

Technical Memorandum No. 1

TO: Jeff Walker
 Executive Administrator
 P.O. Box 13231
 Austin, TX 78711-3231

DATE: December 16, 2021
Draft due January 7, 2022

THROUGH: Lauren Graber
 Lower Colorado River Authority
 P.O. Box 220
 Austin, TX 78767

PROJECT: LCRA Contract No. 5809
 Halff AVO 43796.001

FROM: Halff Associates, Inc.
 9500 Amberglen Blvd. Bldg. F, Suite 125
 Austin, TX 78759

SUBJECT: **Lower Colorado-Lavaca Regional Flood Plan (Region 10)**
Task 4C – Technical Memorandum No. 1

Process Overview

In 2019, the Texas Legislature enacted Senate Bill 8 directing the creation of the first-ever State Flood Plan to be prepared by the Texas Water Development Board (TWDB) and to follow a similar region-driven “bottom-up” approach that’s been used for water supply planning in Texas for more than 20 years. As outlined by the Texas Water Code, the purpose of the regional and state flood plans is to:

- Provide for orderly preparation for and response to flood conditions to protect against the loss of life and property;
- Guide state and local flood control policy; and
- Contribute to water development, where possible.

Early in the implementation process TWDB established 15 flood planning regions, based on river basin boundaries, and convened Regional Flood Planning Groups (RFPG) for each region. As depicted in Figure 1, draft Regional Flood Plans (RFP) are to be submitted to TWDB by August 1, 2022 and final adopted RFPs by January 10, 2023. The 15 RFPs will then be used to prepare the first Texas Flood Plan for adoption by TWDB by September 1, 2024. Subsequently, the Regional and State Flood Plans will be updated on a five-year cycle.

Figure 1: Regional Flood Planning Timeline

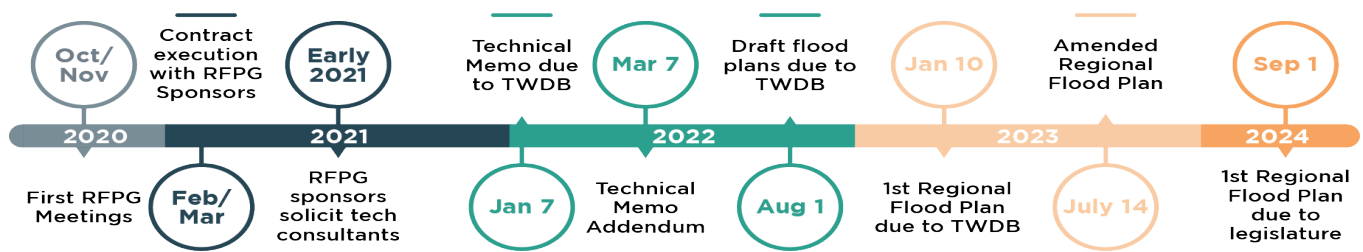


Figure 2 shows the river basin delineations of the 15 flood planning regions, as well as the boundaries (dark green) of the Lower Colorado-Lavaca (Region 10) flood planning region and its 43 counties. This region encompasses the Lower Colorado, Lavaca, and San Bernard River Basins, in the aggregate an area of 24,380 square miles, about the size of West Virginia. Key attributes of the Lower Colorado-Lavaca Flood Planning Region are presented in Figure 3.

