

Technical Memorandum No. 1

TO: Jeff Walker DATE: November 23, 2021

Executive Administrator due to TWDB January 7,

P.O. Box 13231 **2022**

Austin, TX 78711-3231

THROUGH: Chris Brown PROJECT: TWDB Contract No.

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SUBJECT: Lower Red-Sulphur-Cypress Regional Flood Plan

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 Panning 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 RFPs and State Flood Plans will be updated on a five-year cycle.

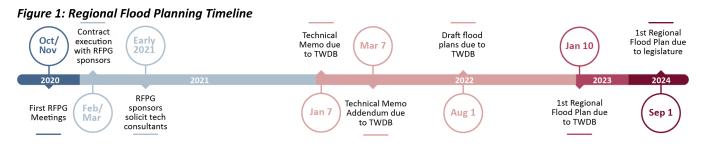


Figure 2 shows the delineation of the 15 flood planning regions, as well as the boundaries of the Lower Red-Sulphur-Cypress (Region 2) flood planning region. This region encompasses the Lower Red, Sulphur, and Cypress River Basins, with an approximate are of 9,188 square miles. Key attributes of the Lower Red-Sulphur-Cypress Flood Planning Region are presented in Figure 3.

Figure 2: Lower Red-Sulphur-Cypress Flood Planning Region

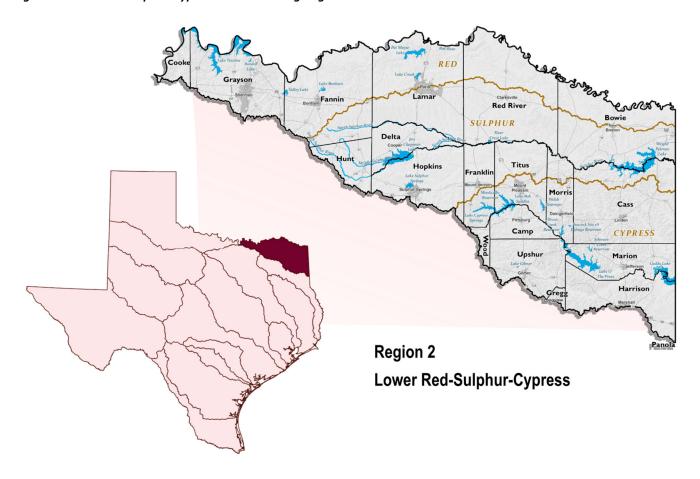
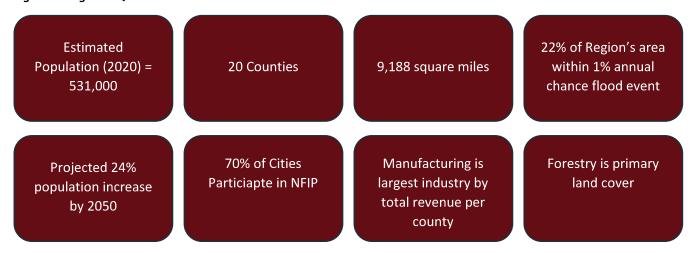


Figure 3: Region 2 Quick Facts





Who is Preparing the Regional Flood Plans?

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 considered 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 Red-Sulphur-Cypress region selected Ark-Tex Council of Governments (ATCOG) to serve as the RFPG's sponsor. ATCOG provides administrative and logistical support for RFPG meetings and required public meetings, develops and manages the RFPG's website, and administers a contract with the project technical consultant. The RFPG selected the Halff Associates Team as its technical consultant to assist with the preparation of the Lower Red-Sulphur-Cypress 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
4	(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
0	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



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 9, 2021. Per TWDB rules and guidelines, the Technical Memorandum is to be submitted to TWDB 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;
- Documentation 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. Table 6 includes details on which items are included in this Technical Memorandum 1 and which will be include din the Addendum.

Status of Flood Planning for the Lower Red-Sulphur-Cypress 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)

ATCOG as the project sponsor posts all meetings of the RFPG and its Executive Committee on the Region 2 website and on the Texas Secretary of State website, 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 2 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. Table 2 provides a summary of the RFPG meetings held to date.

Table 2: Meeting Calendar

Year	Date	Meeting	Highlights
2020	October 30	Planning Group Virtual Meeting	RFPG convening hosted by TWDB
	January 7	Planning Group Virtual Meeting	ATCOG (sponsor) hosts
	February 4	Planning Group Virtual Meeting	Tech consultant selection process approved
	March 4	Planning Group Virtual Meeting	Added additional non-voting members
	April 1	Planning Group Hybrid Meeting	Consultant Interview and Selection
	May 6	Planning Group Virtual Meeting	First meeting with Technical Consultant
	July 8 ^{A,B}	Planning Group Hybrid Meeting	Pre-planning public comment
	August 8 ^A	Planning Group Hybrid Meeting	Pre-planning public comment and began discussion of Goals and Needs
2021	September 2	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.
	October 7	Planning Group Hybrid Meeting	RFPG approves draft goals and process for identification and evaluation of potential studies and potentially feasible strategies and projects.
	November 4	Planning Group Hybrid Meeting	Discussed Tech Memo and use of additional funding
	December 9	Planning Group Hybrid Meeting	RFPG approves submittal of Technical Memorandum No. 1

APre-Planning Public Input (July and August) — 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)).

Public Virtual, In-Person and Hybrid Meetings

As noted in Table 2, two hybrid pre-planning public input sessions were conducted during RFPG meetings in mid 2021. Depending on status of in-person group gatherings and COVID-19 best practice guidelines, ATCOG 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). It is anticipated at this time, that public meetings could be inperson 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

ATCOG established the required website in January 2021 under the domain name www.texasfloodregion2.org using the Constant Contact hosting platform. The Halff Team created a cohesive visual identity for the basin. The website was also updated to provide more information and education materials about flood planning related topics. The website was updated to allow easy access for the public, with information about the planning process and updates on RFPG meetings. To complement the more in-depth information gathered by the data collection

^BJuly 8, 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 various locations in northeast Texas, 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.



effort, the website provided a brief survey for site visitors to gain a broad understanding of regional goals and priorities.

As of December 1, 2021, over 400 subscribers have registered (on their own or by the consultant team) on the website to receive notifications and information pertaining to the regional planning activities. Table 3 provides additional website analytics.

Table 3: Website Analytics

Date	Total Visits	Unique Visitors	Page Views
June-July 2021	277	86	395
June-November 2021	1,525	688	2,137

Direct Email Blasts

The RFPG uses Constant Contact to communicate to public and community stakeholders. An email contact list has been developed for a targeted audience that now has 419 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
- Halff technical consultant team

Eleven email blasts have been sent to audiences between June – December 2021, with a click-to-open average rate of 25 percent. For perspective, a click-to-open average rate between 20-30 percent is generally considered a good response goal.

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 Red-Sulphur-Cypress region. This required information and associated draft Chapter 1 outline include:

Attributes of the Lower Red-Sulphur-Cypress Region

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

Assessment of Existing Flood Infrastructure

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

Proposed and Ongoing Flood Mitigation Activities

- Current flood mitigation activities; and
- Projects under construction



The data and information collection requirements of Task 1 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 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 coordinators) and the public through an online survey. The Region 2 Data Collection Survey Tool and Interactive Webmap included over 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 2 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 survey include 25 percent of the region's counties (5 counties), 27 percent of the region's communities (23 communities), one river authority, 3 utility districts, and two councils of governments.

Task 1 is substantially complete. The results have been compiled and are presented in a draft of Chapter 1 of the RFP.

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 "sewn" 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 TWDB provided cursory floodplain dataset, 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.

Region 2 intends to develop the floodplain quilt using the best available data based on the following prioritization:

1. Local Detailed Studies – Local detailed studies will be included only if they are city/county-wide studies completed to FEMA or TWDB standards. To date, no such studies have been provided that have not already been incorporated into FEMA Zone AE studies.



- 2. FEMA Zone AE Detailed Studies These are limited to most of Grayson County and the larger municipalities in the area. Some cities, such as Sherman, Paris, and Texarkana have previously incorporated their own detailed studies.
- 3. FEMA Zone A Approximate Studies Zone As make up most of the floodplain mapping that is available in the region.
- 4. Base Level Engineering (BLE) Where available, BLE will be utilized. It is expected that, for this first round of the Regional Flood Plan, BLE will only be available in the Lower Red Basin. This will be used in counties with no current FEMA floodplain mapping or to extend the limits of the Zone A/AE floodplain.
 - a. 0.2% AC Floodplain Where available, the BLE 0.2% AC floodplain will be used where no 0.2% AC Zone X floodplain exists, which is most of the region.
- 5. Fathom Cursory Floodplain Dataset
 - a. Fluvial Fathom fluvial (riverine/channel flooding) data will be used where no FIRM or BLE data is available.
 - b. Pluvial Fathom pluvial (upland/urban flooding) data is being evaluated for use in supplementing all floodplain data to extend into upland areas (drainage areas less than one square mile) not traditionally covered by FEMA floodplain maps.

