to be completed within 18-months. A preliminary schedule is presented below. A revised schedule will be developed after the selection the Engineering/Mapping Team (Activity 2).

Figure 4  
Preliminary Project Schedule

Activity	2001			2002					2003						
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1: Proj. Mgmt/Prep Work Plan															
2: Select Engineering/Mapping Team															
3: Funding Requests															
4: Map Master Plan															
5: Dev. Floodways															
6: Prep Tech Support Notebook															
7: Mapping Products Production															
8: Project Meetings/1/4ly Rpts	X			X											

### Milestones

The proposed schedule was developed based upon delivering a steady stream of work products within the 18-months of the agreement. A preliminary schedule of significant milestones is presented below.

October 2001 Contract Executed. LCRA and FEMA sign grant contract

January 2002 Consulting contract executed. Work begins on Master Plan

April 2002 Submittal of Basinwide Initial Technical Support Data Notebooks (Hydrology Only)

October 2002 Final Submittal of H&H Technical Support Data Notebooks to MCC for Review and Approval.

January 2003 Begin quarterly delivery River Corridor draft DFIRM panels with supporting "mini-notebooks".

April 2003 Project closeout.

## 7. Technical Assistance and Resources

Once the communities have been selected for mapping by the Coalition, FEMA will provide the LCRA Project Coordinator with copies of FEMA-issued Letters of Map Change (LOMC), archived engineering backup data, and data developed from the MNUSS database.

General technical and programmatic information can be downloaded from FEMA's Flood Hazard Mapping web site ([www.fema.gov/mit/tsd/](http://www.fema.gov/mit/tsd/)). Specific technical and programmatic support may be provided through FEMA's MCC; such assistance should be requested through the FEMA Project Officer and may include:

- Preparation of a DFIRM panel layout and panel grid in electronic format;
- Example DFIRM mapping and database files;
- Technical assistance in the form of training and technical guidance; and
- DFIRM production tools, software, cell libraries, automated QA/QC tools, etc., that FEMA has developed for its own use.

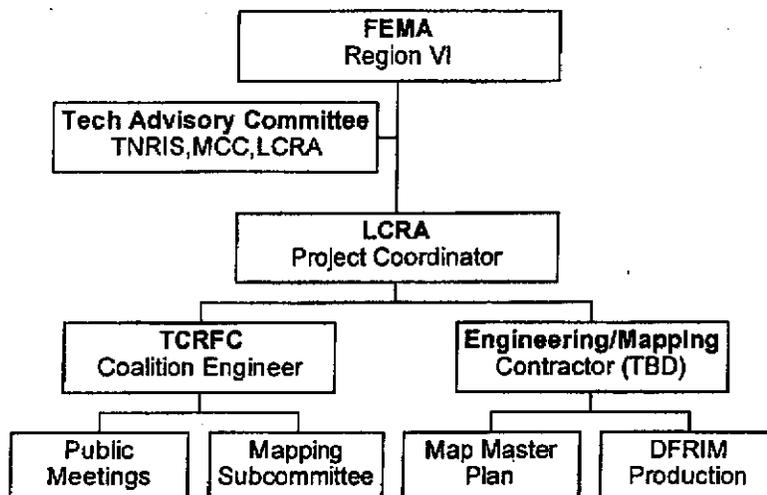
## 8. Contractors

A preliminary project organization chart is presented in Figure 5. The primary contact for the project will be LCRA's Project Coordinator, John McLeod, P.E., with input from the TCRFC Engineer. The LCRA, acting as the administrative agent for the Coalition, will contract all engineering and mapping services for the project. The firms will be selected based on their qualifications and experience with FEMA flood insurance studies and flood plain mapping. A Technical Advisory Committee is planned to provide technical and policy guidance to the project team.

The LCRA will administer the contracts, funding, and work products for the Project. Members of the Coalition and LCRA will also provide in-kind services as necessary to develop mapping products that are mutually beneficial to the local community and to FEMA. This includes, but is not limited to, updated political boundary files, new contour data, and newly modeled hydraulic and hydrologic delineation of inundation surfaces.

Figure 5

**TA-04  
Organization Chart**



## 9. QA/QC Procedures

The primary mechanism for QA/QC will be periodic review of work products by the LCRA Project Coordinator, the Coalition Mapping Committee and its technical advisors, FEMA, and the MCC. The LCRA has demonstrated adherence to FEMA standards on previous CTP projects and will advise the project team regarding all applicable mapping standards. FEMA's MCC will perform the independent QA/QC review.

The QA/QC procedures will vary depending on the activity under review and will include a mixture of manual and automated QA/QC procedures. Quality Assurance procedures will verify that the following objectives are met.

- Data capture of all required DFIRM features.
- Data capture without distortion (other than that resulting from the addition of horizontal control and/ or edgematching).
- Topological fidelity of the DFIRM files. This includes confirmation that the files contain no overshoots or dangles, gaps, node errors, or pseudo nodes, and that all area features are closed.
- FEMA's horizontal and vertical accuracy requirements.
- Resolve all internal edgematching between panels. For example: when there are two adjacent or overlapping communities, the edges between the contiguous communities

must be resolved. This includes both "graphical" mismatches as well as mismatches in engineering data portrayed on the DFIRM (e.g., floodplain width, base flood elevations, etc.)

- Data capture of all required DFIRM database features. In addition, logical data encoding checks should be performed to confirm consistency within the DFIRM database. For example, feature attributes must fall within the specified range and domain for that feature type.
- Hydrology and hydraulic data will be subjected to applicable U. S. Army Corps of Engineers QA/QC procedures. The hydrologic and hydraulic methodologies and modeling from this project and other local projects will be submitted to FEMA and the MCC for QA/QC review and acceptance.

## 10. Reporting

Reporting requirements are described in the Products section of this agreement.

## 11. Points of Contact

The FEMA Project Manager is Jack Quarles, P.E. and the LCRA's Project Coordinator is John McLeod, P.E., or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities.

Each part has caused this mapping activity statement to be executed by its duly authorized representatives.

  
\_\_\_\_\_  
LCRA Authorized Representative  
Wes Bindwell

9/7/01  
\_\_\_\_\_  
date

  
\_\_\_\_\_  
FEMA Authorized Representative  
Jack Quarles

9-13-01  
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