Figure 2: Lower Colorado-Lavaca Flood Planning Region

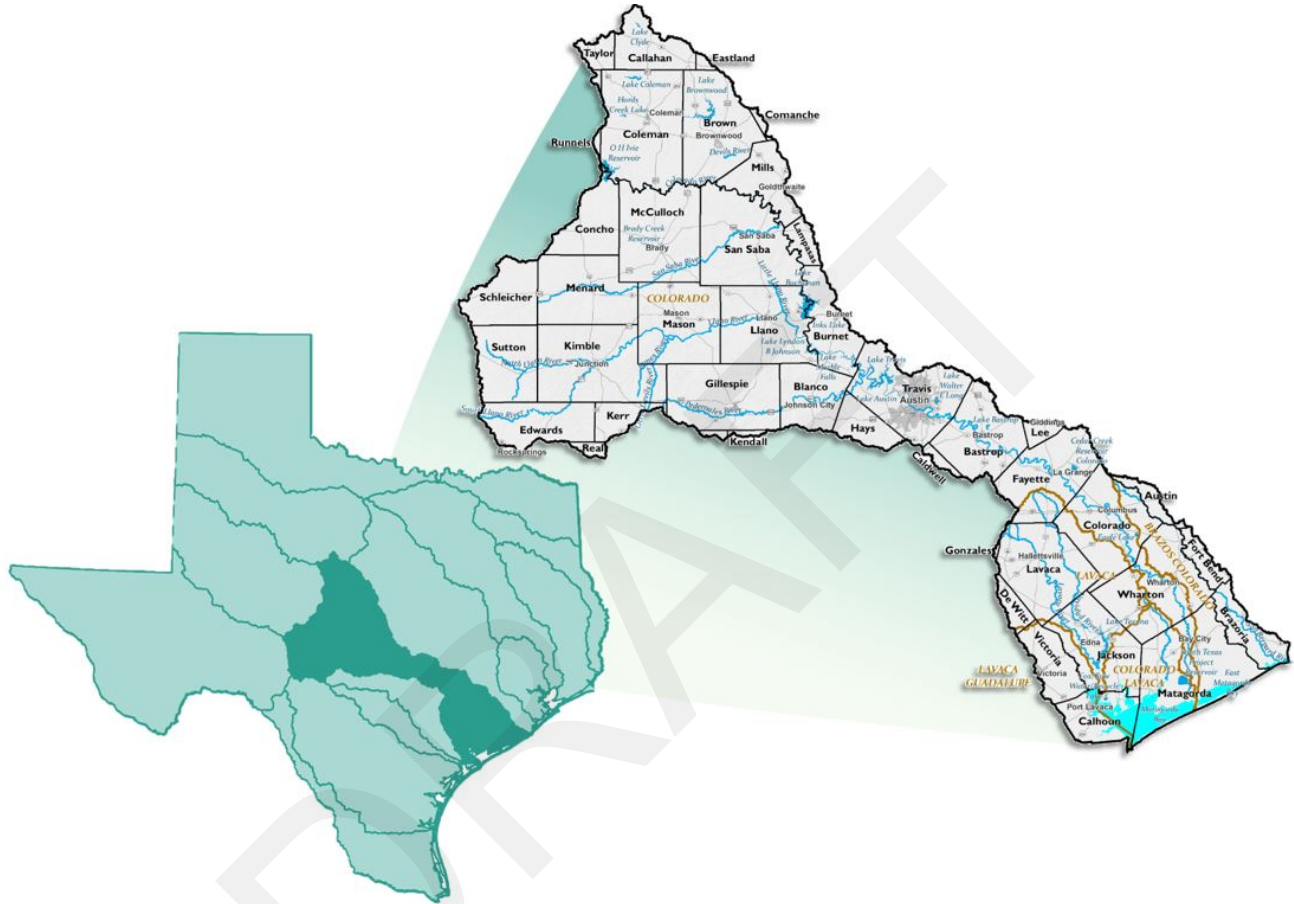
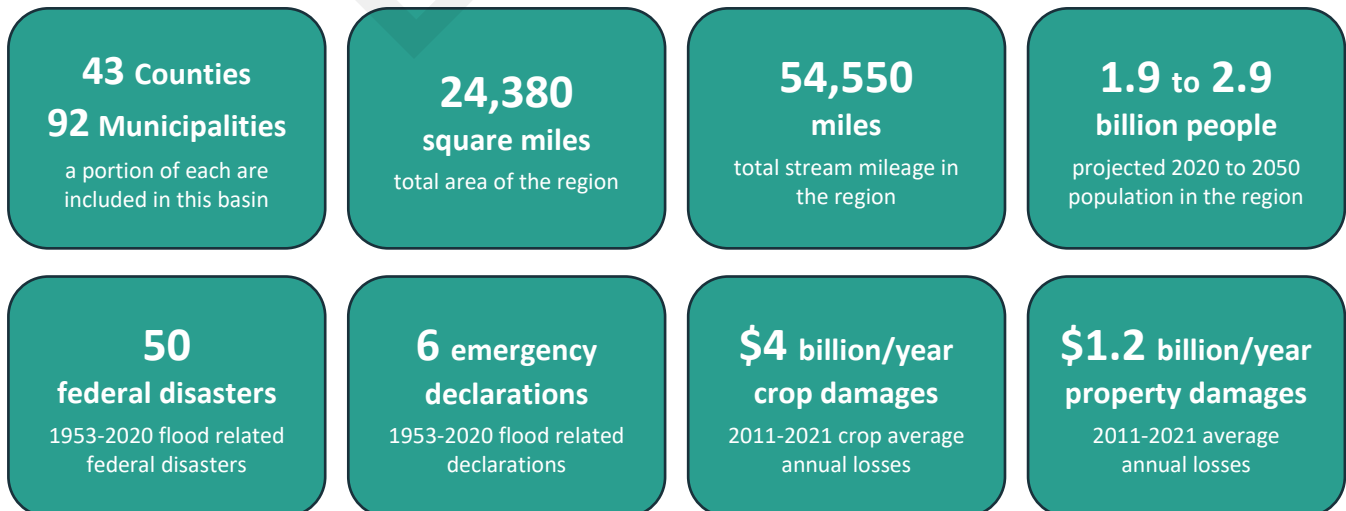


Figure 3: Region 10 Quick Facts



Who is Preparing the Regional Flood Plans?

As noted, TWDB has established RFPGs for each region and has provided funding for preparation of the RFPs. RFPG responsibilities include directing the work of technical consultants, soliciting and considering public input, identifying specific flood risks, and identifying, evaluating, and recommending flood management studies, strategies, and projects to reduce flood risk. To ensure a diversity of perspectives are at the table throughout the planning process, TWDB appointed RFPG members representing 11 stakeholder groups:

- Agriculture
- Counties
- Electric Generation Utilities
- Environmental Interests
- Industry
- Municipalities
- Public
- River Authorities
- Small Businesses
- Water Districts
- Water Utilities

TWDB is administering the regional flood planning process through a contractual relationship with a sponsor selected by the RFPG. The Lower Colorado River Authority (LCRA) was selected as the sponsor for the Lower Colorado-Lavaca region. LCRA’s role as the sponsor is to provide administrative and logistical support for RFPG meetings and required public meetings, to develop and manage the RFPG’s website, and to administer a contract with the project technical consultant. Halff Associates, Inc. was selected by the RFPG as its technical consultant to assist with the preparation of the Lower Colorado-Lavaca Regional Flood Plan.

Regional Flood Planning Tasks

TWDB rules, scope of work, and technical guidelines for regional flood planning prescribes a process consisting of ten tasks as outlined in *Table 1*.

Table 1: Regional Flood Planning Tasks

Task	Description
1	Planning Area Description
2	Existing and Future Condition Flood Risk Analysis
3	Floodplain Management Practices and Flood Mitigation and Floodplain Management Goals
4	Flood Mitigation Needs Analysis and Identification and Evaluation of Potential Flood Management Evaluations (FMEs), Potentially Feasible Flood Management Strategies (FMSs), and Flood Mitigation Projects (FMPs)
5	Recommendation of FMEs and FMSs and Associated FMPs
6	Impacts of Regional Flood Plan and Contributions to and Impacts on Water Supply Development and the State Water Plan
7	Flood Response Information and Activities
8	Administrative, Regulatory, and Legislative Recommendations
9	Flood Infrastructure Financing Analyses
10	Public Participation and Plan Adoption
11	Outreach and Data Collection to Support Tasks 1 – 9
12	Perform Identified Flood Management Evaluations, Identify, Evaluate, and Recommend Additional Flood Mitigation Projects
13	Preparation and Adoption of the Amended Regional Flood Plan

Tasks 1 through 4 comprise the initial discovery or data collection phase of regional flood planning, the conclusion of which is preparation this Technical Memorandum which was approved by the RFPG for submittal to TWDB on December 16, 2021. Per TWDB rules and guidelines, the Technical Memorandum is to be submitted by January 7, 2022, and is to include:

- List of existing political subdivisions with flood-related authority/responsibility;
- List of previous flood studies and models considered relevant for the plan;
- Adopted flood mitigation and floodplain management goals;
- Description of the process to be used to identify potentially feasible FMSs and FMPs;
- List of potential FMEs and potentially feasible FMSs and FMPs;
- List of infeasible FMSs and FMPs with reason of exclusion; and
- Associated geospatial database

To accommodate the delayed release of critical floodplain information, the TWDB extended the deadline for completion and submittal of some elements of the Technical Memorandum to March 7, 2022. These elements, which will be included in Technical Memorandum No. 2, include tables, maps, and geospatial layers for:

- Existing and future condition flood risk;
- Floodplain mapping gaps; and
- Hydrologic and hydraulic model availability.