The methodology for assembling this quilt is under development now that both the BLE and Fathom became available in late October.

Future flood risks are only available in limited areas of the Region. In particular, Region 2 intends to use the current 0.2% AC (500-year) floodplain as the basis for future conditions 1% ACE floodplain in all locations where the 0.2% AC floodplain is available (whether from FEMA, Fathom, or other source); otherwise, the existing 1% AC floodplain will be utilized as the future 1% ACE. The Future 0.2% AC floodplain is mostly unavailable and will be identified as a data gap.

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 us practices may increase existing and future flood risk;
- Assessment of how future flood risk may change over time; and
- Consideration of 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 with a preliminary draft of Chapter 3 under review by the technical consultant team. This includes a substantially complete draft of TWDB-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 Red-Sulphur-Cypress region was also obtained through the *Region 2 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 and is included as *Attachment 3* to this Technical Memorandum. This table of goals was approved by the Lower Red-Sulphur-Cypress RFPG at its October 7, 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, most of the draft goals include specific quantifiable targets or performance measures. These may be revised as work on other related tasks progress, most importantly, the work to be performed under Task 5 - Recommendation of FMEs and FMSs and associated FMPs.

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 the Task 2 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. The approach developed for Task 4B was approved by the RFPG at the October 7, 2021 meeting and is included in Attachment 4. As of November 2021, flood related studies and plans have been collected, compiled, and initially screened utilizing 19 previous floodplain studies, 14 hazard mitigation plans, three drainage master plans, one flood protection study, 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.

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

The submittal of Technical Memorandum No. 1 marks the conclusion of the data collection phase of the regional flood planning process. However, as noted previously, the substantial completion of Tasks 2A/B and 4A/B are underway and will be documented in the Technical Memorandum Addendum and submitted to TWDB by March 7, 2022. In terms of the schedule for the plan development phase of the process, the driver is the requirement for the RFPG to adopt and submit an initial draft Regional Flood Plan to TWDB by August 1, 2022. Table 4 below presents an overview of the projected work to be completed and the general sequence of actions the RFPG will encounter during this next phase of the process.



Table 4: Projected Progress by Task

Task / D	Description	Progress as of November 22, 2021	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 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 will be 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 may be refined 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 9, 2021 for submittal of Technical Memorandum No. 1 to TWDB by January 7, 2022. Substantial completion of draft the Technical Memorandum Addendum 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	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



Task / [Description	Progress as of November 22, 2021	Projected Progress		
			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 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 Red-Sulphur-Cypress region.

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

TWDB provided a list of 148 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	86	60
County	20	16
Council of Governments	4	N/A
River Authority	3	N/A
Water Districts	3	N/A
Water Supply & Utility Districts (MUDs, FWSDs, MWDs, SUDs)	17	N/A
Flood Control Entities (WCIDs, LIDs)	10	N/A
Other	5	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 23 percent of the entities with potential flood related authority, provided at least some measure of response at varying levels of detail in the flood planning process via the *Region 2 Data Collection Survey Tool and Interactive Webmap*. 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 2 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 avaliable or presumed avaliable. 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 Red-Sulphur-Cypress region.

4C.1c, 4C.1d, and 4C.1e - Lists, maps, and geodatabase of existing and future 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 Red-Sulphur-Cypress RFPG has spent a significant amount of time 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 Red-Sulphur-



Cypress 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 Red-Sulphur-Cypress 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 were adopted by the RFPG for incorporation in Chapter 3 but may be revised as the planning process progresses, 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 September 2, 2021 RFPG meeting. Subsequently, at the October 7, 2021 meeting, the RFPG reviewed and discussed the proposed process, accepted public comment, and 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

No FMSs or FMPs have been determined to be infeasible at this time. This determination will primarily be performed under Task 5.

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		A general description of the location,	Technical Memo	ExFldInfraPol	Submit on January 7, 2022.
4	Existing Infrastructure	condition, and functionality of existing natural flood mitigation features and constructed major flood infrastructure	Technical Memo	ExFldInfraLn	Submit on January 7, 2022.
5		within the FPR.	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 Addendum.
8*	Flood Mapping Gaps	Gaps in inundation boundary mapping.	Technical Memo	Fld_Map_Gaps	Submit on March 7, 2022 along with Technical Memorandum Addendum.

File No.	Item Name	Description	Submittal Milestone	Feature Class Name	Submittal Deadline Notes
9*		Develop high-level, region- wide, and largely GIS-based existing condition flood exposure analyses using the	Technical Memo	ExFldExpPol	Submit on March 7, 2022 along with Technical Memorandum Addendum.
10*	Existing Exposure Future Flood Hazard Future Exposure Existing Floodplain Management Practices Goals Streams Flood Management Evaluations Flood Mitigation Projects	information identified in the flood hazard analysis to identify who and what might be harmed within the region for,	Technical Memo	ExFldExpLn	Submit on March 7, 2022 along with Technical Memorandum Addendum.
11*		at a minimum, both 1.0% annual chance and 0.2% annual chance flood events.	Technical Memo	ExFldExpPt	Submit on March 7, 2022 along with Technical Memorandum Addendum.
12*		Combines the Exposure Poly, Line, and Point data into a single master layer, also includes Vulnerability data.	Technical Memo	ExFldExpAll	Submit on March 7, 2022 along with Technical Memorandum Addendum.
13*		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 Addendum.
14*		Perform future condition flood exposure analyses using the information identified	Technical Memo	FutFldExpPol	Submit on March 7, 2022 along with Technical Memorandum Addendum.
15*		in the flood hazard analysis to identify who and what might be harmed within the region for, at a minimum, both 1.0%	Technical Memo	FutFldExpLn	Submit on March 7, 2022 along with Technical Memorandum Addendum.
16*		annual chance and 0.2% annual chance flood events.	Technical Memo	FutFldExpPt	Submit on March 7, 2022 along with Technical Memorandum Addendum.
17*		Combines the Exposure Poly, Line, and Point data into a single master layer, also includes Vulnerability data.	Technical Memo	FutFldExpAll	Submit on March 7, 2022 along with Technical Memorandum Addendum.
18	Floodplain Management	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	Management	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	Mitigation	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*		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.

File No.	Item Name	Description	Submittal Milestone	Feature Class Name	Submittal Deadline Notes
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, 4C.1e, 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



