Region 2 Lower Red-Sulphur-Cypress Regional Flood Planning Group Meeting
December 15, 2022
2:00 pm
at
Northeast Texas Community College
Community Room - (Hum 101),
2886 FM 1735, Chapel Hill Road,
Mount Pleasant, TX 75455
or
Via teleconference/webinar
Use the following information to register for the meeting:
https://us06web.zoom.us/meeting/register/tZUvc-GuqTMrE9ZLVw5HQgjp6m5888jeW-7i
after registering, you will receive a confirmation email containing information about joining the meeting.

If you experience issues while registering or do not have access to a computer, please contact Paul Prange no less than two (2) workdays prior to the meeting at 903.255.3519 or pprange@atcog.org.

Agenda:

1. Call to Order
2. Welcome
3. Confirmation of attendees / determination of quorum
4. Public Comments – limit 3 minutes per person
5. *Consider approval of minutes for the meeting held on November 3, 2022

Presentations

6. Texas Water Development Board Update
7. Region 1 Canadian-Upper Red Regional Flood Planning Group Update

Technical Consultant Update

8. Technical Presentation by Halff Associates, Inc.
    - Final Regional Flood Plan (RFP) – The draft of the Final RFP, including text, tables, and figures, is available here Final_RFP_Files.zip. In the Word documents we have left tracked changes enabled. This will allow the RFPG and public to focus their review only on items that changed since the Draft Regional Flood Plan was submitted in August. The appendices also changed as follows: Maps were updated to reflect final data and cosmetic changes requested by TWDB; tables were updated to reflect the final FMXs; and a new appendix was included that covers public comments.
        i. Present
        ii. Discuss comments
        iii. *Consider approval for submission of Final Regional Flood Plan to TWDB before January 10, 2023.
    - Task 12 – Conduct FMEs status update.
    - Schedule

Other Business

9. Update from Planning Group Sponsor
10. Consider date and agenda items for next meeting
11. Adjourn

***Denotes Action Items**

If you wish to provide written comments prior to or after the meeting, please email your comments to pprange@atcog.org and include "Region 2 RFPG Meeting" in the subject line of the email – OR – you may mail your comments to Region 2 RFPG, c/o ATCOG – Paul Prange, 4808 Elizabeth St, Texarkana, TX 75503.

If you wish to provide oral public comments at the meeting, please submit a request via email to pprange@atcog.org , include "Region 2 RFPG Meeting Public Comment Request" at least 2 hours prior to the meeting, and follow the registration instructions at top of page 1 of the Agenda.

Additional information may be obtained from: www.texasfloodregion2.org, or by contacting Paul Prange at pprange@atcog.org, 903-832-8636, -or- Region 2 RFPG, c/o ATCOG, 4808 Elizabeth St, Texarkana, TX 75503

All meeting agendas and notices will be posted on our website at www.texasfloodregion2.org. If you wish to be notified electronically of RFPG activities, please submit a request to pprange@atcog.org, include "Request for notification of Region 2 RFPG activities". This request will be honored via email only unless reasonable accommodations are needed.

Meeting Minutes
Region 2 Lower Red-Sulphur-Cypress Flood Planning Group Meeting
November 3, 2022
2:00 p.m.
at
Northeast Texas Community College, Community Room – (Hum 101), 2886 FM 1735, Chapel Hill Road, Mount Pleasant, TX 75455 and Via Zoom Webinar/Teleconference

Roll Call:

Voting Member	Interest Category	Present (x) /Absent ( ) / Alternate Present (*)
Preston Ingram (William)	Agricultural interests	X
Andy Endsley	Counties	
W. Greg Carter	Electric generating utilities	X
Laura-Ashley Overdyke	Environmental interests	X
Casey Johnson	Industries	
Dustin Henslee	Municipalities	X
Troy Hudson	Public	
R. Reeves Hayter	River authorities	X
Kelly Mitchell	Small business	
David Weidman	Water districts	X
Susan Whitfield	Water utilities	X

Non-voting Member	Agency	Present(x)/Absent( )/ Alternate Present (*)
James (Clay) Shipes	Texas Parks and Wildlife Department	
Andrea Sanders (Jose Rosales-Alternate)	Texas Division of Emergency Management	X
Darrell Dean	Texas Department of Agriculture	X
Tony Resendez	Texas State Soil and Water Conservation Board	X
Trey Bahm	General Land Office	
Anita Machiavello (Ryke Moore-Alternate)	Texas Water Development Board (TWDB)	X
Michelle Havelka	Texas Commission on Environmental Quality	X
Lisa M. Mairs	USACE, Galveston District	X
Travis Wilsey	USACE, Tulsa District	
Randy Whiteman	RFPG 1 Liaison	
Richard Brontoli	Red River Valley Association	X
Jason Dupree	TxDOT – Atlanta District	
Dan Perry	TxDOT – Paris District	X

Quorum:
Quorum: **Yes**
Number of voting members or alternates representing voting members present: **7**
Number required for quorum per current voting membership of **10**: **6**

Other Meeting Attendees: **
Kathy McCollum - ATCOG
Paul Prange – ATCOG
Joshua McClure – Halff Associates Team
David Rivera – Halff Associates Team
Gini Connolly – Halff Associates Team
James Bronikowski – TWDB

**Meeting attendee names were gathered from those who entered information for joining the Zoom meeting.

All meeting materials are available for the public at:
http://www.twdb.texas.gov/flood/planning/regions/schedule.asp.

AGENDA ITEM NO. 1: Call to Order
Greg Carter called the meeting to order at 2:04 p.m.

AGENDA ITEM NO. 2: Welcome
Greg Carter welcomed members and attendees to the Region 2 Lower Red-Sulphur-Cypress Flood Planning Group meeting.

AGENDA ITEM NO. 3: Confirmation of attendees / determination of a quorum
Greg Carter asked ATCOG staff member, Paul Prange, to conduct a roll call of attendees.
Each present voting and non-voting member of the Region 2 Lower Red-Sulphur-Cypress RFPG introduced themselves, establishing that a quorum had been met. Seven voting members were present along with eight non-voting members.

AGENDA ITEM NO. 4: Public comments – limit 3 minutes per person
Greg Carter opened the floor for public comments. No public comments were received.

AGENDA ITEM NO. 5: *Consider approval of minutes for the meetings held Thursday, September 1, 2022, and Thursday, September 22, 2022.
Greg Carter opened the floor for discussion and approval of the minutes from the previous meetings. Laura-Ashley Overdyke asked for a minor amendment in reference to the TPWD comments received. A motion was made by Reeves Hayter and was seconded by Laura-Ashley Overdyke to approve the minutes as amended. The motion carried unanimously.

PRESENTATIONS

AGENDA ITEM NO. 6: Texas Water Development Board Update:
Greg Carter turned the floor over to Ryke Moore, attending for Anita Machiavello, who announced that the TWDB provided comments to the Region 2 Draft Flood Plan and a formal response is required from the planning group. Mr. Moore also stated that the TWDB will host a conference call for technical consultants on November 9th to discuss general questions relating to the comments. A stakeholder meeting was held on November 1st to discuss changes to TWDB rules during the next planning cycle. The TWDB is looking forward to receiving the flood plan in January 2023, and the amended plan in July 2023. Additional guidance will be provided by TWDB in the coming weeks. Greg Carter asked about the stakeholder survey and Mr. Moore started that it will be open for comment until November 4th.