Status of Flood Planning for the Lower Colorado-Lavaca Region

The following sections provide a summary of the current progress of the regional flood planning process through November 2021. This summary is further supplemented by information included in Attachments to this Technical Memorandum.

Task 10 – Public Outreach and Engagement

The objective of this task is to address public participation, public meetings, administrative and technical support activities that are required to complete and submit a draft and final adopted Regional Flood Plan by January 10, 2023. A summary of public outreach and engagement activities undertaken to date follows:

Regional Flood Planning Group Meetings (2020 – 2021)

LCRA, as the project sponsor, posts all meetings of the RFPG and its Executive Committee on the [Region 10 website](#) and on the Texas Secretary of State website and distributes agendas and meeting materials via email to all voting and non-voting RFPG members, as well as any person or entity who has requested notice of RFPG activities. Registration to receive such notifications is provided via the Region 10 website. All meetings of the RFPG to date have been convened virtually via the Zoom webinar platform or in a hybrid (virtual and in-person) format and are conducted pursuant to the Texas Open Meetings Act (Chapters 551 and 552, Government Code), Public Information Act, and COVID-related disaster proclamations issued by Governor Abbott.

All RFPG meetings must provide at least one opportunity for public comment. Starting in February 2021, the RFPG added a second agenda item for public comment at each meeting. The public now has the option to comment at either the beginning of each meeting or at the end, or both.

Table 2: Meeting Calendar

Year	Date	Meeting	Highlights
2020	November 2	Planning Group Virtual Meeting	RFPG convening hosted by TWDB
	December 7	Planning Group Virtual Meeting	LCRA (sponsor) hosts
2021	February 8	Executive Committee Virtual Meeting	
	February 11 ^A	Planning Group Virtual Meeting	Pre-planning public comment
	March 25	Executive Committee Virtual Meeting	
	March 29 ^A	Planning Group Virtual Meeting	Pre-planning public comment Technical Consultant selected
	April 19 ^A	Planning Group Virtual Meeting	Pre-planning public comment
	May 17	Planning Group Virtual Meeting	First meeting with Technical Consultant
	June 21	Planning Group Virtual Meeting	Technical consultant presentation and discussion of goals and strategies for public outreach and engagement. Review and discussion of requirements for Tasks 1 and 3.
	July 19	Planning Group Virtual Meeting	Technical consultant presentation and discussion of requirements and processes for Task 2, 4 and 5, including overview of types of FMEs, FMS', and FMPs. Initiated RFPG goal-setting process. Review requirements and process for Task 8 and discussion of preliminary list of potential policy issues of interest.
	August 16	Planning Group Virtual Meeting	Present and review preliminary draft of Chapter 1, preliminary draft goal statements, and proposed process for identification, evaluation, and selection of FMEs, FMS', and FMPs.
	October 18 ^B	Planning Group Hybrid Meeting	Public comment taken on draft goals and draft process for identification and evaluation of potential studies and potentially feasible strategies and projects.
	November 15	Planning Group Hybrid Meeting	RFPG approves draft goals and process for identification and evaluation of potential studies and potentially feasible strategies and projects.
	December 16	Planning Group Hybrid Meeting	RFPG approves submittal of Technical Memorandum No. 1. To TWDB on or before January 7, 2022. RFPG establishes subcommittee to assist with the development of recommendations regarding FMEs, FMS" and FMPs.

^APre-Planning Public Input (Feb, March, April) – Public input regarding suggestions and recommendations as to issues, provisions, projects, and strategies that should be considered during the flood planning cycle and/or input on the development of the regional flood plan (as required per Texas Water Code §16.062(d) and 31 Texas Administrative Code §361.12(a)(4)).

^BOctober 18, 2021, meeting initiated a hybrid meeting format with the RFPG Chair and Sponsor organization meeting in a published physical location, open to the public, at LCRA offices in Austin, while continuing to offer the Zoom webinar option for voting members, non-voting members and public participants, in accordance with Texas Government Code §551.127.

Public In-Person Meetings

As noted in the meeting timeline above, three virtual pre-planning public input sessions were conducted during RFPG meetings in early 2021. Depending on status of in-person group gatherings and COVID-19 best practice guidelines, LCRA and the technical consultant will be planning and conducting required public meetings following adoption and submittal of the draft Regional Flood Plan (by August 1, 2022). Depending on the status of the status

of COVID public health considerations, these public meetings could be in-person and held in multiple locations within the region (e.g., upper, middle and lower portions of the flood planning region).

Public Outreach Strategies and Tools

Branding the Region

A visual language, style and color palette was created to provide a consistent look and feel in all public and stakeholder communications and outreach activities. This established a “brand” for the Lower Colorado-Lavaca Flood Planning Region, which helps draw public attention to the planning process. Figure 4 presents the logo developed for the region’s website and communications.

Figure 4: Region 10 Branding



Commitment to Plain Speak

The Region 10 RFPG and technical consultant team have made a commitment to use “Plain Speak” whenever possible and to avoid language and technical jargon that is not readily accessible to the general public. An acronym-decoder and a glossary of flood planning and hydrologic terms are included on the RFPG’s website. There is also a consistent and concerted effort to use more “familiar” terms rather than terms prescribed in TWDB rules and guidelines. For example:

- Flood Management Evaluation (FME) = Study
- Flood Management Project (FMP) = Project
- Flood Management Strategy (FMS) = Strategy

Website: Robust and User-Friendly (www.lowercoloradolavacaflood.org)

LCRA established the required website in January 2021 under the domain name LowerColoradoLavacaFlood.org using the Square Space hosting platform. The technical consultant came on board in May 2021 and immediately undertook branding enhancements and the buildout of the website to provide more information and education materials about flood planning related topics. The website has also been updated to allow easy access for the public and stakeholder to provide input and for review and comment on draft deliverables (e.g., flood mitigation and floodplain management goals). The enhanced website went live in June 2021. Currently, there are several locations on the website where active links can be found for public engagement on the website:

- Subscribe to Notifications (top of Home page, on the Contact Us page, and in the Footer)
- Documents for Public View page
- Stakeholder Survey page for public and community stakeholders
- Submit Comments on Contact page, for written comments prior to or after meetings

As of December 1, 2021, 55 subscribers have registered on the website to receive notifications and information pertaining to the regional planning activities. The table below provides additional website analytics.