Attachment 1

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

DRAFT FOR PUBLIC REVIEW

	Elecatelaie Management				Floodplain Management Louis of Enforcement of		
Entity	Floodplain Management Regulations (Yes/ No/ Unknown)	Adopted Minimum Regulations Pursuant to Texas Water Code Section 16.3145? (Yes/ No)		Higher Standards Adopted (Yes/ No)	Floodplain Management Practices (Strong/Moderate/Low/None (High/ Moderate/ Low/ None)	Existing Stormwater or Drainage Fee (Yes/No)	Web Link to Entity Regulations
	Unknown)	16.3145? (Yes/No)) (High/ Moderate/ Low/ None)		
Counties							
Bowie Camp	Unknown	Unknown	Yes No		None None		http://www.co.bowie.tx.us/page/bowie.OfficeofEmergencyManagement
Cass	Yes	Yes	Yes Yes		None Low		http://www.co.cass.tx.us/page/cooke.Ordinances https://www.co.cooke.tx.us/page/cooke.Ordinances
Cooke Delta	Yes Yes	Unknown	No No		None		https://www.deltacountytx.com/publicnotices.html
Fannin Franklin	Yes Yes	Yes	Yes Yes	Yes	Strong None	No	http://www.oc.famin.ts.us/page/famin.developmentservies https://www.oc.famin.ts.us/page/famin.developmentservies
Grayson	Yes	Yes	Yes	Yes	Strong	No	https://www.co.grayson.tx.us/page/dev.home
Gregg Harrison	Yes Yes		Yes Yes		None Low		https://www.co.gregg.tx.us/sites/default/files/Departments/Sheriff/2018GreggCountyHMAP31419.pdf http://harrisocuntyteas.org/cod-bridge/
Hopkins	Yes	Yes	Yes	Yes	Moderate	No	http://www.hopkinscountytx.org/page/hopkins.EnviromentalServices
Hunt Lamar	Yes Unknown	Yes Unknown	Yes No	Yes	Moderate None	No	https://www.huntcounty.net/pase/hunt.countydey
Marion Morris	Yes Yes		Yes		None None		https://www.co.marion.or.us/PW/EmergencyManagement/Documents/Marion_HMP_Volume%20III_07112017.pdf
Panola Red River	Yes	Yes	Yes Yes		None		ntps://www.co.marm.tx.us/page/morrs.emergencyManagement.cordinator
Red River Titus	Yes Yes	Unknown Yes	No Yes	Yes	Strong None	No	https://www.co.red-fiver.tx.us/upload/page/9385/docs/Hazard%20Mitipation%20Plank/20Draft.pdf
Upshur	Yes	Yes	Yes	Yes	Strong		https://www.upshurcounty.org/departments/addressing. and mapping building permits floodplain management.php
Wood Cities/Towns	Yes	Yes	Yes		None		https://www.mywoodcounty.com/page/emc
Annona Atlanta	Unknown	Unknown	No	Yes	Moderate		
Atlanta		Yes	Yes Yes			No	https://22.franklinlegal.net/franklin/728rowser2.html?showset=atlantase5
Avinger Railey	Unknown Yes	Yes	No Yes	Yes	Moderate	No	
Bailey Bells	Yes	Unknown	No				https://mg1.wsimg.com/blobby/go/85aa83a8-752b-4f51-b1e0-5rfa4fe19721/downloads/Belis/202-oning/k2/Q0rdinance/x20Manual/k2/03102020.pdf?ver=1626443294211
Bloomburg Blossom	Yes Yes		Yes Yes	-			
Bogota	Yes	Yes	Yes				
Bonham Callisburg	Yes	Yes	Yes Yes	Yes	Strong Strong	No	https://j2.franklinlegal.net/franklin/228rowser2.html?showset*bonhamset
Campbell	Unknown	Unknown	No				the form the finished and the first
Clarksville Commerce	Yes	Yes	Yes Yes		Strong None		https://www.chyofdarksville.com/DocumentCenter/Niew/S035/Stormwater-Management-Manual-20707bddid= https://www.chgov.com/home/showdocument?id=1816
Como Cooper	Yes Unknown	Yes	Yes	Yes Yes		No No	
Daingerfield	Yes	Yes	Yes				https://fibrary.municode.com/ts/fainserfield/codes/rode_of_ordinances/modeld=PTIICOOR_CH18FI
De Kalb Denison	Yes Yes	Unknown Yes	No Yes	Yes	Strong	No	https://dekaldu.cog/code-enforcement https://dekaldu.cog/code-enforcement https://dekaldu.cog/code-enforcement https://dexaldu.cog/code-enforcement https://dexaldu.cog/code-enforcement
Deport	Yes	Yes	Yes				
Detroit Dodd City	Yes Unknown		Yes No	Yes		NO	
Domino Dorchester	Yes Unknown	Yes Unknown	Yes				
Douglassville	Unknown	Unknown	No				
East Mountain Ector	Unknown Yes		No Yes				
Gilmer	Yes	Yes	Yes		Low		https://library.municode.com/tx/gilmer/codes/code of ordinances?nodeid=PTIICOOR_CH42FLPRPR
Honey Grove Hooks	Yes Yes	Yes	Yes Yes	Yes		No	
Howe	Yes Yes	Yes	Yes Yes				
Hughes Springs Jefferson	Yes	Yes	Yes		Low		https://library.municode.com/tx/jefferson/codes/code of ordinances?nodeld=COOR_CH46FL
Knollwood Ladonia	Unknown Yes		No Yes				
Leary	Yes	Yes	Yes				
Leonard Linden	Yes Yes		Yes Yes		Low		https://linden.municipakodeonline.com/book/ttype-ordinances/insme=11_FLOOD_DAMAGE_PREVENTION
Lone Star	Yes	Yes	Yes				https://longviewtexas.gov/2832/Floodplain-Administrator
Longview Marietta	Yes Unknown	Unknown	Yes No	Yes		No	
Marshall Maud	Yes Yes		Yes Yes	Yes		No	https://ibbrary.municode.com/ts/marshall/codes/code of ordinances?nodeid=PTIICOOR_CHZBU_ARTIVFLDAPR
Miller's Cove	Yes	Yes	Yes				
Mount Pleasant Mount Vernon	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Low	No Yes	https://code/brary.amlegal.com/codes/mtpleasanttv/latess/mtpleasantt vs/0-0-0-26869 https://library.municode.com/ts/mount_vernon/codes/code_of_ordinances/nodeld=COOR_CHSBUCDRFAC_ARTIIIFLDAPR
Naples Nash	Yes	Yes	Yes	Yes		No	
Nash New Baston	Yes	Yes	Yes Yes		Low		https://library.municode.com/tx/new boston/codes/code of ordinances/nodeld=COOR CH8FLPRCO
Neylandville Omaha	Unknown Yes	Unknown	No Yes	-			
Ore City	Yes	Yes	Yes		Strong		https://library.municode.com/rs/ore_city/codes/code_of_ordinances?nodeld=CH10BUBURE_ARTIVELDAPR
Paris Pecan Gap	Yes Unknown	Yes Unknown	Yes No	Yes	Strong	No	https://i2.franklinlegal.net/franklin/228rowser2.html?showset-parisset
Pittsburg	Yes	Yes	Yes		Low		https://r2codes.franklinlegal.net/franklin/22Rcowser2.html?showset=pittsburgset
Pottsboro Queen City	Yes Yes	Yes		Yes		No	
Ravenna	Unknown	Unknown	No No			No	
Red Lick Redwater	Unknown Yes	Yes	Yes			INO	
Reno (Lamar) Rocky Mound	Yes Unknown		Yes No				
Raxton	Yes	Yes	Yes	Yes		No	
Sadler Savoy	Unknown Yes	Unknown	No Yes				
Scottsville	Unknown	Unknown	No				
Sherman Southmayd	Yes Yes	Yes Yes	Yes Yes		Strong	Yes	https://22.codes.frankfiniegal.net/frankfin/72/krowser/2.html/2showset-shermansej
Sulphur Springs	Yes	Yes	Yes	Yes	Strong	No	http://www.sulphurspringsb.org/business resources/engineering.php
Sun Valley Talco	Unknown Unknown	Unknown	No No				
Texarkana Tira	Yes Yes	Yes	Yes Yes	Yes	Moderate	No	https://library.municode.com/tx/texarkana/codes/code of ordinances?nodeld=PTIIII.ADECO_CH110FLDAPR
Toco	Unknown	Unknown	No				
Tom Bean Trenton	Yes Yes	Unknown Yes	No Yes	 			https://tombeantx.gov/government/ordinances/
Uncertain	Yes	Yes	Yes				https://codelibrary.amlegal.com/codes/wakevillagetx/latest/wakevillage_tx/0-0-0-3943
Wake Village Waskom	Yes Yes	Yes Yes	Yes Yes	Yes	Strong	No	
Whitesboro	Yes	Unknown	No		7		https://codeibrary.amlogal.com/codes/whitesboro/latest/whitesboro tx/0-0-0-5159 https://library.municode.com/tx/whitewright/codes/code of ordinances/nodeid=COOR CH14EN ARTIFI.PRCO
Whitewright Windom	Yes Yes	Yes	Yes Yes		Strong		INTO SATISFACE OF THE PROPERTY
Winfield Winnsboro	Unknown	Unknown	No				
Winnsboro Wolfe City	Yes Unknown	Ves Unknown	Yes No				