AGENDA ITEM NO. 7: Region 1 Canadian-Upper Red Regional Flood Planning Group Updates:
Greg Carter asked for any updates relating to Region 1 flood planning activities. Region 1 liaison, Randy Whiteman, was not present so Joshua McClure and David Rivera announced that Region 1 is on approximately the same schedule as Region 2. Mr. Rivera also announced that he is working closely with Regions 1 and 4 to keep track of their progress, as well.

TECHNICAL CONSULTANT UPDATE

AGENDA ITEM NO. 8: Technical Presentation by Halff Associates, Inc.

- **Update on Draft Regional Flood Plan**
  1. **Review TWDB comments**
  2. ***Consider approving the Technical Consultant to submit preliminary responses to these comments to TWDB**
- **Task 12 – Perform Identified FME, Identify, Evaluate, and Recommend Additional FMPs**
  1. **Update on studies**
  2. **Review revised Technical Consultant (TC) recommendations**
     - **Discuss Potential FMPs**
     - ***Consider approval of TC recommended list**
- **Schedule**
  1. **Revised Draft RFP submittal to RFP**
  2. **Select December meeting date**
  3. **Final RFP due to TWDB on January 10, 2023**
  4. **Task 12 Schedule**

Greg Carter turned the floor over to Joshua McClure who began discussion of the Draft RFP Comments received from TWDB, Task 12- Technical Committee Recommendations for FMEs to FMPs, and the upcoming schedule of deliverables. Mr. McClure started with Task 12 and provided an update of activities and recent communication between Halff Associates, Inc. and the cities of Paris, Nash, Texarkana, Denison, Bonham, and Atlanta, relating to potential projects. Mr. McClure then turned the presentation of Task 12 over to David Rivera who provided a summary of potential FMP Candidates. Mr. Rivera announced that only two potential projects are currently pending, and they are both located within the City of Atlanta, TX. The results of follow-up discussions with these cities indicate that 7 FMEs can be elevated to FMPs in the Region 2 Flood Plan and 2 FMEs are questionable. Mr. Rivera provided a summary of details for each city and discussion took place among the group. Greg Carter asked Mr. Rivera about the project for the City of Texarkana, regarding the installation of flood gauges at flood-prone intersections being a public safety measure, which may increase the chances of funding by TWDB. Mr. Rivera and Mr. McClure stated that this project may receive a higher priority, but it all depends on how the TWDB ranks the projects based on all the criteria. Mr. Carter then asked about the potential project for the City of Denison. Mr. McClure elaborated on the situation in Denison and provided details of potential projects in Sulphur Springs and Paris, as well. Additional discussion took place among the group. Mr. Carter asked if there were any additional comments and Reeves Hayter stated that he appreciates the extra effort by the Technical Consultants to gather additional information and this list of potential projects looks good. Mr. Carter asked for approval of the Task 12 List of FMEs to FMPs and Reeves Hayter made a motion. Greg Carter seconded the motion. The motion carried unanimously.

Joshua McClure presented the TWDB Comments from the Region 2 Draft Flood Plan and announced that 20 comments were required to be addressed and 28 comments were not. The Comments were presented in a spreadsheet with the proposed Region 2 Responses listed next to each TWDB Comment, for review and discussion by the flood planning group. Mr. McClure asked Ryke Moore if responses to

the comments were required to be submitted to TWDB prior to submittal of the Final RFP, and Mr. Moore stated that informal responses should be provided to Anita Machiavello separately, in an email. Mr. McClure then pointed out a few comments that were mostly GIS-related, and asked Gini Connolly to provide an explanation of these comments. Ms. Connolly presented data relating to Comment No. 6 from TWDB, which pertained to BLE and Cursory flood plain data (Fathom) potentially overlapping and affecting structure count and other analysis. Discussion took Place between Mr. McClure and the flood planning group. James Bronikowski, with TWDB, provided input for clarification of the 1% and 0.2% floodplain data. Mr. McClure and Mr. Bronikowski then discussed Appendix 2, as it was presented in the Draft Flood Plan. Additional discussion took place among the group, as Mr. McClure summarized each of the comments received from TWDB. Mr. Bronikowski continued to provide helpful suggestions for addressing comments. Mr. McClure then asked the Region 2 Flood Planning Group for approval to submit responses to the TWDB for additional feedback before submitting the Final RFP. Mr. Carter asked if there were any additional comments from the group and asked for a motion to approve submittal of the responses from Halff Associates, Inc. to the TWDB. A motion was made by Greg Carter and the motion was seconded by Susan Whitfield. The motion carried unanimously.

Joshua McClure announced the schedule of upcoming events including: Comments Received from TWDB on October 24th (Responses to Comments due to TWDB by November 24th), Submit Draft Final RFP to RFPG on December 1st (Minimum 14 Day Review Period), Region 2 Flood Planning Group Board of Directors Meeting on December 15th or 22nd (Meet to Discuss Comments & Approve Submission to TWDB), Optional Region 2 Board Meeting on January 5, 2023, and Submittal of Final RFP to TWDB on January 10, 2023. Discussion took place among the group relating to these upcoming deliverables and due dates. December 15th was selected as the next meeting date and Greg Carter stated that it will be imperative that we have a quorum and asked the board members to make the meeting a high priority. Chris Brown asked Paul Prange to contact the Region 2 Flood Planning Group via email and ask for confirmation of attendance.

OTHER BUSINESS

AGENDA ITEM NO. 9: Update from Planning Group Sponsor

Greg Carter turned the floor over to Chris Brown who announced that the ATCOG is currently working to address some minor changes to the amended contract between ATCOG and Half Associates, Inc. Mr. Brown also announced that Mr. Prange has been compiling the dates for various tasks due in 2023, including the selection of terms for the Region 2 Flood Planning Group Board Members (2-Year vs. 5-Year appointments) in June or July of 2023. Brief discussion took place among the group regarding term limits. Joshua McClure asked James Bronikowski if funding is in place for planning activities beyond July of 2023, and Mr. Bronikowski stated yes, the funding has been appropriated by the State Legislature for the next planning cycle. Mr. Brown asked when the contract for the second funding cycle would be developed, and Mr. Bronikowski stated that the TWDB hopes to have contracts executed around October of 2023.

AGENDA ITEM NO. 10: Consider date and agenda items for next meeting

Greg Carter opened the floor for discussion. The Region 2 RFPG board members agreed to conduct the next Region 2 Flood Planning Group Board of Directors Meeting on Thursday, December 15, 2022, at 2:00 p.m. at a location to be determined and via webinar/teleconference.