Table 3: Website Analytics

Date	Total Visits	Unique Visitors	Page Views
January 1 – December 1, 2021	3,200	2,200	6,900

Direct Email Blasts

The technical consultant introduced the use of Mail Chimp to communicate to public and community stakeholders. An email contact list has been developed for a targeted audience that now has 476 contacts and includes the following tags:

- Municipalities
- Counties
- County Judges
- Floodplain administrators
- Directors of development
- Other Districts
- Subscribers through website
- Chambers of Commerce
- Libraries
- NGOs
- RFPG members
- Half technical consultant team

Thirty email blasts have been sent to audiences between June – December 2021, with a click-to-open average rate of 29 percent. For perspective, a click-to-open average rate between 20-30 percent is generally considered a good response goal.

News Media

With the help of the Texas Press Association and the Texas Association of Broadcasters, the technical consultant has built a media list that includes 110 newspapers and 70 radio stations within the region. To reach all stakeholders through local news media, the technical consultant sends Media Alerts in advance of each RFPG meeting. In July 2021, the consultant provided a 30-second public service announcement (Live DJ read) to all radio stations in the region. This will be revised and repeated in as the regional flood planning process proceeds.

Social Media and Other Media

Facebook has been the primary social media platform used for public outreach within the region, with all meetings posted and promoted, as well as key elements of flood planning in the news media or on the TWDB website. Region 10’s Facebook page can be accessed at: www.facebook.com/LowerColoradoLavacaFlood.

Figure 5: Sample Facebook Post Graphics



Members of the Lower Colorado-Lavaca RFPG and the public indicated early in the process that a digital flier that could be easily printed would be a useful tool. In response the technical consultant developed a flier in both English and Spanish, which are available on the Region 10 website (see Figure 6).

Figure 6: Sample Digital Flyers (English/Spanish)



Task 1 – Planning Area Description

TWDB requirements for Task 1, and the resultant Chapter 1 of the Regional Flood Plan, prescribe collection and presentation of a wide array of data and information about the Lower Colorado-Lavaca region. This required information and associated draft Chapter 1 outline include:

Attributes of the Lower Colorado-Lavaca Region

- Social and economic characteristics
- Flood prone areas and flood risk to life and property
- Key historical flood events
- Political subdivisions with flood-related authority

Assessment of Existing Flood Infrastructure

- Natural features
- Structural flood infrastructure
- Condition and functionality of existing flood infrastructure

Proposed and Ongoing Flood Mitigation Activities

- Current flood mitigation activities
- Projects under construction

The data and information collection requirements of Task 1 formed the basis of what has been referred to as a “discovery” phase with a particular focus on identifying the nature of flood risk in the regions, flood mitigation and management practices, and projects that reduce flood risk without negatively affecting neighboring areas. Key elements of this discovery process included:

- Acquisition and review of available information from secondary sources, such as data available online from TWDB and other agencies (e.g., FEMA, Corps of Engineers), existing watershed models, FEMA Flood Insurance Maps and claims data, reports of previous investigations and studies, city and county flood hazard mitigation plans, and local ordinances related to floodplain management. Technical consultant team experience has also been incorporated.
- Information was also requested directly from key stakeholders (e.g., city and county floodplain administrators, emergency response coordinators) and the public through an online survey. The *Region 10 Data Collection Survey Tool and Interactive Webmap* included more than 90 questions, data upload requests, and interactive maps addressing the full array of topics and information relevant to regional flood planning. A copy of the survey questionnaire can be viewed on the [Region 10 website](#). In addition to the online survey, the technical consultant team has and will continue to reach out directly to key stakeholders to acquire additional information and input and/or to clarify any questions about information on hand. Responses to the online survey include 44 percent of the region’s counties (19 counties), 33 percent of the region’s communities (16 communities), two river authorities, one municipal utility district, and one council of government.
- The Technical Consultant has also initiated direct outreach to key community stakeholders, particularly those located in areas with significant data and information gaps.

Responses to the survey include 44 percent of the region’s counties (19 counties), 33 percent of the region’s communities (16 communities), two river authorities, one municipal utility district, and one council of government. Task 1 is substantially complete. The results have been compiled and are presented in a draft of Chapter 1 of the RFP. This draft has been made available to and reviewed with the Region 10 RFPG and is also available for public review and comment on the Region 10 RFPG website.

Task 2 – Existing and Future Condition Flood Risk

While developing a comprehensive flood risk model of the region is beyond the scope of this planning effort, the TWDB “floodplain quilt” that is being used in the planning process is “stitched” together from various sources of data to provide comprehensive coverage of all known existing statewide flood hazard information. The Floodplain Quilt combines numerous data layers from FEMA, including effective floodplain maps, preliminary maps, base level elevation (BLE) maps, as well as data from other federal agencies. Information drawn from local and regional flood studies is being used to refine the region’s Floodplain Quilt “patches” derived from such sources.

Development of Task 2 – Flood Risk Analysis is contingent upon the incorporation of the cursory floodplain dataset provided by TWDB, also referred to as the Fathom dataset. The TWDB recommends the use of the Fathom datasets to areas where no other data source has been identified or areas where flood hazard information is outdated or unreliable. The Fathom dataset was provided to the RFPG on October 29, 2021, and therefore has not been fully processed and assessed for incorporation into Technical Memorandum No. 1. Once the datasets are processed, the Floodplain Quilt will be reassembled using updated flood risk patches. As outlined in the TWDB Extension of Time to Complete Technical Memorandum (dated August 17, 2021) and associated

Technical Memorandum Data Deliverable Clarification (dated October 29, 2021), the TWDB has extended the submittal deadline of these Task 2 items to March 7, 2022.