1 of 1

LOVER RID-SUD-PURC-SPRESS REGIONAL FLOOD PLAN



Attachment 2

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

Study ID	RFPG No. RFPG Name	Study Name	Description Counties Cities HUC8s	HUC12s Watersheds Study Sponsor ¹	Study Date	Study Conditions ²	Frequencies Studied ³	Hydrology Models Available ⁴	Hydraulic Models Available ⁴	How Was Study Used in RFP ⁵	FEMA Status ⁶	Can Study be Used in Evaluati		Most Valuable Model?
	2 Lauren Dard Carlotter Communication	Contraction FIG.	Cooke	FEMA	1/16/2008		1% AC, 0.2% AC		Presumed Yes	i i	Included in FIS	Minimally	FMSs?	
48097CV000A 48085CV001B	2 Lower Red Sulphur Cypress 2 Lower Red Sulphur Cypress	Cooke County FIS Grayson County FIS	Grayson	FEMA	6/7/2017		1% AC, 0.2% AC 1% AC, 0.2% AC	Presumed Yes Presumed Yes	Presumed Yes Presumed Yes	Mapping Mapping	Included in FIS	Minimally	Possibly Possibly	
48085CV002B	2 Lower Red Sulphur Cypress	Grayson County FIS	Grayson	FEMA	6/7/2017		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48085CV003B	2 Lower Red Sulphur Cypress	Grayson County FIS	Grayson	FEMA	6/7/2017	Existing	1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48085CV004B	2 Lower Red Sulphur Cypress	Grayson County FIS	Grayson	FEMA	6/7/2017		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48147CV000A	2 Lower Red Sulphur Cypress	Grayson County FIS	Grayson	FEMA	2/18/2011		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48181CV000A	2 Lower Red Sulphur Cypress	Grayson County FIS	Grayson	FEMA FEMA	9/29/2010		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48147CV000A 48181CV000A	2 Lower Red Sulphur Cypress 2 Lower Red Sulphur Cypress	Fannin County FIS Fannin County FIS	Fannin Fannin	FEMA	2/18/2011 9/29/2010		1% AC, 0.2% AC 1% AC. 0.2% AC	Presumed Yes Presumed Yes	Presumed Yes Presumed Yes	Mapping	Included in FIS	Minimally Minimally	Possibly	
48085CV001B	2 Lower Red Sulphur Cypress 2 Lower Red Sulphur Cypress	Hunt County FIS	Hunt	FEMA	6/7/2017		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping Mapping	Included in FIS	Minimally	Possibly	-
48085CV002B	2 Lower Red Sulphur Cypress	Hunt County FIS	Hunt	FEMA	6/7/2017		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48085CV003B	2 Lower Red Sulphur Cypress	Hunt County FIS	Hunt	FEMA	6/7/2017		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48085CV004B	2 Lower Red Sulphur Cypress	Hunt County FIS	Hunt	FEMA	6/7/2017	Existing	1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48231CV000A	2 Lower Red Sulphur Cypress	Hunt County FIS	Hunt	FEMA	1/6/2012		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	-
48397CV000A	2 Lower Red Sulphur Cypress	Hunt County FIS	Hunt	FEMA	9/26/2008		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48277CV000A 48223CV000A	2 Lower Red Sulphur Cypress	Lamar County FIS	Lamar	FEMA FEMA	8/16/2011 3/17/2011		1% AC, 0.2% AC	Presumed Yes Presumed Yes	Presumed Yes Presumed Yes	Mapping	Included in FIS Included in FIS	Minimally	Possibly	
48499CV000A	2 Lower Red Sulphur Cypress 2 Lower Red Sulphur Cypress	Hopkins County FIS Hopkins County FIS	Hopkins Hopkins	FEMA	9/3/2010		1% AC, 0.2% AC 1% AC, 0.2% AC	Presumed Yes Presumed Yes	Presumed Yes Presumed Yes	Mapping	Included in FIS	Minimally Minimally	Possibly	
48223CV000A	2 Lower Red Sulphur Cypress 2 Lower Red Sulphur Cypress	Wood County FIS	Wood	FEMA	3/17/2011		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping Mapping	Included in FIS	Minimally	Possibly	
48379CV000A	2 Lower Red Sulphur Cypress	Wood County FIS	Wood	FEMA	4/17/2012		1% AC. 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48499CV000A	2 Lower Red Sulphur Cypress	Wood County FIS	Wood	FEMA	9/3/2010		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48449CV000A	2 Lower Red Sulphur Cypress	Titus County FIS	Titus	FEMA	9/29/2010		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48183CV001A	2 Lower Red Sulphur Cypress	Upshur County FIS	Upshur	FEMA	9/3/2014		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48183CV002A	2 Lower Red Sulphur Cypress	Upshur County FIS	Upshur	FEMA	9/3/2014		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48459CV000A	2 Lower Red Sulphur Cypress	Upshur County FIS	Upshur	FEMA FEMA	10/19/2010		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
480263V000 48183CV001A	2 Lower Red Sulphur Cypress 2 Lower Red Sulphur Cypress	Gregg County FIS Gregg County FIS	Gregg	FEMA	8/16/1996 9/3/2014		1% AC, 0.2% AC 1% AC, 0.2% AC	Presumed Yes Presumed Yes	Presumed Yes Presumed Yes	Mapping	Included in FIS Included in FIS	Minimally Minimally	Possibly Possibly	
48183CV002A	2 Lower Red Sulphur Cypress 2 Lower Red Sulphur Cypress	Gregg County FIS	Gregg Gregg	FEMA	9/3/2014		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping Mapping	Included in FIS	Minimally	Possibly	
48203CV000A	2 Lower Red Sulphur Cypress	Gregg County FIS	Gregg	FEMA	9/3/2014		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48401CV000A	2 Lower Red Sulphur Cypress	Gregg County FIS	Gregg	FEMA	9/29/2010		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	-
48459CV000A	2 Lower Red Sulphur Cypress	Gregg County FIS	Gregg	FEMA	10/19/2010	Existing	1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48037CV000B	2 Lower Red Sulphur Cypress	Bowie County FIS	Bowie	FEMA	12/21/2017		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48067CV000A	2 Lower Red Sulphur Cypress	Cass County FIS	Cass	FEMA	4/3/2012		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48183CV001A	2 Lower Red Sulphur Cypress	Harrison County FIS	Harrison	FEMA FEMA	9/3/2014		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping	Included in FIS	Minimally	Possibly	
48183CV002A 48203CV000A	2 Lower Red Sulphur Cypress 2 Lower Red Sulphur Cypress	Harrison County FIS Harrison County FIS	Harrison Harrison	FEMA	9/3/2014		1% AC, 0.2% AC 1% AC, 0.2% AC	Presumed Yes Presumed Yes	Presumed Yes Presumed Yes	Mapping	Included in FIS Included in FIS	Minimally Minimally	Possibly Possibly	
48459CV000A	2 Lower Red Sulphur Cypress	Harrison County FIS	Harrison	FEMA	10/19/2010		1% AC, 0.2% AC	Presumed Yes	Presumed Yes	Mapping Mapping	Included in FIS	Minimally	Possibly	-
50001	2 Lower Red Sulphur Cypress	Johnson Woods Drainage Improviements	Existing conditions flood study performed by Hayter Engineering, Inc. for City of Paris Lamar Paris	City of Paris	10/27/2016		1% AC. 0.2% AC	Yes	Yes			Yes	Yes	
			Flood study performed by Cobb		,								177	
S0002	2 Lower Red Sulphur Cypress	Big Sandy Creek Tributary 4 & 6	Fendley for City of Paris Lamar Paris	City of Paris	3/24/2017	Existing	1% AC	Yes	Yes	Projects		Yes	Yes	
			Section IV Drainage Study based on											
			Drainage Manster Plan prepared in											
50003	2 Lower Red Sulphur Cypress	City of Paris Comprehensive Plan	1993 Lamar Paris Prepared by Hayter Engineering,	City of Paris	2/26/2014	Existing	1% AC	No	No	Projects	<u> </u>	Minimally	Minimally	
50004	2 Lower Red Sulphur Cypress	City of Paris Drainage Master Plan	Inc Lamar Paris	City of Paris	1/1/1993	Evicting	1% AC	No	No	Projects		Minimally	Minimally	
50004	L cover ned Suprar Cypress	erry of Faris Brainage Master Fran	inc.	City Of Faits	1/1/1555	LAISTING	1707.0	7.0	10	110,000		Triuminony	iviiiiiiuiy	
			Prepared by Hayter Engineering,											
S0005	2 Lower Red Sulphur Cypress	City of Cooper Storm Drainage Study	Inc. to establish storm drain needs. Delta Cooper	City of Cooper	9/1/2017	Both	10% AC	No	NO	Projects		Minimally	Minimally	
		City of Texarkana City-wide Flood Protection	Prepared by Halff Associates, Inc.											
50006	2 Lower Red Sulphur Cypress	Planning Study	udner a TWDB Contract Bowie Texarkana	City of Texarkana, TWDB	1/31/2012	Both	1% AC, 0.2% AC	Yes	Yes	Mapping, Projects	Included in FIS	Yes	Yes	
S0007	2 Lower Red Sulphur Cypress	City of Sherman	Grayson Sherman		1		 	Yes	Yes	Mapping, Projects	Included in FIS	Yes	Yes	
50008	2 Lower Red Sulphur Cypress	USACE Lower Red Studies	CWMS forecasting and dam safety	USACE		Both		Yes	Yes	Possible Evaluations	Not included in FIS	Possibly	Possibly	
	active transmission of his and		and	331.100			1	1						
			CWMS forecasting and dam safety,				1							
S0009	2 Lower Red Sulphur Cypress	USACE Sulphur River Studies	Wright Patman reallocation study	USACE		Both		Yes	Yes	Possible Evaluations	Not included in FIS	Possibly	Possibly	
		L				L .	1	L.	L.	L				
50010	2 Lower Red Sulphur Cypress	USACE Cypress River Studies	CWMS forecasting and dam safety	USACE	-	Both	-	Yes	Yes	Possible Evaluations	Not included in FIS	Possibly	Possibly	
S0011	2 Lower Red Sulphur Cypress	SRBA Sulphur River Basin Instream Flow Study		SRBA			1	Presumed Yes	Presumed Yes	Possible Evaluations	Not included in FIS	Possibly	Possibly	
55011	2 cower ned Sulpitur Cypress	Short Sarphur hiver basin histream Flow Study	 	3000	+		 	r resulted tes	r counted res	, ossible Evaluations	THE INCIDENTIFIE	i ossibly	, osnety	-