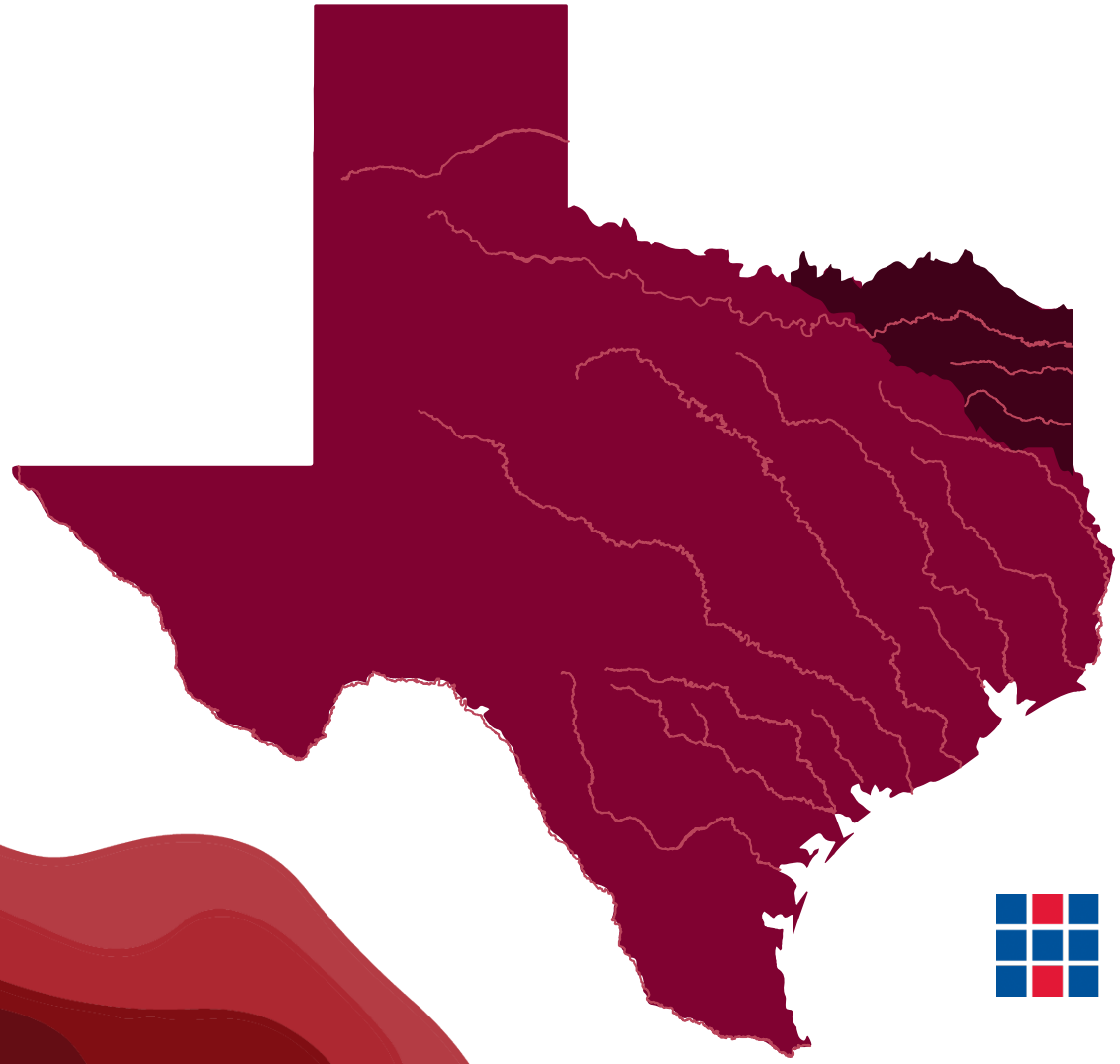
AGENDA ITEM NO. 11: Adjourn

Greg Carter made a motion to adjourn the meeting and Laura-Ashley Overdyke seconded the motion. The motion carried unanimously. The meeting was adjourned at 3:41 p.m.

Approved by the Region 2 Lower Red-Sulphur-Cypress RFPG at a meeting held on 12/15/2022.

_____

Reeves Hayter, CHAIR



Draft Regional Flood Plan Presentation
Regional Flood Planning Group 2 Meeting
Lower Red-Sulphur-Cypress

December 15, 2022

HALFF

FREESE AND NICHOLS

MTG engineers & surveyors

H2O PARTNERS

Agenda

- Task 12 Update
- Summary of Final RFP
- Discussion of Changes
- Comments
- Consider approval of the Regional Flood Plan for submittal to TWDB
- Schedule

Task 12 Update

FME ID	FME Name	Description	Sponsor	Potential candidate to elevate from FME to FMP?
021000026	Anderson Creek WWTP Flood Study	WWTP was impacted by flooding from Anderson Creek. Study to evaluate whether existing berm meets 100-year protection and to evaluate the needs for sump pumps and lift station.	City of De Kalb	YES
021000030	City of Hooks Infrastructure	Widen ditches to increase the volume capacity of flash flood waters	City of Hooks	YES
021000032	Cowhorn Creek East	Extend current H&H study limits to the upstream detention pond. Evaluate existing flooding and develop mitigation actions.	City of Texarkana	YES
021000040	City of Atlanta Eleanor St and Red Bluff St. Project/Phase No. 3	Replace culvert crossings	City of Atlanta	Potentially
021000041	City of Atlanta Park View St and Jefferson St. Project/Phase No. 4	Install culvert crossing	City of Atlanta	Potentially
021000042	City of Paris Big Sandy Cr Tribs 4 and 6 Improvements	Re-grade channel downstream of Clarksville Ave. and establish concrete channel upstream of Clarksville Ave. Channel improvements in the upper portion of Tributary 4. Tributary 6 channel improvements and culvert replacement.	City of Paris	YES
021000060	City of Texarkana Gauges	Install depth gauges and radio-controlled guard arms at three flood-prone underpasses and warning lights and a "Do Not Enter" sign at flood-prone residential intersection.	City of Texarkana	YES
021000064	Pecan to Waggoner Creek Channel Improvements	Channel improvements east of Pecan to Waggoner Creek.	City of Nash	YES
021000066	Pig Branch Watershed Culvert Study Update	Study to provide the city with updated drainage information to alleviate existing and potential flood damages for various crossings.	City of Bonham	YES

Summary of Changes to RFP

- Minor wording changes per TWDB requestUpdated exposure analyses
- Updated FME exposures and costs
- Added public comments responses to Chapter 10 and Appendix 3

Comments?