Task 3 – Floodplain Management and Flood Mitigation Practices and Goals

Task 3 consists of two related parts: Task 3A – Evaluation and Recommendations on Floodplain Management Practices and Task 3B - Flood Mitigation and Floodplain Management Goals.

For Task 3A TWDB requirements include:

- Assessment of current floodplain management and land use practices within the region;
- Consideration as to how the lack of, or insufficient, or ineffective floodplain management and land use practices may increase existing and future flood risk;
- Assessment of how future flood risk may change over time; and
- Consideration recommendations for forward-looking floodplain management, land use, and economic development policies, practices, standards, and strategies that should be implemented by entities within the region.

Substantial progress has been made on Task 3A and is documented and presented in a preliminary draft of Chapter 3, which is also available for review and comment on the Region 10 website. This includes a substantially complete draft of required Table 3 which provides an at-a-glance overview of the current state of National Flood Insurance Program participation by eligible entities within the region. Information about existing floodplain management practices in the Lower Colorado-Lavaca region was also obtained through the *Region 10 Data Collection Survey Tool and Interactive Webmap* and from other sources. Refinements and additions to the Task 3A portion of Chapter 3 will be forthcoming as work on other related tasks is completed (e.g., Tasks 2A/B and 5).

Task 3B, also substantially complete, is presented in the draft of Chapter 3 and is also included as *Attachment 3* to this Technical Memorandum. This portion of draft Chapter 3 was approved by the Lower Colorado-Lavaca RFPG at its November 15, 2021, meeting. Again, it should be noted that refinements and additions to this portion of Chapter 3 will occur as work progresses on other related tasks. TWDB requires that the RFPG adopt specific and achievable short-term (10 years) and long-term (30 years) goals to guide the regional flood planning process.

As adopted by the RFPG, the draft goals do not at this time include specific quantifiable targets or performance measures. Those will be added as work on other related tasks progresses—most importantly, the work to be performed under Task 5 - Recommendation of FMEs and FMSs and Associated FMPs. For example, until such time as the entirety of recommendations relating to studies (FMEs) various types takes shape, it is not possible to establish a meaningful metric for the goals related to completion of such studies. Similarly, there is no objective basis at this time to estimate a reduction in “...the number of structures and critical facilities that are at high risk of repetitive loss through the implementation of structural flood mitigation projects” until such time as potential projects (FMPs) are defined, evaluated, and the benefits aggregated. Accordingly, the inclusion of required short-term and long-term performance measures for each of the adopted draft goals will occur later in the planning process (e.g., Spring 2022).

Task 4 – Needs Analysis and Potential FMEs, FMSs and FMPs

Task 4 consists of two related parts:

- Task 4A – Flood Mitigation Needs Analysis, and
- Task 4B – Identification and Evaluation of Potential Flood Management Evaluations (FMEs), Potentially Feasible Flood Management Strategies (FMSs), and Flood Mitigation Projects (FMPs).

Task 4A includes the identification of locations that have the greatest flood mitigation and flood study needs by the evaluation of high flood risk or flood prone areas, areas lacking sufficient models or maps, historic flooding, and emergency needs. Task 4A also includes the initial collection and compilation of potential evaluations (FMEs), strategies (FMSs), and projects (FMPs) that will be further advanced through Task 4B and 5 activities as well as RFPG recommendations. Substantial progress has been made on Task 4A related to the initial collection of potential evaluations, studies and projects. Completion of the Task 4A assessment of areas with the greatest risk and need is contingent upon substantial completion of Task 2’s existing and future flood risk analysis.

Task 4B includes the development of a screening process and initial screening-level evaluation of potential evaluations, studies and projects identified in Task 4A. As of November 2021, flood-related studies and plans have been collected, compiled, and initially screened utilizing 15 previous floodplain studies, 18 hazard mitigation plans, two drainage master plans, six flood protection planning studies, and four mitigation or capital improvement studies. Substantial progress has been made on Task 4A related to potentially feasible evaluations, studies and projects. Substantial completion of draft Chapter 4 is projected by February 2022.

Task 8 – Administrative, Regulatory, and Legislative Recommendations

Work on Task 8 – Administrative, Regulatory and Legislative Recommendations was initiated at the July 19, 2021 RFPG meeting. A brainstorming session was facilitated by the technical consultant to identify an initial set of “policy” issues of potential interest, which may become the subject of RFPG recommendations for inclusion in the regional flood plan. Over the course of subsequent RFPG meetings, this list will be refined and prioritized. Background research will be conducted as needed by the technical consultant to frame each issue of interest and develop policy options. It is anticipated that this process will conclude by June 2022 with the adoption of policy recommendations by the Lower Colorado-Lavaca RFPG.

Look-Ahead – Process for August 2022 Draft Regional Flood Plan

The submittal of Technical Memorandum No. 1 marks the conclusion of the discovery or data collection phase of the regional flood planning process. However, as noted previously, the substantial completion of Tasks 2A/B and 4A/B is in progress and the results will be documented in Technical Memorandum No. 2 and submitted to TWDB on or before March 7, 2022. Similarly, Task 3B – Flood Mitigation and Floodplain Management Goals will be advanced with the addition of quantifiable short- and long-term performance metrics. In terms of the schedule for the regional flood plan development phase, the driver is the requirement for the RFPG to adopt and submit an initial draft Regional Flood Plan to TWDB by August 1, 2022.

The table below presents an overview of the projected work to be completed and the general sequence of actions the RFPG will follow during this next phase of the planning process.