1 of 1 LOWER RED-SULPHUR-CYPRESS REGIONAL FLOOD PLAN

^{1:} Sponsors could include FEMA, TWDB, City, County, Developer, etc.
2: Study Conditions would be Existing, Future, or Both
3: Frequencies could be 50% AC, 1%AC, 0.2% AC, etc.
4: Options include: Yes, Presumed Yes, Presumed No, No, Unkown
5: Options could include: Mapping, Validation, Considered, but not used; FMP, FMS, or FME Development and Eval; etc.
6: Options could include: Included in FIS, FIS in Progress, Completed LOMC, LOMC in Progress, LOMC to be Pursued, Local Study Only



Attachment 3

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

DRAFT FOR PUBLIC REVIEW

Goal ID	RFPG No.	RFPG Name	Goal	Term of Goal	Target Year	Applicable To	Overarching Goal	Associated Goal IDs
1001	For each planning cycle, hold 3 public outreach and education activities (in multiple locations within the region) to improve awareness of flood	Short Term (10 year)	2033	Entire RFPG	N/A	Document number of meetings per planning cycle. Keep records of sign in sheets and meeting minutes.	Educate public on risk	1002
1002	For each planning cycle, hold 3 public outreach and education activities (in multiple locations within the region) to improve awareness of flood	Long Term (30 year)	2053	Entire RFPG	N/A	Document number of meetings per planning cycle. Keep records of sign in sheets and meeting minutes.	Educate public on risk	1001
2001	Support the development of a community coordinated warning and emergency response program (including flood gauges) that can detect the flood threat and provide timely warning of impending flood danger-ldentify potential areas where flood warning systems would be beneficial.	Short Term (10 year)	2033	Entire RFPG	Areas without flood warning systems would still be at risk of inadequate warning until implemented.	Complete study and provide report with identified areas.	Protect against loss of life and property.	2002
2002	Support the development of a community coordinated warning and emergency response program (including flood gauges) that can detect the flood threat and provide timely warning of impending flood danger Implement a minimum of 1 flood warning system.	Long Term (30 year)	2053	Entire RFPG	Other areas that would benefit from flood warning systems would remain at risk of inadequate warning.	Number of implemented flood warning system.	Protect against loss of life and property.	2001
3001	Increase the coverage of flood hazard data by completing studies to reduce areas identified as having current gaps in flood mapping by	Short Term (10 year)	2033	Entire RFPG	Flood risk uncertainty remains for 75% of current areas with gaps in flood mapping.	Updates to flood mapping and compare to mapping coverage shown on 2023 Regional Flood Plan.	Protect against loss of life and property.	3002
3002	Increase the coverage of flood hazard data by completing studies to reduce areas identified as having current gaps in flood mapping by	Long Term (30 year)	2053	Entire RFPG	Flood risk uncertainty remains for 10% of current areas with gaps in flood mapping.	Updates to flood mapping and compare to mapping coverage shown on 2023 Regional Flood Plan.	Protect against loss of life and property.	3001
4001	Reduce the percentage of communities that do not have floodplain standards that meet or exceed the NFIP minimum standards by 25%.	Short Term (10 year)	2033	Entire RFPG	Risk to existing structures is not reduced; Risk to new construction in non-	Number of entities participating in NFIP; number of entities with equivalent standards.	Protect against loss of life and property.	4002
4002	Reduce the percentage of communities that do not have floodplain standards that meet or exceed the NFIP minimum standards by 90%.	Long Term (30 year)	2053	Entire RFPG	Risk to existing structures is not reduced; Risk to new construction is minimized.	Number of entities participating in NFIP; number of entities with equivalent standards.	Protect against loss of life and property.	4001
4003	Support the development of minimum stormwater infrastructure design standards applicable across the FPR by the creation of an	Short Term (10 year)	2033	Entire RFPG	Risk to existing structures is not reduced; Risk to new construction in non-	Completion of stormwater infrastructure design standards document.	Protect against loss of life and property.	4004
4004	Support the development of minimum stormwater infrastructure design standards applicable across the FPR by helping local	Long Term (30 year)	2053	Entire RFPG	Risk to existing structures is not reduced; Risk to new construction is minimized.	Document efforts by RFPG in assisting local governments.	Protect against loss of life and property.	4003
5001	Reduce the number of NFIP repetitive-loss properties by 10%.	Short Term (10 year)	2033	Entire RFPG	90% of repetitive loss structures would remain at risk	Number of repetitive loss properties.	Protect against loss of life and property.	5002
5002	Reduce the number of NFIP repetitive-loss properties by 50%.	Long Term (30 year)	2053	Entire RFPG	50% of repetitive loss structures would remain at risk	Number of repetitive loss properties.	Protect against loss of life and property.	5001
5003	Identify at least one (1) non-structural flood mitigation project in the Region.	Short Term (10 year)	2033	Entire RFPG	No change in flood risk	Number of non-structural flood mitigation projects identified in the Regional Flood Plan.	Protect against loss of life and property.	5004
5004	Identify at least three (3) non-structural flood mitigation projects in the Region.	Long Term (30 year)	2053	Entire RFPG	Project areas remain at risk for events that exceed the project's level of service (1%	Number of non-structural flood mitigation projects identified in the Regional Flood Plan.	Protect against loss of life and property.	5003
6001	Improve the level of service for 10% of vulnerable roadway segments and low water crossings located within the existing and future 1%	Short Term (10 year)	2033	Entire RFPG	, , , , , , , , , , , , , , , , , , , ,	Take inventory of existing structures and report number of improved structures.	Protect against loss of life and property.	6002
6002	Improve the level of service for 50% of vulnerable roadway segments and low water crossings located within the existing and future 1%	Long Term (30 year)	2053	Entire RFPG	, ,	Take inventory of existing structures and report number of improved structures.	Protect against loss of life and property.	6001
6003	Repair, rehabilitate, or replace 10% of aged stormwater infrastructure that is at high risk of failure and where failure would increase flood	Short Term (10 year)	2033	Entire RFPG	Flood risk will remain unchaged for 90% of stormwater infrastructure at high risk of	Take inventory of existing structures and report number of improved structures.	Protect against loss of life and property.	6004
6004	Repair, rehabilitate, or replace 50% of aged stormwater infrastructure that is at high risk of failure and where failure would increase flood	Long Term (30 year)	2053	Entire RFPG	Flood risk will remain unchaged for 50% of	Take inventory of existing structures and report number of improved structures.	Protect against loss of life and property.	6003

1 of 1



Attachment 4

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

MEMORANDUM



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TO: Region 2 Lower Red-Sulphur-Cypress Regional Flood Planning Group

CC: Josh McClure, PhD, PE, CFM – Halff Associates, Inc.

FROM: David Rivera, PhD, PE, CFM – Freese and Nichols, Inc.

SUBJECT: Process for Identification and Evaluation of Potential FMEs and Potentially

Feasible FMPs and FMSs (Tasks 4A and 4B)

DATE: 9/22/2021

PROJECT: Lower Red-Sulphur-Cypress Regional Flood Plan (FNI Proj. No. HAF21355)

Introduction

Halff Associates, Inc. (Halff) along with Freese and Nichols, Inc. (FNI) has been retained as the Technical Consultant (TC) to the Lower Red-Sulphur-Cypress Regional Flood Planning Group (RFPG) to develop the first ever Regional Flood Plan (RFP) for the basin, as part of the state flood planning process administered by the Texas Water Development Board (TWDB). A major component of the process is to identify, evaluate, and recommend Flood Management Evaluations (FMEs), Flood Mitigation Projects (FMPs), and Flood Management Strategies (FMSs) to be included in the RFP and the cumulative State Flood Plan (SFP).

The Scope of Work (SOW) developed by TWDB includes a requirement to "receive public comment on a proposed process to be used by the RFPG to identify and select FMEs, FMSs, and FMPs for the 2023 Regional Flood Plan." This Technical Memorandum (TM) has been furnished to provide background information about the overall flood planning process and the associated technical requirements and to document the TC's proposed process for this task. It is intended to comply with the SOW and the relevant provisions of Title 31 of the Texas Administrative Code (TAC) Chapters 361 and 362 (Rules) which serve as the statute and rules that govern regional flood planning, and to be consistent with the Exhibit C Technical Guidelines for Regional Flood Planning (Technical Guidelines) prepared by the TWDB. This memo summarizes the methodology that we recommended the RFPG adopt for use in the following phases of the flood plan.

Definitions

According to the *Technical Guidelines*, definitions of key terms include:

A **Flood Management Evaluation (FME)** is a proposed flood study of a specific, flood-prone area that is needed in order to assess flood risk and/or determine whether there are potentially feasible FMSs or FMPs.

A **Flood Mitigation Project (FMP)** is a proposed project, either structural or non-structural, that has non-zero capital costs or other non-recurring cost and when implemented will reduce flood risk and mitigate flood hazards to life or property.

A **Flood Management Strategy (FMS)** is a proposed plan to reduce flood risk or mitigate flood hazards to life or property. At a minimum, RFPGs should include as FMSs any proposed action that they would like to identify, evaluate, and recommend that does not qualify as either an FME or FMP.