Consider approval of the Regional Flood Plan for submittal to TWDB

Schedule

- Dec 1 – Submit Draft Final RFP to RFPG
  - Minimum 14 day review period
- December 15– RFPG Meeting
  - Meet to discuss comments
  - Approve submission to TWDB
- Jan 5, 2023 – No RFPG Meeting
- Jan 10, 2023 – Submit Final RFP to TWDB
- January – March 2023 – Complete FMEs and make FMP recommendations
- April – May 2023 – Prepare Amended RFP
- June 2023 – Approve Amended RFP
- July 14, 2023 - Amended RFP Due to TWDB

EXECUTIVE SUMMARY

Table of Contents

List of Figures

List of Table

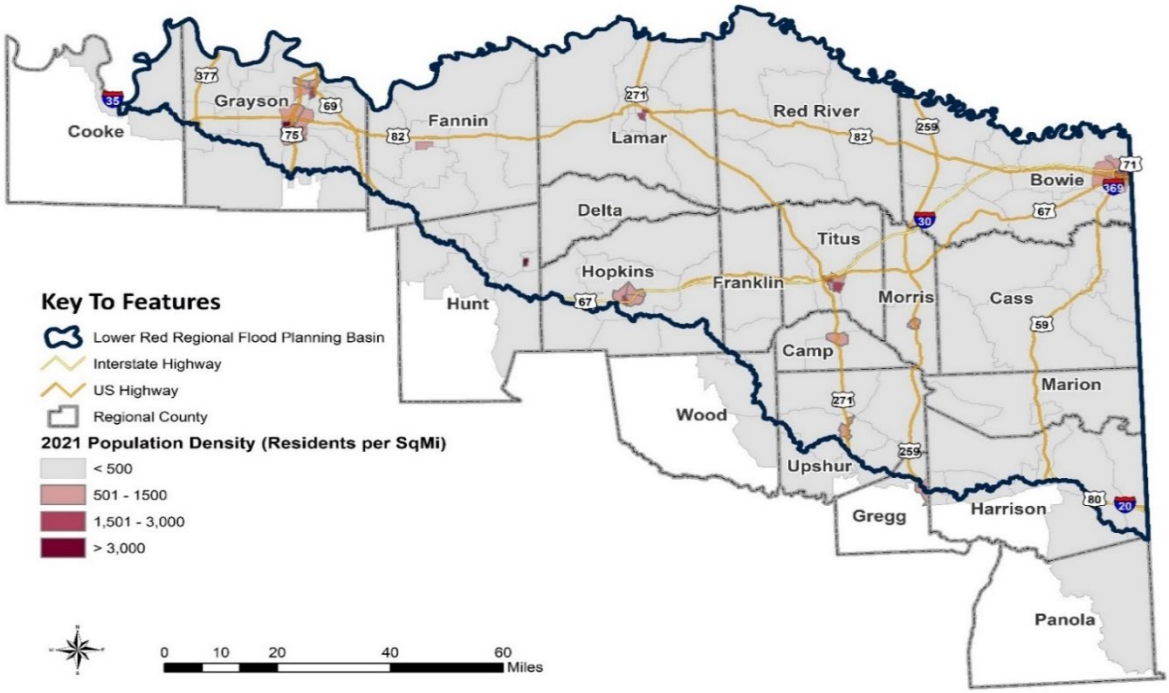
Executive Summary

In 2019, the 86th Texas Legislature passed Senate Bill 8, which authorized and established the regional and state flood planning processes. The legislature assigned the responsibility of the regional and state flood planning process to the Texas Water Development Board (TWDB). This report presents the Final ~~Draft~~ Region 2 Lower Red-Sulphur-Cypress Regional Flood Plan, representing the first-ever regionwide flood plan. Region 2 is one of 15 Regional Flood Planning Groups across the State of Texas tasked with developing a Regional Flood Plan.

Region 2 encompasses all or part of 19 counties and spans an area of 9,161 square miles. The area stretches from Gainesville in Cooke County into the northwest to Waskom (east of Marshall) to the southeast, up to Texarkana at the northeast corner. The region borders Oklahoma to the north and Arkansas and Louisiana to the east. Only the lower portion of the Red River is included, with Region 1 covering the upper Red River. The entirety of the Sulphur River and Cypress Creek basins within Texas are included in the region. Both of these streams are tributaries of the Red River in Louisiana. *Figure ES.1* represents the boundaries of Region 2.

According to the TWDB's population projections, Region 2 is one of the state's least populated flood planning areas. According to the 2019 five-year American Community Survey estimates, 531,100 residents, or less than 2 percent of Texas residents, currently reside in Region 2. Encompassing 9,161 square miles, the region is largely rural, with 57 percent of the people living in rural areas and only 44 percent living in the cities and towns. Of those living in urban areas, most live in the major cities that fall within Grayson, Lamar, and Bowie County. With roughly 43,000 residents, Sherman is the largest city within Region 2. There are significant population centers in Texarkana, Denison, and Paris as well. These cities are located along Highway 82, which runs east-west through the region. To the west, the communities of Denison and Sherman are located on the southern border with Oklahoma and the Red River. The other population centers are generally located along I-30. A few larger cities, such as Longview and Marshall, touch the southern boundary of the Region along the I-20 corridor, but those cities are mostly situated within the Sabine River Basin (Region 4).

Figure ES.1 Region 2 Lower-Red-Sulphur-Cypress Flood Planning Area



Agriculture has always been a major economic and cultural factor in the region. Today, there are nearly 200,000 more cattle in the region than people. But this pales compared to the over 28 million poultry being raised in the area, mostly as broilers. There is one broiler chicken for each person in Texas. In addition, there is roughly one layer hen for every two people in the region. Much of the eastern portion of the region is actively or passively managed timber land that contributes significantly to the region's economy, including local manufacturing at sawmills and wood product manufacturing. Combined with the warehousing and distribution of products from and through the region, flooding could significantly impact the Texas economy.

The Region 2 Flood Planning Group (RFPG) is comprised of 25 volunteers who oversaw and directed the development of this plan. The RFPG held a public meeting on July 21, 2022, to ~~receive~~ approv~~al~~e ~~for~~ the submittal of the Draft Region 2 Lower Red-Sulphur-Cypress Regional Flood Plan to the TWDB by August 1, 2022 deadline. Before this meeting, the preliminary draft flood plan was made available to the public on the RFPG's website. After the meeting, the Technical Consultant Team addressed comments received and made any necessary revisions before submitting the Draft Regional Flood Plan to the TWDB and the public. The draft plan was posted on the RFPG's website and paper copies of the plan were available at three locations within the region:

- Sherman City Clerk's Office at 220 West Mulberry Street, Sherman, Texas 75090
- Mount Pleasant Public Library at 601 North Madison, Mount Pleasant, Texas 75455
- Texarkana Public Library at 600 West 3rd Street, Texarkana, Texas 75501

The draft plan was made available from August 1, 2022 to October 1, 2022. A public hearing was held on September 1, 2022, in Mount Pleasant, Texas, to present and receive feedback on the draft plan. The public had at least 30 days before and 30 days following the public hearing to provide written comments in addition to providing written and/or oral comments at the public hearing. The RFPG responded to the comments received and revised the draft plan as appropriate. On December 15, 2022, in Mount Pleasant, Texas, the final plan was ~~adopted~~ approved by the RFPG for submission to the TWDB by the January 10, 2023 deadline.

Chapters within the Plan

The TWDB developed the scope of work and technical guidelines that adhere to the legislation for each RFPG to develop its Regional Flood Plan. The plan includes 10 required chapters plus the TWDB-required tables and maps. The TWDB-required tables and maps are included in various appendices of this plan.