Table 4: Projected Progress by Task

Task / Description		Current (Nov) Progress	Projected Progress
Task 1	Planning Area Description	Substantially complete – The draft Chapter 1 has been provided to the RFPG and public for review and comment.	The content of draft Chapter 1 will be subject to further refinement, as appropriate, based on comments and suggestions received from the RFPG and the public as well as advancements in the planning process particularly related to refined flood risk information (Task 2).
Task 2A	Existing Condition Flood Risk	Partially complete – Floodplain Quilt patches have been generated using collected and researched information.	The Fathom datasets are being processed to generate additional flood risk patches. Substantial completion is projected by February 2022 with

Task / Description		Current (Nov) Progress	Projected Progress
			approval by the RFPG to submit to TWDB by March 7, 2022.
Task 2B	Future Condition Flood Risk	Partially complete – Future Condition Floodplain Quilt patches have been generated using collected and researched information in addition to the coordination of estimation methodologies with other consultants and regions.	Along with Task 2A, substantial completion is projected by February 2022 with approval by the RFPG to submit to TWDB by March 7, 2022.
Task 3A	Floodplain Management Practices	Substantially complete – The draft Task 3A table has been provided to the RFPG and public for review and comment.	The content of draft Chapter 3 will be subject to further refinement, as appropriate, based on comments and suggestions received from the RFPG and the public as well as advancements in the planning process.
Task 3B	Mitigation & Management Goals	Substantially complete – The draft goal statements have been provided to the RFPG and public for review and comment and were subsequently adopted by the RFPG.	Quantitative short- and long-term performance metrics will be defined, adopted by the RFPG, and incorporated into draft Chapter 3 as the planning process advances, particularly with substantial completion of Task 5 – Recommendation of FMEs, FMSs and FMPs.
Task 4A	Needs Analysis	Partially complete – An initial listing of potential FMEs, FMPs and FMSs have been generated using collected and researched information.	The content of draft Chapter 4 will be refined as the planning process advances particularly with refined flood risk information (Task 2) to identify areas of greatest flood risk and need for mitigation.
Task 4B	Identify FMEs, FMSs and FMPs	Partially complete – The draft identification and evaluation process has been provided to the RFPG and public for review and comment and was subsequently approved by the RFPG.	Substantial completion of draft Chapter 4 tables and geospatial files is projected by February 2022 with approval by the RFPG to submit to TWDB by March 7, 2022.
Task 4C	Technical Memorandum	Partially complete – The draft Technical Memorandum No. 1 has been provided to the RFPG and public for review and comment.	Seeking RFPG approval on December 16, 2021, for submittal of Technical Memorandum No. 1 to TWDB by January 7, 2022. Substantial completion of draft Technical Memorandum No. 2 is projected by February 2022 with approval by the RFPG to submit to TWDB by March 7, 2022.
Task 5	Evaluate / Recommend FMEs, FMSs and FMPs	Initial stages – Will advance data collection and refinement of FMEs, FMSs, and FMPs including development of template fact sheets to support decision making.	Seeking RFPG formation of a recommendation sub-committee by January 2022. Substantial completion of evaluations necessary to support RFPG recommendations are projected by March 2022. Substantial completion of draft recommendations and Chapter 5 are projected by May 2022 with approval by the RFPG to submit to TWDB by August 1, 2022.
Task 6A	Impacts of Regional Plan	Not yet initiated – requires substantial completion of Task 5 – Recommendation of FMEs, FMSs and FMPs.	Substantial completion of Chapter 6 is projected by May 2022 with approval by the RFPG to incorporate into the draft RFP for submittal to TWDB by August 1, 2022.

Task / Description		Current (Nov) Progress	Projected Progress
Task 6B	Contribution / Impacts of Water Supply	Not yet initiated – requires substantial completion of Task 5 – Recommendation of FMEs, FMSs and associated FMPs.	Substantial completion of Chapter 6 is projected by May 2022 with approval by the RFPG to submit to TWDB by August 1, 2022.
Task 7	Flood Response Information & Activities	Not yet initiated – Data collection and assessment anticipated to commence in January 2022.	Substantial completion of Chapter 7 is projected by May 2022 with approval by the RFPG to submit to TWDB by August 1, 2022.
Task 8	Admin, Regulatory & Legislative Recommendations	Initial stages – continue to refine list of policy issues of interest based on comments and suggestions received from the RFPG and the public.	Substantial completion of Chapter 8 is projected by May 2022 with approval by the RFPG to submit to TWDB by August 1, 2022.
Task 9	Flood Infrastructure Finance	Not yet initiated – Data collection and assessment anticipated to commence in March 2022.	Substantial completion of Chapter 9 is projected by May 2022 with approval by the RFPG to submit to TWDB by August 1, 2022.
Task 10	Public Involvement & Plan Adoption	Ongoing – Continued public and stakeholder outreach and engagement.	Compilation of draft Chapters 1-9 into an initial draft Regional Flood Plan will be subject to further refinement, as appropriate, based on comments and suggestions received from the RFPG and the public as well as advancement of the planning process. Substantial completion of initial draft Regional Flood Plan is projected by June 2022 with approval by the RFPG in July 2022 and submittal to TWDB by August 1, 2022.

Task 4C – Technical Memorandum No. 1 Deliverables

The following sections introduce the required Technical Memorandum No. 1 deliverables for the initial phase of the regional flood planning process for the Lower Colorado-Lavaca region.

4C.1a – List of existing political subdivisions with flood-related authority/responsibility

TWDB provided a list of 348 political subdivisions, or entities, that were thought to have some degree of flood-related authority in the region. It is important to note that in the broadest sense, “authority” could be any public entity/agency that plans, regulates, constructs or maintains flood and/or drainage infrastructure. In a more narrow sense, “authority” would only include entities with the authority to enact and enforce floodplain regulations (e.g., municipalities, counties and river authorities). *Table 5* below provides a summary of the entity types within the region. A complete list of entities is provided in *Attachment 1*.

Table 5: Political Subdivisions with Potential Flood-Related Authority

Entity Types	Number of Entities	NFIP Participants
Municipality	92	84
County	43	43
River Authority	3	N/A
Flood Control, WCIDs, Drainage Districts, Ports, Navigation Districts	70	N/A
Water Supply, Improvement, Utility Districts, MUDs, FWSDs, MWDs, SUDs, COGs	140	N/A

Source: TWDB Data Hub

Input from representatives from each political subdivision in the region has been solicited in an effort to obtain needed information for each entity. Approximately 25 percent of the entities that received an invitation to participate in the flood planning process via the *Region 10 Data Collection Survey Tool and Interactive Webmap* provided at least some measure of response at varying levels of detail. A list of existing floodplain management practices was compiled using collected and researched information as displayed in *Attachment 1*.