Process for Identification and Evaluation of Potential FMEs and Potentially Feasible FMPs and FMSs September 22, 2021 Page 2 of 7

Background

Identification and evaluation of FMEs, FMPs, and FMSs occur under *Task 4B* of the *SOW*, with recommendations being developed as part of *SOW Task 5*. Each of these recommendations must tie back to the floodplain management goals adopted by the RFPG and must contribute to the assessment and mitigation of flood risk across the basin.

FMEs, FMSs, and FMPs are broadly categorized as "flood risk reduction projects" (henceforth, "actions") in the *Technical Guidelines*. The *Technical Guidelines* also list several potential action types for each subcategory, summarized in *Table 1* below:

Table 1: Flood Risk Reduction Action Types

Flood Risk Reduction Action Category	Action Types
Flood Management Evaluation (FME)	 a. Watershed Planning i. H&H Modeling ii. Flood Mapping Updates iii. Regional Watershed Studies b. Engineering Project Planning i. Feasibility Assessments c. Preliminary Engineering (alternative analysis and up to 30% design) d. Studies on Flood Preparedness
Flood Mitigation Project	Structural
(FMP)	 a. Low Water Crossings or Bridge Improvements b. Infrastructure (channels, ditches, ponds, stormwater pipes, etc.) c. Regional Detention d. Regional Channel Improvements e. Storm Drain Improvements f. Reservoirs g. Dam Improvements, Maintenance, and Repair h. Flood Walls/Levees i. Coastal Protections j. Nature Based Projects – living levees, increasing storage, increasing channel roughness, increasing losses, de-synchronizing peak flows, dune management, river restoration, riparian restoration, run-off pathway management, wetland restoration, low impact development, green infrastructure k. Comprehensive Regional Project – includes a combination of projects intended to work together
	Non-Structural
	 a. Property or Easement Acquisition b. Elevation of Individual Structures c. Flood Readiness and Resilience d. Flood Early Warning Systems, including stream gauges and monitoring stations e. Floodproofing f. Regulatory Requirements for Reduction of Flood Risk
Flood Management Strategy (FMS)	None specified; at a minimum, RFPGs should include as FMSs any proposed action that the group would like to identify, evaluate, and recommend that does not qualify as either a FME or FMP.



Process for Identification and Evaluation of Potential FMEs and Potentially Feasible FMPs and FMSs September 22, 2021 Page 3 of 7

Particularly during this first round of flood planning, several areas are likely to be identified for potential FMEs due to a lack of sufficiently complete or current flood study data to accurately evaluate and quantify flood risk. Not every conceivable FME can or will be recommended for inclusion in the plan. The RFPG and the TC must decide which potential FMEs will be recommended in the RFP so that limited state and stakeholder resources can be directed efficiently and accordingly to implement those studies.

Similarly, regional stakeholders will likely propose several projects and strategies for managing flood risk that could be candidates for inclusion in the plan and eligible for state funding. Each FMP and FMS identified by the TC will be screened to determine if the FMP or FMS is potentially feasible. At a minimum, FMPs and FMSs must be developed in an adequate level of detail to furnish the required technical information and adhere to the minimum criteria set forth in the *SOW*, the *Rules*, and the *Technical Guidelines*.

For FMPs, these minimum criteria include having appropriate hydrologic and hydraulic (H&H) models required to evaluate that the project adheres to TWDB Mapping and Modeling Guidelines and a requirement that the FMP causes No Negative Impact on a neighboring area. These requirements must also be met for FMSs, as applicable. These standards are described in more detail in *Section 3.5* and *Section 3.6* of the *Technical Guidelines*.

Process for Identification of Potential FMEs and Potentially Feasible FMPs and FMSs

Identification

Identification of potential FMEs and potentially feasible FMPs and FMSs begins with the development of the Flood Mitigation Needs Analysis (*Task 4A*). Generally, this task is meant to guide action, evaluation and recommendation by highlighting:

- The areas with the greatest gaps in flood risk knowledge that should be considered for potential FMEs.
- The areas of greatest known flood risk and flood mitigation needs that should be considered for implementation of potentially feasible FMSs and FMPs.

FNI has developed a process for identifying areas of greatest need based on application of the requirements outlined in the *Rules* and *SOW*. The process is summarized in *Table 2*, below.

Table 2: Guidance for Assessment and Identification of Flood Mitigation Needs

Guidance	Factors to Consider
Most prone to flooding that threatens life and property	 Area overlapped by inundation mapping and/or included in any historical flooding record Building footprints / polygons within flood hazard layer Critical facilities with evacuation routes impacted by flooding Fully developed flood models (where available) Low water crossings Agricultural areas at risk of flooding



Process for Identification and Evaluation of Potential FMEs and Potentially Feasible FMPs and FMSs September 22, 2021 Page 4 of 7

Guid	ance	Factors to Consider
2.	Locations, extent and performance of current floodplain management and land use policies and infrastructure	 Communities not participating in NFIP and/or without NFIP equivalent or higher standards Disadvantaged / Underserved communities City / County design manuals Community Rating System (CRS) score Land use policies Floodplain ordinance(s)
3.	Inadequate inundation mapping	 No mapping Presence of Fathom / BLE / FEMA Zone A flood risk data Detailed FEMA models older than 10 years
4.	Lack of H&H models	Communities with zero modelsCommunities with limited models
5.	Emergency need	Damaged or failing infrastructureOther emergency conditions
6.	Existing models, analysis and flood risk mitigation plans	 Exclude flood mitigation plans already in implementation Leverage existing models, analyses, and flood risk mitigation plans Benefit-Cost Ratio > 1
7.	Already identified and evaluated flood mitigation projects	 Exclude flood mitigation projects already in implementation Leverage existing flood mitigation projects Benefit-Cost Ratio > 1
8.	Historic flooding events	 Disaster declarations Flood insurance claim information Other significant local events
9.	Already implemented flood mitigation projects	 Exclude areas where flood mitigation projects have already been implemented unless significant residual risk remains
10.	Additional other factors deemed relevant by RFPG	Alignment with RFPG goalsAlignment with TWDB guidance principles

After identification of the areas of greatest flood mitigation need, the TC will review the available data to develop a list of potential flood risk reduction actions for addressing the needs in these areas. The data will include information compiled under previous tasks in the *SOW*, including:

- Data collection regarding existing flood infrastructure, flood projects currently in progress, and known flood mitigation needs (*Task* 1);
- Quantification of existing and future flood risk exposure and vulnerability (Tasks 2A and 2B);
- Goals and strategies adopted and/or recommended by the RFPG for addressing existing flood hazards and mitigating future flood risk (*Tasks 3A* and *3B*); and,
- Stakeholder-provided input throughout the flood planning process.

The TC anticipates several potential actions will be identified, primarily FMEs, to address gaps in available flood risk data associated with the first planning cycle. The *Rules* and *SOW* require FMSs and FMPs to be developed in a sufficient level of detail to be included in the RFP and recommended for state funding. The



Process for Identification and Evaluation of Potential FMEs and Potentially Feasible FMPs and FMSs September 22, 2021 Page 5 of 7

TC does not anticipate that this first planning cycle will have sufficient data, time, or budget to develop new FMSs and FMPs. For the most part, the list of potentially feasible FMSs and FMPs likely will be compiled based on contributions from the RFPG and other regional stakeholders from sources such as previous flood studies, drainage master plans, and capital improvement programs. However, the TWDB is currently in the process of allocating additional flood planning funding and developing an addendum to the RFP scope of work that may allow TC to develop FMEs into FMPs. This additional source of funding could potentially provide opportunities to increase the number of actions that would qualify as FMPs in the plan's first cycle.

Evaluation

Once potential flood risk reduction actions are identified, the TC will perform a screening process to sort actions into their appropriate categorization. The screening process is shown below in *Figure 1*.

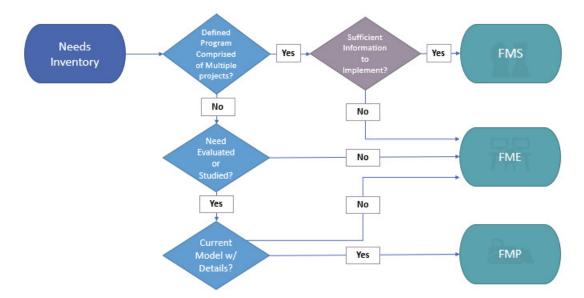


Figure 1: Potential Flood Risk Reduction Action Screening Process

In addition to falling into the general buckets of action types outlined in *Table 1*, FMPs and FMSs will be screened to determine if they have been developed in enough detail and include current technical data to meet the TWDB's requirements for these action types as outlined in the *Technical Guidelines*. For instance, one requirement is to prove the project has No Negative Impacts on neighboring areas. Table 21 in Section 3.6 of the *Technical Guidelines* specifies the impacts analysis should include discharge, velocity, valley storage, and downstream conveyance considerations. This detailed analysis is only achievable if hydrologic and hydraulic models are available. Furthermore, a Benefit-Cost Analysis (BCA) is also required to demonstrate that a recommended FMP has a Benefit-Cost Ratio (BCR) greater than one (see Section 3.8 of the *Technical Guidelines*). As part of the FMP evaluation, it is likely that the BCA will need to be revised to reflect updated cost estimates. Therefore, sufficient data must be available to perform the necessary BCA calculations. Actions that were initially considered for FMSs and FMPs that do not meet these requirements may be recommended for future study as part of an FME.