- **Chapter 1 (Task 1) Planning Area Description**
  Chapter 1 provides an overview of the region, including location, economics, agricultural information, social vulnerability, flood-prone areas, historical floods and associated damages, jurisdictions with flood-related authorities or responsibilities, existing infrastructure, and ongoing flood mitigation projects.
- **Chapter 2 (Tasks 2A and 2B) Flood Risk Analyses**
  This plan focuses on the 1 percent and the 0.2 percent annual chance events (ACE) for existing and future conditions. Future conditions are based on 30 years from 2022.
    - **Task 2A Existing Condition Flood Risk Analyses**
      This task estimates existing condition flood risk based on information provided by local entities and the public, as well as regional, state, and federal data sources. The best available existing condition flood risk data is stitched together to create a floodplain quilt. Data gaps are identified, as is the region's vulnerability.
    - **Task 2B Future Condition Flood Risk Analyses**
      Task 2B assess potential future flood risk considering two scenarios: a "no action" scenario in which development and population growth continue according to current trends and development incorporating floodplain regulations. Future flood risk condition considers multiple potential impacts on flood risk, such as land use, population growth, sea level change, land subsidence, and sedimentation. The RFPG developed an approach to estimate a range of potential future flood risk conditions using a hierarchy of available data sources that the TWDB approved.
- **Chapter 3 (Tasks 3A and 3B) Floodplain Management Practices and Flood Protection Goals**
  Survey questions related to floodplain management practices within the region were included in the data collection effort in Summer 2021, which the RFPG considered in its recommendations in the goals presented in Chapter 3.

- **Task 3A Evaluation and Recommendations on Floodplain Management Practices**
  The RFPG recommends eight regionwide floodplain management standards to be included in this plan. Entities are encouraged to adopt and implement these standards; however, this is not a requirement for their Flood Management Evaluations (FMEs), Flood Mitigation Projects (FMPs), and/or Flood Management Strategies (FMSs) to be included in this plan.
- **Task 3B Flood Mitigation and Floodplain Management Goals**
  The RFPG established eight overarching goals in six categories. Each goal includes at least one specific goal statement with short-term (goal year 2033) and long-term (goal year 2053) measurements. Every recommended FME, FMP, and FMS must meet at least one of these goals.

- **Chapter 4 (Tasks 4A and 4B) Assessment and Identification of Flood Mitigation Needs**
  The RFPG adopted a process to analyze flood mitigation needs and develop potentially feasible actions (FMEs, FMPs, and FMSs) to address these needs.
  - **Task 4A Flood Mitigation Needs Analysis**
    The scoring criteria to identify the areas of greatest known flood risk and knowledge gaps considers flood-prone areas that threaten life and property, current floodplain regulations, lack of inundation maps, lack of hydrologic and hydraulic (H&H) models, emergency need, existing models, previously identified projects, historical floods, previously implemented projects, and additional factors identified by the RFPG. The analysis results conclude significant knowledge gaps, as the vast majority of the region is inadequately mapped (98 percent). The areas of greatest known flood risk are primarily associated with the main cities in the region and adjacent areas.
  - **Task 4B Classification of Potential FMEs and Potentially Feasible FMSs and FMPs**
    Task 4B identifies potentially feasible actions (FMEs, FMPs, and FMSs) that might reduce or mitigate flood risk within the region. Potential actions include those identified by the RFPG in previous tasks and those provided by local entities. Planning level costs and estimated benefits are also developed for each potential action.
- **Chapter 5 (Task 5) Recommendation of Flood Management Evaluations, Flood Management Strategies, and Associated Flood Mitigation Projects**
  The RFPG established a Technical Subcommittee to review the potentially feasible actions and develop lists of FMEs, FMPs, and FMSs for the full RFPG to consider including in this plan. The RFPG applied a screening process to determine the actions for inclusion in this plan. Sixty-six FMEs, three FMPs, and 79 FMSs were considered for inclusion in the plans. Of these, 42 FMEs, three FMPs, and 38 FMSs are recommended in this Regional Flood Plan. The reduction of those numbers was mostly due to combining potential individual FMEs and FMSs within a city or region. The limited number of FMPs is due to the difficulty in providing the appropriate information and verifying that the project would have no negative impact. As a result, many potential FMPs were converted to FMEs to allow for proving the project viability in meeting the TWDB requirements.

- **Chapter 6 (Tasks 6A and 6B) Impact and Contribution of the Regional Flood Plan**
  The RFPG considers the potential impacts of the recommended FMEs, FMPs, and FMSs on upstream and downstream neighbors and adjacent regions, as well as potential impacts on the 2022 State Water Plan. Each of the recommended FMPs and FMSs has demonstrated no negative impacts on its neighboring area to be included as a recommended action.
    - **Task 6A Impacts of Regional Flood Plan**
      The recommended actions are assessed to determine anticipated flood risk reduction and socioeconomic and recreational impacts, as well as environmental, agricultural, water quality, erosion, navigation, and other impacts.
    - **Task 6B Contributions to and Impacts on Water Supply Development and the State Water Plan**
      The recommended FMPs and FMSs are assessed to determine the potential contribution to or impact on the State Water Plan. The assessment concludes that these recommended actions will not have any anticipated significant impacts on water supply, availability, or projects in the State Water Plan.
- **Chapter 7 (Task 7) Flood Response Information and Activities**
  Chapter 7 summarizes flood response preparations in the region. This chapter discusses the four phases of emergency management at the local, regional, state, and federal levels. Survey responses regarding emergency management are summarized. The TWDB requirements strictly prohibit the RFPG from analyzing or performing other activities related to planning for disaster response or recovery activities.
- **Chapter 8 (Task 8) Legislative, Administrative, and Regulatory Recommendations**
  The RFPG recommends eight legislative ideas to implement the recommended flood mitigation actions. Nine regulatory or administrative Regional Flood Planning process ideas are recommended to provide clarification or updates to statewide concerns. The RFPG recommends 18 flood planning ideas to improve future cycles of Regional Flood Planning.
- **Chapter 9 (Task 9) Flood Infrastructure Financing Analysis**
  Chapter 9 summarizes potential local, state, and federal funding opportunities that local sponsors could pursue while implementing the recommended FMEs, FMPs and FMSs. The survey results soliciting sponsor feedback on recommended actions and potential funding sources are presented.
- **Chapter 10 (Task 10) Public Participation and Plan Adoption**
  The Regional Flood Planning process is designed to be a public process. The RFPG adheres to the Texas Open Meetings Act and Freedom of Information Act, including notification requirements. The RFPG incorporates a robust public outreach plan to encourage and solicit local entities and public input. The development of this plan and its adoption is also included in Chapter 10.
- **Related Appendices**
  Appendices include the TWDB-required tables and maps, as well as supplemental details supporting information presented throughout the Regional Flood Plan.

Task 4C referred to the Technical Memorandum and Technical Memorandum Addendum that were approved by the RFPG and submitted to the TWDB in January and March 2022, respectively, to indicate significant progress in developing this plan. These two memos were significant milestones in the plan development and included outdated information. To reduce confusion, these two memos were not included in the Regional Flood Plan, although much of the content has been incorporated.

The TWDB will merge the required tables submitted by the RFPGs to develop the 2023 State Flood Plan and corresponding database. The TWDB also required specific Geographical Information System (GIS) schema to be submitted electronically as part of this plan. These files were provided directly to the TWDB.

Key Findings and Recommendations

Existing and Future Flood Risks

The Regional Flood Plan considered the 1 percent and 0.2 percent ACE. Both of these storm events were considered in the existing conditions and future conditions flood risk analyses. The future conditions scenario is assumed for 30 years from 2022.