Geospatial files for political subdivisions with flood-related authority are provided *Attachment 7*. The geodatabase feature classes titled 'Entities' and 'ExFpMP' provide a spatial representation of existing political subdivisions with flood-related authorities or responsibilities.

4C.1b and 4C.1f – List of previous flood studies and models relevant to plan development

A list of previous studies has been compiled using collected and researched information and is presented in *Attachment 2*. The previous flood studies and associated models included on the list are those that are being used to refine the region's Floodplain Quilt and/or studies that are being used to identify/validate potential evaluations, strategies and/or projects. In addition to provided studies via the *Region 10 Data Collection Survey Tool and Interactive Webmap*, the previous studies were collected through the online searches and consultant team experience in the region. Study reports and communication with study sponsors reveal whether hydrologic and hydraulic models are available or presumed available. As the planning process continues the list of previous studies will be enhanced to document all available sources of information relevant to flood plan development within the Lower Colorado-Lavaca region.

4C.1c-e – Lists, maps and geodatabase of existing and future condition flood risk and gaps

Development of Task 4C.1c-e deliverables is contingent upon full processing of the TWDB provided cursory floodplain dataset, also referred to as the Fathom dataset. The Fathom dataset was provided to the RFPG on October 29, 2021, and therefore has not been fully processed and assessed to incorporate results into Technical Memorandum No. 1. As outlined in the TWDB Extension of Time to Complete Technical Memorandum (dated August 17, 2021) and associated Technical Memorandum Data Deliverable Clarification (dated October 29, 2021), the TWDB has extended the submittal deadline of these items to March 7, 2022.

4C.1g – Flood mitigation and floodplain management goals adopted by the RFPG

One of the critical components of the inaugural regional and state flood planning process is the development of flood mitigation and floodplain management goals. The Lower Colorado-Lavaca RFPG has spent a significant amount of time and resources exploring values and discussing what they felt were the suitable goals for their region. *Attachment 3* presents the adopted draft flood mitigation and floodplain management goals for the Lower Colorado-Lavaca Region. The associated geospatial table titled 'Goals' is included in the geodatabase located in *Attachment 7*.

As set out in the Guidance Principles in 31 TAC §362.3, the overarching intent of the region's goals must be "to protect against the loss of life and property." This is further defined to:

1. Identify and reduce the risk and impact to life and property that already exists, and
2. Avoid increasing or creating new flood risk by addressing future development within the areas known to have existing or future flood risk.

The goals, when implemented, must demonstrate progress towards the overarching goal set forth by the state. As part of the goal setting process, the RFPG adopted goals covering six focus areas. These focus areas were defined to create a one-to-one connection with the Flood Management Strategy (FMS) types as outlined in TWDB's Exhibit D: Data Submittal Guidelines for Regional Flood Planning.

The adopted goals will guide the development of the strategies (FMSs), evaluations (FMEs), and projects (FMPs) for the Lower Colorado-Lavaca region. They build upon TWDB regional flood planning guidance and provide a comprehensive framework for future strategy development focused on reducing flood risk to people and property, while not negatively affecting neighboring areas.

The six goal focus areas include:

1. Flood Education and Outreach
2. Flood Warning and Readiness
3. Flood Studies and Analysis
4. Flood Prevention
5. Non-Structural Flood Infrastructure Projects
6. Structural Flood Infrastructure Projects

Per Texas Water Development Board (TWDB) requirements and guidelines, the goals adopted by the RFPG must be specific and achievable and include the information listed below:

- Description of the goal
- Term of the goal set at 10 years (short-term) and 30 years (long-term)
- Extent or geographic area to which the goal applies
- Residual risk that remains after the goal is met
- Measurement method that will be used to measure goal attainment
- Association with overarching goal focus areas

Quantitative short- and long-term performance metrics will be defined, reviewed, and adopted by the RFPG for incorporation in Chapter 3 as advancements in the planning process progress particularly related to substantial completion of Task 5 – Recommendation of FMEs, FMSs, and FMPs.

4C.1h – Process to identify potentially feasible FMSs and FMPs

TWDB requirements for Task 4B state that each RFPG is to develop and receive public comment on a “...proposed process to be used by the RFPG to identify and select flood management evaluations, flood mitigation strategies, and flood mitigation projects.” The proposed process was designed to conform with TWDB requirements as expressed in rules, scope of work, and technical guidelines for regional flood planning.

The proposed process for screening, evaluation and recommendation of potential evaluations (FMEs), strategies (FMSs), and projects (FMPs) was introduced during the August 16, 2021, RFPG meeting. Subsequently, at the October 18, 2021 meeting, the RFPG reviewed and discussed the proposed process and accepted public comment. At the November 15, 2021, RFPG meeting, the RFPG approved the proposed process as provided in *Attachment 4*.

4C.1i – List of potential FMEs and potentially feasible FMSs and FMPs

The TWDB scope of work and technical guidelines state that Task 4 activities include initial collection and assessment of potential evaluations (FMEs), strategies (FMSs), and projects (FMPs) that will be further advanced through Task 5 activities and RFPG recommendations. The FMEs, FMSs and FMPs included with this Technical Memorandum in *Attachment 5* are preliminary and subject to further refinement based on comments and suggestions received from the RFPG and the public as well as advancements in the planning process particularly through Task 5.

4C.1j – List of FMSs and FMPs that were determined infeasible

Using the screening process outlined in *Attachment 4*, a list of screened strategies (FMSs) and projects (FMPs) was developed as provided in *Attachment 6*. The majority of strategies and projects that were determined to be infeasible for regional flood planning included hazard mitigation activities that do not reduce flood risk such as

tree maintenance. The list of 265 infeasible projects includes flood risk reduction projects that do not reduce 100-year flood risk. There are provisions in the TWDB technical guidelines that allow for RFPG adjustments to the screening process which may be considered as the planning process advances.

4C – Technical Memorandum No. 1 Geodatabase

As outlined in the TWDB Extension of Time to Complete Technical Memorandum dated August 17, 2021, and associated Technical Memorandum Data Deliverable Clarification dated October 29, 2021, the following table outlines geodatabase deliverables included with this Technical Memorandum. Specific data deliverables and formatting are in alignment with the TWDB’s Exhibit D: Data Submittal Guidelines for Regional Flood Planning. The digital geodatabase is located in *Attachment 7*.