Selection

The TC will seek to identify and recommend a comprehensive list of potential flood risk reduction actions for inclusion in the RFP. In practice, this means that as many FMPs and FMSs as possible will be



Process for Identification and Evaluation of Potential FMEs and Potentially Feasible FMPs and FMSs September 22, 2021 Page 6 of 7

recommended which have information available to meet the detailed requirements specified in the *Technical Guidelines*. FMSs will also be recommended for other strategies the RFPG wishes to pursue that do not fit cleanly into the FME or FMP categorizations. One example of a potential FMS is a program of separate FMPs that is part of an overall strategy to reduce flood risk within a particular area, such as a community-wide buyout program to be implemented over several years. Generally, FMEs will be recommended for any remaining areas with potential flood risk and exposure of people and property based on results of *Task 4A*.

All recommended actions must meet the technical requirements of the *Technical Guidelines*, including demonstrating No Negative Impacts and identifying at least one local sponsor. However, some potential actions that meet these baseline requirements may not be appropriate for recommendation. While this is not a comprehensive list, some potential reasons a project may not be recommended include:

- Action does not achieve flood risk reduction
- Action does not align with the flood mitigation goal(s) adopted by the region and/or the guidance principles set forth by the state
- Action does not demonstrate benefits at a scale appropriate for inclusion in a regional plan
- Action duplicates the benefits of another action(s) included in the plan
- Action cannot obtain a Memorandum of Understanding (MOU) or other form of concurrence from impacted entities
- Action does not demonstrate a sensible benefit-cost ratio or other metric
- Public input regarding the action demonstrates a need for further evaluation or consensus building with regional stakeholders
- Action does not receive a simple majority vote from a quorum of the RFPG members for inclusion in the RFP.

Schedule

The process to identify and evaluate FMEs, FMPs, and FMSs must be approved by the RFPG and included in the Technical Memorandum (TM) furnished under *Task 4C.1.h* of the *SOW*. This deliverable deadline has been set for January 7, 2022 by the TWDB. However, the TWDB has extended the deadline to submit certain portions of the TM deliverables to March 7, 2022 (SOW items 4C.1.c-e). Furthermore, the list of potential FMEs, FMPs, and FMSs that shall be provided by the January 7, 2022 deadline are considered an initial submittal and can be enriched, changed, and enhanced during the latter part of plan development.

After the delivery of the TM, the TWDB will review and provide Notice to Proceed (NTP) on *Task 5*, after which the TC may begin the process of recommending FMEs and FMPs for inclusion in the RFP. The TWDB has not provided an anticipated date for issuance of NTP. As such, the schedule provided in *Table 3* below is the TC's proposed timeline of activities to meet the TM deadline and anticipated schedule of activities after NTP on *Task 5*.



Process for Identification and Evaluation of Potential FMEs and Potentially Feasible FMPs and FMSs September 22, 2021 Page 7 of 7

Table 3: Proposed Timeline of Activities

Flood Planning Process Activity	Anticipated Date
TC delivers Process for Identification and Evaluation of Potential FMEs and Potentially Feasible FMPs and FMSs TM to RFPG for review	September 22, 2021
RFPG considers approval of Process at October meeting	October 7, 2021
TC presents identified potential FMEs and potentially feasible FMPs and FMSs to RFPG	November 2021
TC refines list of identified potential FMEs and potentially feasible FMPs and FMSs and deliver TM to RFPG for review	November 2021 – December 2021
RFPG considers approval to submit TM	December 2021
TC delivers TM to TWDB (SOW items 4C.1.a-b, 4C.1.f-j)	January 7, 2022
TWDB review TM; TC continue process to evaluate FMEs, FMPs, and FMSs	January 2022 – TBD
TC delivers TM update to TWDB (SOW items 4C.1.c-e)	March 7, 2022
TWDB issues NTP on Task 5; TC to begin process of recommending FMEs, FMPs, and FMS for inclusion in RFP	TBD (after NTP by TWDB)

When reviewing and considering whether to approve drafts of the TM, the RFPG members should do so with the understanding that the TWDB has established the TM as a "draft, mid-point, work-in-progress deliverable...to demonstrate that [the RFPG] are making appropriate progress towards the development of their regional flood plan and in meeting contract requirements." On August 17, 2021, the TWDB emailed the TC and further clarified that:

"If RFPGs need to make changes to content that was included in deliverables submitted under the technical memorandum after the submission deadline, RFPGs do not need to resubmit any previously submitted deliverables. The content of the draft and final versions of each regional flood plan will supersede all content included in any previous deliverables."

As such, the TM does not need to include the final list of potential flood risk reduction actions. Actions can be updated, added, or removed as additional flood risk information or other details are evaluated by the TC and through future engagement with stakeholders. Furthermore, the TWDB is currently planning to authorize additional funds that may contribute to developing additional flood risk reduction actions that may be incorporated in the RFP during the first planning cycle. This authorization is forthcoming and the process for incorporating the outputs of that supplementary effort will be developed at a future date.