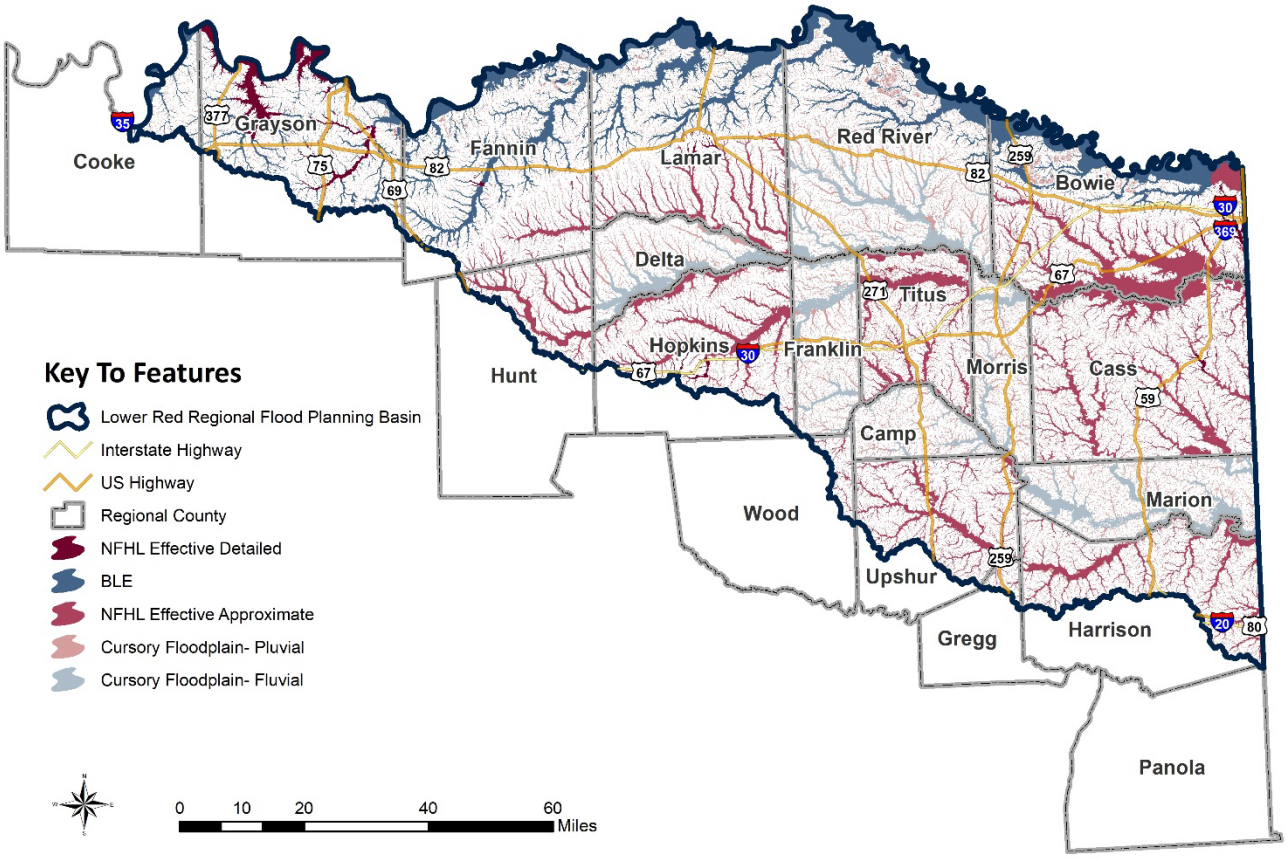
The RFPG was tasked with determining the best available data within the region. In some areas of Region 2, the RFPG could obtain local flood studies with models and maps; in others, localized studies were unavailable. The TWDB provided multiple GIS layers for Region 2 to use as a starting point in developing the floodplain quilt. The best available data for existing and future flood risks were used according to the hierarchy presented in *Table ES.1*. ~~Fathom~~ Pluvial Cursory Floodplain Data~~Floodplain data~~ was provided by the TWDB. Pluvial flooding includes flooding in shallower, smaller concentrations than typical riverine floodplains shown on Flood Insurance Rate Maps (FIRM). This expanded flood hazard limit better represents flood risks in Region 2. The resulting stitching of floodplain layers produced *Figure ES.2*, which shows the flood risks for the 1 percent and 0.2 percent floodplains. This information was applied across Region 2 to identify flood data gaps.

Most communities have older, approximate mapping in Region 2, with five counties not having any floodplain mapping. This updated floodplain quilt represents a significant improvement in understanding flood risks in Region 2; however, it is composed of approximate data and should not be used outside the purposes of flood planning.

Table ES.1 Existing and Future Conditions Flood Hazard Approach

	Best Available	→	→	→	Most Approximate
	Local Floodplain (if determined current)	**NFHL AE**	**BLE**	**NFHL A**	**FAFDS, or No FEMA**
Existing	**1% ACE:** Local Study, if provided **0.2% ACE:** Local Study, if provided	**1% ACE:** Zone AE + Pluvial Cursory Floodplain Data~~Fathom~~* **0.2% ACE:** Zone AE + Pluvial Cursory Floodplain Data~~Fathom~~*	**1% ACE:** BLE + Pluvial Cursory Floodplain Data~~Fathom~~ **0.2% ACE:** BLE + Pluvial Cursory Floodplain Data~~Fathom~~	**1% ACE:** Zone A + Pluvial Cursory Floodplain Data~~Fathom~~ **0.2% ACE:** Zone A + Pluvial Cursory Floodplain Data~~Fathom~~	**1% ACE:** Combined Pluvial & Fluvial (Replaced FAFDS with ~~Fathom~~Cursory Floodplain Data) **0.2% ACE:** Combined Pluvial & Fluvial (Replaced FAFDS with Cursory Floodplain Data~~Fathom~~)
Future	**1% ACE:** Local Study, if provided **0.2% ACE:** Local Study, if provided	**1% ACE:** Existing 500-Year **0.2% ACE:** 22-Foot Buffer of Existing 500-Year	**1% ACE:** Existing 500-Year **0.2% ACE:** 22-Foot Buffer of Existing 500' Year	**1% ACE:** Existing 500-Year **0.2% ACE:** 22-Foot Buffer of Existing 500-Year	**1% ACE:** Cursory Floodplain Data~~Fathom~~ Existing 500-Year **0.2% ACE:** 22-Foot Buffer of Existing 500-Year

Figure ES.2 Region 2 Existing Conditions Floodplain Quilt



The existing flood control infrastructure was assessed, including dams and levees. Dams and levees protect against flooding but still have associated risks. It is critical to note that not all dams are permitted or constructed for flood control purposes. Six United States Army Corps of Engineers (USACE) flood control dams are located in Region 2. The Natural Resources Conservation Service has constructed 100 flood-control reservoirs intended to primarily serve agricultural areas. The remaining 377 dams are not known to have a flood control mission, but they provide some measure of flood control within Region 2. Approximately 19 levees are located within Region 2 to provide flood protection, although only eight are accredited by the Federal Emergency Management Agency (FEMA). Maintaining these critical infrastructures is crucial to protecting life and property within Region 2.