Table 6: Task 4C Geodatabase

File No.	Item Name	Description	Submittal Milestone	Feature Class Name	Submittal Deadline Notes
1	Entities	Entities with flood-related authority and whether they are actively engaged in flood planning, floodplain management and flood mitigation activities.	Technical Memo (limited fields)	Entities	Submit on January 7, 2022.
2	Watersheds	The spatial layer for watersheds with associated FME, FMS and FMPs.	Technical Memo	Watersheds	Submit initial data on January 7, 2022 with limited fields as these will be refined as FMEs, FMSs, and FMPs are advanced.
3	Existing Infrastructure	A general description of the location, condition and functionality of existing natural flood mitigation features and constructed major flood infrastructure within the FPR.	Technical Memo	ExFldInfraPol	Submit on January 7, 2022.
4			Technical Memo	ExFldInfraLn	Submit on January 7, 2022.
5			Technical Memo	ExFldInfraPt	Submit on January 7, 2022.
6	Proposed or Ongoing Flood Mitigation Projects	Proposed or ongoing flood mitigation projects currently under construction, being implemented; and with dedicated funding to construct and the expected year of completion.	Technical Memo	ExFldProjs	Submit on January 7, 2022.
7*	Existing Flood Hazard	Perform existing condition flood hazard analyses to determine the location and magnitude of both 1.0% annual chance and 0.2% annual chance flood events.	Technical Memo	ExFldHazard	Submit on March 7, 2022 along with Technical Memorandum No. 2.
8*	Flood Mapping Gaps	Gaps in inundation boundary mapping.	Technical Memo	Fld_Map_Gaps	Submit on March 7, 2022 along with Technical Memorandum No. 2.
9*	Existing Exposure	Develop high-level, region- wide, and largely GIS-based existing condition flood exposure analyses using the information identified in the flood hazard analysis to identify who and what might be harmed within the region for, at a minimum, both 1.0% annual chance and 0.2% annual chance flood events.	Technical Memo	ExFldExpPol	Submit on March 7, 2022 along with Technical Memorandum No. 2.
10*			Technical Memo	ExFldExpLn	Submit on March 7, 2022 along with Technical Memorandum No. 2.
11*			Technical Memo	ExFldExpPt	Submit on March 7, 2022 along with Technical Memorandum No. 2.
12*			Technical Memo	ExFldExpAll	Submit on March 7, 2022 along with Technical Memorandum No. 2.
		Combines the Exposure Poly, Line, and Point data into a single master layer, also includes Vulnerability data.			

File No.	Item Name	Description	Submittal Milestone	Feature Class Name	Submittal Deadline Notes
13*	Future Flood Hazard	Perform future condition flood hazard analyses to determine the location and magnitude of both 1.0% annual chance and 0.2% annual chance flood events.	Technical Memo	FutFldHazard	Submit on March 7, 2022 along with Technical Memorandum No. 2.
14*	Future Exposure	Perform future condition flood exposure analyses using the information identified in the flood hazard analysis to identify who and what might be harmed within the region for, at a minimum, both 1.0% annual chance and 0.2% annual chance flood events. Combines the Exposure Poly, Line, and Point data into a single master layer, also includes Vulnerability data.	Technical Memo	FutFldExpPol	Submit on March 7, 2022 along with Technical Memorandum No. 2.
15*			Technical Memo	FutFldExpLn	Submit on March 7, 2022 along with Technical Memorandum No. 2.
16*			Technical Memo	FutFldExpPt	Submit on March 7, 2022 along with Technical Memorandum No. 2.
17*			Technical Memo	FutFldExpAll	Submit on March 7, 2022 along with Technical Memorandum No. 2.
18	Existing Floodplain Management Practices	Identify areas with existing floodplain management practices, identify common and compare contrasting practices within the region, and acknowledge locations that may lack floodplain management.	Technical Memo	ExFpMP	Submit on January 7, 2022.
19	Goals	Identify specific and achievable flood mitigation and floodplain management goals along with target years by which to meet those goals.	Technical Memo (limited fields)	Goals	Submit on January 7, 2022.
20	Streams	Shows the streams to be studied by FMEs, and those relevant to FMS and FMPs, when applicable.	Technical Memo	Streams	Submit on January 7, 2022.
21	Flood Management Evaluations	Flood Management Evaluations will identify areas requiring flood risk evaluation.	Technical Memo (limited fields)	FME	Submit initial data on January 7, 2022 with limited fields as these will be refined as the planning process advances.
22	Flood Mitigation Projects	Flood Mitigation Projects reduce flood risk through a variety of approaches. The service area is the region impacted by the project.	Technical Memo (limited fields)	FMP	Submit initial data on January 7, 2022 with limited fields as these will be refined as the planning process advances.
23*	Post-project Hazard	Project specific features showing an updated hazard area that accounts for the impact of the project.	Draft Plan	FMP_HazPost	Not required in Tech Memo, so will be a deliverable on August 1, 2022.
24*	Project Details	A table included in the .gdb but built using the Project Details excel template. The table includes more detailed analysis of the project.	Draft Plan	FMP_Details	Not required in Tech Memo, so will be a deliverable on August 1, 2022.
25	Flood Management Strategies	Flood Management Strategies can be a broad array of policy or other strategies that aid in flood management.	Technical Memo (limited fields)	FMS	Submit initial data on January 7, 2022 with limited fields as these will be refined as the planning process advances.

*These features are not included in this Technical Memorandum No. 1 deliverables.

Technical Memorandum Attachments

- Attachment 1. 4C.1a – List of existing political subdivisions with flood-related authority/responsibility
- Attachment 2. 4C.1b and 4C.1f – List of previous flood studies and models relevant to plan development
- Attachment 3. 4C.1g – Flood mitigation and floodplain management goals adopted by the RFPG
- Attachment 4. 4C.1h – Process to identify potentially feasible FMSs and FMPs
- Attachment 5. 4C.1i – List of potential FMEs and potentially feasible FMSs and FMPs
- Attachment 6. 4C.1j – List of FMSs and FMPs that were determined infeasible
- Attachment 7. 4C – Geodatabase

DRAFT