Severe flooding can impact people, property, critical facilities, infrastructure, agricultural production, and other items in Region 2. The exposure analysis revealed that around 21,000 people within Region 2 would be displaced during a 1 percent annual chance flood event, with just over 8,000 homes impacted. The loss of transportation infrastructure was estimated, along with water and wastewater treatment facilities. The impacts of flooding on socially vulnerable populations and a community's ability to recover were also assessed in Chapter 2.

As for future condition flood risk, the RFPG considered a variety of factors that could exacerbate flood risk, including:

- future land use/land cover
- population growth
- sea level change
- land subsidence
- changes in the floodplain
- major geomorphic changes
- sedimentation

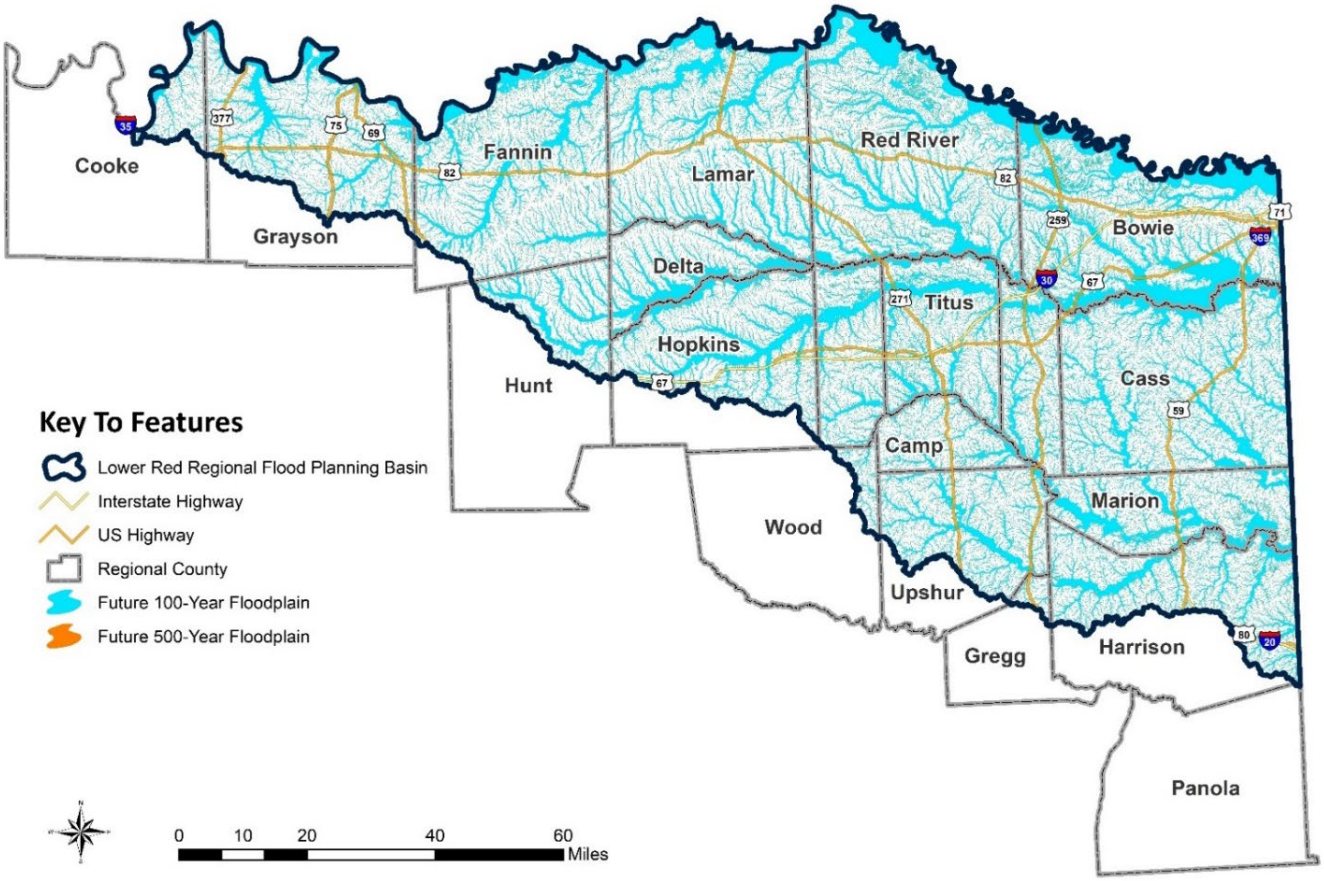
Some entities include future conditions in their mapping and modeling. However, the assumptions and methods vary from one entity to another. The few future flood studies that were available in Region 2 were incorporated into the future floodplain quilt. Where future studies were unavailable, it was necessary to develop a method of estimating future flood risks that met the TWDB requirements. A sensitivity analysis was performed based on future studies in the North Texas and North Louisiana areas. Based on this analysis, the future 1 percent annual chance floodplain could be conservatively estimated using the existing 0.2 percent annual chance floodplain. Unfortunately, no such proxy was available for the future 0.2 percent annual chance floodplain. Using the same sensitivity analysis of available future conditions studies, it was determined that the mean difference between existing and future conditions was a 22-foot offset in the floodplain width. This was applied to the existing 0.2 percent annual chance floodplain to approximate the future 0.2 percent floodplain. Due to the coarse estimating required in this process, the RFPG would have preferred not to provide future conditions floodplain data, especially for the 0.2 percent annual floodplain. *Figure ES.3* shows the future flood risk area for Region 2. The resulting future conditions 1 percent and 0.2 percent flood risk areas shown in the future floodplain quilt resulted in generally larger mapped areas than the existing conditions floodplain quilt.

The potential future flood exposure and vulnerability analysis consisted of two scenarios:

1. Estimated the structure count of buildings, critical facilities, infrastructure systems, population, and agriculture potentially exposed to flooding by overlaying the future conditions floodplain quilt developed for Region 2.
2. Estimated additional exposure and vulnerability by identifying areas of existing and known flood hazard and future flood hazard areas where development might occur within the next 30 years if the current land development practices in Region 2 continue.

If measures are not taken to mitigate future flooding, the future floodplain will impact 57 percent more structures and 72 percent more people than existing conditions while only adding 12 percent more land area. The more significant effects are seen in the more developed cities, but some impacts will occur over the entire region.

Figure ES.3 Region 2 Future Conditions Floodplain Quilt



Identification and Selection of Recommended Floodplain Management and Flood Mitigation Actions

To address the identified flood risks, the RFPG's Technical Consultant Team developed potential actions to reduce flood risk. Those actions included FMEs, FMPs, and FMSs. FMEs consist of watershed studies or additional evaluations needed to determine the viability of a project. FMPs are structural or non-structural projects to mitigate flood risk. The FMS category is intended to capture other types of solutions, such as ordinances, flood early warning systems, and buyouts.

The RFPG established a Technical Subcommittee to review the lists of potentially feasible floodplain management or flood mitigation actions and recommend to the RFPG those actions that should be considered for inclusion in this Regional Flood Plan. The subcommittee met multiple times over several months and reviewed each potential action.

The screening process removed any potential FMEs, FMPs, and/or FMSs that did not support an RFPG goal. If a potential sponsor indicated that a potential action had already been completed or was no longer a priority, the potential action was removed from further consideration. The RFPG considered potential FMEs that were most likely to result in FMPs. FME and FMS evaluations required a "No Negative Impact" determination for the action to be considered for inclusion in this plan. Cost estimates were prepared for each potential action, as appropriate. Benefit-cost ratios were also developed for potential FMPs and FMSs. In situations where the TWDB-required information was needed for a potential project to remain in the plan, the potential FMP was moved to the list of FMEs.

The Technical Subcommittee recommended the lists of FMEs, FMPs, and FMSs to the RFPG to be ultimately adopted for inclusion in this plan:

- 472 FMEs
- 3 FMPs
- 38 FMSs

Table ES.2 summarizes the types and counts of potential and recommended FMEs. *Table ES.3* includes information on each of the recommended FMPs. *Table ES.4* summarizes the types and counts of potential and recommended FMSs.

Table ES.2 Summary of Recommended FMEs

FME Types	FME Descriptions	Number of FMEs Identified	Number of FMEs Recommended	Total Cost of Recommended FMEs
Preparedness	Gauges, Barriers, Debris/Vegetation Removal, and Channelization	10	10	$3,275,000

FME Types	FME Descriptions	Number of FMEs Identified	Number of FMEs Recommended	Total Cost of Recommended FMEs
Project Planning	Previously Identified Drainage Projects and Flood Studies	23	13	$7,375,000~~15,425,000~~
Watershed Planning	FIS Studies, Watershed Studies	26	194	$26,550,000~~19,231,000~~
Other	Property Acquisition and Buyout Programs	7	5	$1,250,000~~5,818,000~~
	Total	**66**	**472**	**$38,450,000~~43,749,000~~**

Table ES.3 Summary of Recommended FMPs

FMP ID	FMP Name	FMP Type	FMP Description	Cost
023000001	Ferguson Park Improvements	Infrastructure (channels, ditches, ponds, pipes, etc.)	Improvements to existing culverts and channelization	$11,983,000
023000002	Wagner Creek	Regional Channel Improvements	Channel/Overbank Clearing	$978,000
023000003	Stream WC-2	Infrastructure (channels, ditches, ponds, pipes, etc.)	Independence Circle & Lexington Place Bridge Improvements	$540,000
			Total	**$13,501,000**

Table ES.4 Summary of Recommended FMSs

FMS Types	FMS Descriptions	Number of FMSs Identified	Number of FMSs Recommended	Total Cost of Recommended FMSs
Education and Outreach	Turn Around, Don't Drown Campaigns; Flood Safety Education	5	3	$250,000
Flood Measurement and Warning	Flood Gauges, Early Alert Systems, Flood Warning Systems	4	3	$750,000
Property Acquisition and	Infrastructure flood-proofing, Land acquisition to protect open space.	2	1	$100,000

FMS Types	FMS Descriptions	Number of FMSs Identified	Number of FMSs Recommended	Total Cost of Recommended FMSs
Structural Elevation				
Regulatory and Guidance	NFIP Participation, Stormwater Management Criteria Development, Floodplain Management Staff Acquisition, and Training	57	31	$3,400,000
Preventive Maintenance Programs	Storm Drainage Clearing, Annual Maintenance Programs	11	0	N/A
	Total	**79**	**38**	**$4,500,000**

Ultimately, the RFPG agreed with the subcommittee's recommendations and approved the recommended actions at its April 2022 RFPG meetings.

Cost of the Recommended Plan

Following the selection of recommended actions to mitigate flood risk, the RFPG's Technical Consultant Team initiated an email survey to potential sponsors regarding the recommended actions for the entity. A one-page summary was developed for each recommended action and sent to the potential sponsor. The RFPG inquired whether the sponsor agreed with the information presented and confirmed the potential sponsor's continued interest in the action. For those actions that were of interest to the sponsors, the RFPG inquired how the entity might fund the action, such as with grants, loans, stormwater utility fees, general budget, or something else. If a potential sponsor did not respond, the RFPG assumed the entity was interested and would need a grant for 100 percent of the action's cost. Overall, the estimated cost to implement the recommended FMEs, FMPs, and FMSs in this plan is $~~61~~56.5~~.8~~ million. Once all the FMEs are conducted and FMPs are developed, this number is expected to increase by more than a magnitude.

Public Participation and Outreach

In its inaugural Regional Flood Planning effort, the RFPG developed a website and an extensive public outreach plan. The website provides information on the planning effort, such as meeting notices, meeting materials, and draft chapters. Multiple data collection or surveys have been accessible through the website. In addition, Constant Contact was used to notify interested parties of upcoming meetings, surveys, and other RFPG-related activities.

Most of the RFPG meetings have been held in a hybrid fashion allowing the planning group members and the public to participate remotely. The physical meeting location has moved around Region 2 to encourage local, in-person participation.

The Draft Regional Flood Plan was presented at the September 1, 2022 RFPG meeting in Mount Pleasant, Texas. This meeting also served as the official public hearing. It provided entities and the public with the opportunity to submit oral and or written comments on the 2022 Draft Regional Flood Plan. Written comments were also accepted 30 days prior and 30 days following the public hearing. These comments were addressed and included as an appendix in the final Region 2 Lower Red-Sulphur-Cypress Regional Flood Plan submitted to the TWDB in January 2023.

Texas Administrative Code (TAC) Guiding Principles and Required Statements

Following Title 31 TAC §361.20, the draft and final Region 2 Lower Red-Sulphur-Cypress Regional Flood Plans conformed with the guidance principles established in Title 31 TAC §362.3. The RFPG performed a "No Negative Impact" assessment for each potentially feasible FMP and FMS. Those that had or appeared to have a potential negative impact were removed from further consideration and not included as recommended FMPs or FMSs. Chapter 10 includes a table of the 39 regional flood planning principles and where they are addressed in this plan.

The draft and final Region 2 Lower Red-Sulphur-Cypress Regional Flood Plans were developed following the TWDB's scope of work and Technical Guidance documents incorporating all of these principles. The requirements are discussed in Chapters 1 through 10, the appendices, and/or included in the TWDB-required tables or GIS schema.

Statements Regarding Texas Open Meetings Act (TOMA) and Public Information Act Requirements

The Region 2 Lower Red-Sulphur-Cypress Regional Flood Planning Group posted meeting notices and materials per the Texas Open Meetings Act. Meeting notices were posted on the RFPG website at https://texasfloodregion2.org/ and with the Secretary of State. Before the RFPG website development, the meetings were posted on the TWDB's website and with the Secretary of State.

The Region 2 Lower Red-Sulphur-Cypress Regional Flood Planning Group recognizes that it is subject to the Public Information Act and is required to fulfill requests for information that is not protected by another law. As such, the RFPG and the Technical Consultant Team encouraged entities to only provide information to the planning process that the entity deemed was publicly available information. As of ~~June~~ December 2022, the RFPG nor the Technical Consultant Team had received a public request for information. The Technical Consultant Team received general comments and questions regarding the Regional Flood Planning process and meetings and responded to each request. Appendix 3 includes a summary of the questions and comments received as of ~~June~~ December 2022.