Attachment 5

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

FME ID	RFPG No.	RFPG Name	FME Name	Description	Associated Goals	Counties	HUC8s	HUC12s
FME0001	2	Lower Red-Sulphur-Cypress	Cooke County FIS	Update County maps to Zone AE	3001. 3002	Cooke	11130210	120301040105, 120301030402, 11302100202, 120301030102, 120301030102, 120301030304, 11302010703, 11302100703, 120301030105, 12030103005, 120301030303, 120301030205, 11302100704, 120301030302, 120301030302, 120301030302, 120301030503, 11302100201, 120301030302, 12030103
FME0002	2	Lower Red-Sulphur-Cypress	Grayson County FIS	Update remainder of county to Zone AE	3001. 3003	Grayson	11130210, 11140101	120301060302, 111302100505, 120301030206, 111302100505, 120301030206, 111302100405, 120301030204, 120301030204, 111401010107, 111401010103, 111401010105, 120301030701, 111302100503, 120301060301, 111401010203, 111302100304, 120301030704, 1120301030704, 111401010103, 111302100403, 120301030201, 111401010101, 111403010101, 111403010101, 111403010101, 111403010101, 111403010101, 111403010101, 111403010102, 111403010102, 111403010102, 111403010103, 11140301003, 11140301003, 1114030103, 11140301003, 111403
FME0003	2	Lower Red-Sulphur-Cypress	Fannin County FIS	Update County maps to Zone AE	3001. 3004 F	annin	11140101, 11140301, 11140102	111401010508, 111401010505, 111401010506, 111401010603, 111403010203, 111403010203, 111401010404, 111401010507, 111401010507, 111401010501, 111403010302, 111403010303, 111401010203, 111401010804, 111401010401, 111403010304, 111401010503
FME0004	2	Lower Red-Sulphur-Cypress	Hunt County FIS	Update County maps to Zone AE	3001. 3005	Hunt	11140301	120100010401, 111403010202, 111403010101, 120100010402, 111403010201, 120100010405, 111403010201, 120100010405, 1120100010405, 1120100010405, 1120100010405, 111403010102, 111403010103, 120100010201, 111403010105, 120100010201, 111403010201, 120100010405, 120100010405, 111403010102, 111403010105, 120100010201, 111403010201, 120100010301, 120100010301, 120100010405, 111403010102, 111403010105, 120100010201, 111403010105, 120100010301, 120100010301, 120100010405, 111403010102, 111403010105, 120100010201, 111403010105, 120100010301, 120100010301, 120100010405, 111403010105, 120100010405, 120100010405, 111403010105, 120100010405, 111403010105, 120100010405,
FME0005	2	Lower Red-Sulphur-Cypress	Lamar County FIS	Update County maps to Zone AE	3001. 3006 L	.amar	11140101, 11140301, 11140106, 11140302	1114031010701,111401010705,111403010406,111401010808,111403010305,111403010305,111403010308,1114
FME0006	2	Lower Red-Sulphur-Cypress	Delta County FIS	Develop FIS for the County	3001. 3007	Delta	11140301, 11140302	111403010403, 111403010406, 111403010305, 111403010208, 111403010208, 111403010206, 111403010206, 111403010402, 111403010402, 111403010402, 111403010406, 111403010308, 111403010404, 111403010203, 111403010205, 111403010205, 111403010205, 111403010401
FME0007	2	Lower Red-Sulphur-Cypress	Hopkins County FIS	Update County maps to Zone AE	3001. 3008	Hopkins	11140301, 11140303, 11140305, 11140302	111403010403, 111403030101, 111403030101, 111403030108, 111403030108, 111403030107, 111403030105, 120100030105, 120100030105, 111403030103, 11
FME0008	2	Lower Red-Sulphur-Cypress	Red River County FIS	Develop FIS for the County	3001. 3009 F	Red	11140101, 11140106, 11140302	111401010705, 111401010808, 111403020208, 111403020102, 111403020105, 111401060007, 111401060202, 111403020201, 111403020203, 111403020207, 111403020207, 111403020207, 111403020207, 111403020107, 111403020207, 11
FME0009	2	Lower Red-Sulphur-Cypress	Fraklin County FIS	Develop FIS for the County	3001. 3010 F	ranklin	11140301, 11140303, 11140305, 11140302	120100020202, 111403030201, 111403030201, 111403030204, 111403030204, 111403030101, 111403050201, 111403050201, 111403050201, 111403050201, 111403050201, 111403050202, 111
FME0010	2	Lower Red-Sulphur-Cypress	Titus County FIS	Update County maps to Zone AE	3001. 3011	litus	11140303, 11140305, 11140302	111403020105, 111403050305, 111403050204, 111403050204, 111403050302, 111403050302, 111403050302, 111403050303, 111403050303, 111403050304, 111403050204, 111403050202, 111403050202, 111403050203, 111403050304, 11
FME0011	2	Lower Red-Sulphur-Cypress	Camp County FIS	Develop FIS for the County	3001. 3012	Camp	11140307, 11140305	111403050308, 111403050401, 111403050302, 111403070106, 111403050201, 111403050201, 111403050202, 111403050202, 111403070107, 111403050304, 111403050310, 111403050301, 111403050307, 111403050307, 111403070105
FME0012	2	Lower Red-Sulphur-Cypress	Wood County FIS	Update County maps to Zone AE	3001. 3013 N	Wood	11140307, 11140305	120100020202, 120100020101, 120100020105, 120100020105, 120100020206, 120100030302, 120100020205, 111403070102, 120100030303, 120100030203, 120100030203, 120100030203, 120100030203, 120100030203, 120100030303, 120100030303, 120100030303, 120100030203, 120100030203, 120100030203, 120100030203, 120100030203, 120100030203, 120100030203, 120100030203, 120100030203, 120100030203, 120100030303, 120100030303, 120100030303, 120100030303, 120100030203, 120100030203, 120100030203, 120100030203, 120100030203, 120100030303, 12
FME0013	2	Lower Red-Sulphur-Cypress	Upshur County FIS	Update County maps to Zone AE	3001. 3014 L	Jpshur	11140307, 11140305	111403050308, 120100020206, 111403050401, 120100020403, 120100020403, 120100020403, 120100020505, 111403070102, 111403070103, 120100020504, 120100020504, 120100020401, 111403070106, 111403070109, 111403070104, 111403070101, 111403070101, 111403070105, 11
FME0014	2	Lower Red-Sulphur-Cypress	Gregg County FIS	Update County maps to Zone AE	3001. 3015	Gregg	11140307	120100020608, 120100020603, 120100020606, 120100020603, 120100020603, 120100020501, 120100020504, 111403070204, 120100020601, 120100020602, 120100020502, 120100020505, 120100020505, 120100020506, 120100020505, 120100020405, 120100020503
FME0015	2	Lower Red-Sulphur-Cypress	Harrison County FIS	Update County maps to Zone AE	3001. 3016	Harrison	11140306, 11140307, 11140305, 11140304	120100020906, 120100020903, 111403070206, 120100020906, 1201000200006, 1201000000006, 12010000000000000000000000000000000000
FME0016	2	Lower Red-Sulphur-Cypress	Marion County FIS	Develop FIS for the County	3001. 3017 M	Marion	11140306, 11140307, 11140305	11403060208, 111403050401, 111403050409, 111403060409, 111403060409, 111403060401, 111403060407, 111403060407, 111403060405, 1114
FME0017	2	Lower Red-Sulphur-Cypress	Cass County FIS	Update County maps to Zone AE	3001. 3018	Cass	11140306, 11140303, 11140305, 11140304, 11140302	11140302608, 111403060304, 111403060208, 111403060202, 111403060202, 111403060201, 111
FME0018	2	Lower Red-Sulphur-Cypress	Bowie County FIS	Update County maps to Zone AE	3001. 3019 E	3owie	11140201, 11140106, 11140302	1114032020608, 1114032020707, 1114032020707, 1114032020502, 1114032020601, 111401066006, 111401066006, 111401066002, 111403020707, 111401066003, 111403020707, 111401066060, 111403020707, 111401066007, 1114030207, 1114030207, 1114030207, 1114030207, 1114030207, 1114030207, 1114030207, 1114030207,
FME0019	2	Lower Red-Sulphur-Cypress	Morris County FIS	Update County maps to Zone AE	3001. 3020 M	Morris	11140306, 11140303, 11140305, 11140302	111403060202, 111403050401, 111403050305, 111403050305, 111403020303, 111403060203, 111403060204, 111403050306, 111403050006, 11140305006, 11140305006, 11140305006, 11140305006, 1114030
FME0020	2	Lower Red-Sulphur-Cypress	Sulphur River Log jams	Log and debris jams along Sulpur River near Highway 37 and 24				
FME0021	2	Lower Red-Sulphur-Cypress	City of Clarksville Deleware Creek	Debris, Vegetation Removal, and Channelization		Red River		
FME0022	2	Lower Red-Sulphur-Cypress	New Boston Unnamed Stream 1	Debris, Vegetation Removal, and Channelization	F	Bowie		
FME0023	2	Lower Red-Sulphur-Cypress	New Boston Unnamed	Debris, Vegetation Removal, and Channelization		Bowie		
FME0024	2	Lower Red-Sulphur-Cypress		Debris, Vegetation Removal, and Channelization				
	2	Lower Red-Sulphur-Cypress				Bowie		
FME0025		Lower Red-Sulphur-Cypress		Debris, Vegetation Removal, and Channelization	E	oowie		
FME0026	2	Lower Red-Sulphur-Cypress	Dekalb Stormwater	WWTP impacted by flooding from Anderson Creek	E	Bowie		
FME0027	2	Lower Red-Sulphur-Cypress	Drainage Dekalb stormwater rate	City wide storm drain study	E	sowie		
FME0028	2	Lower Red-Sulphur-Cypress	study Dekalb flood Control levee	City wide storm water rate study Flood control levee system to reduce flood risk for Dekalb	E	Bowie		
FME0029	2	Lower Red-Sulphur-Cypress	system	and surronding entities along Red River Widen ditches to increase volume capacity of flash flood	E	Bowie		
FME0030	2	Lower Red-Sulphur-Cypress	City of Hooks Infrastructure		E	Bowie		
FME0031	2	Lower Red-Sulphur-Cypress	Upshur County drainage	and streets.		Jpshur		
FME0032	2		Cowhorn Creek East	Extend current study to upstream detenion pond	E	Bowie		
FME0033	2	Lower Red-Sulphur-Cypress	Wadley Hospital	Storm drain near hospital likely undersized	E	3owie		
FME0034	2	Lower Red-Sulphur-Cypress	Urban Flooding at 19th and Wood Street	Houses flood 4-5 times per year	E	Bowie		
FME0035	2	Lower Red-Sulphur-Cypress	Cowhorn West Creek	Arroyo Street additional modeling to address flooding	E	3owie		
FME0036	2	Lower Red-Sulphur-Cypress	Cowhorn Creek	Creek crosses interstate near St. Michaels and existing flooding risk upstream of interstate	E	Bowie		
FME0037	2	Lower Red-Sulphur-Cypress	Stream WC-1	Street flooding near McKnight and Jonathan Street Prepare a strategy and support program for vlountary	E	3owie		
FME0038	2	Lower Red-Sulphur-Cypress	Buyout	purchase of at risk properties where there is a significant threat and other risk reductions alternatives are infeasible	E	Bowie		

1 of 2

FME ID Watershed Name	Study Type	FME Area (sqmi)	Flood Risk Type	Sponsor	Entities with Oversight	Emergency Need	Estimated Study Cost	Potential Funding Estimated number of Sources and Amount structures at flood risk	Estimated Population at flood risk		stimated number of road closures (#)	stimated length of roads at flood risk	Estimated active farm & ranch land at flood risk Models (year)	Existing or Anticipated Maps (year)	RFPG Recommendation (Y/N)	Reason for Recommendation
		1.4	.,,,,,							 , , , , , , , , , , , , , , , , , , ,		(Miles)	(acres)			
FME0001 Elm Fork Trinity, Denton, Lake Texoma, Farmers-Mud	FIS	111.178874	4 Riverine	Cooke County	FEMA, TWDB											
FME0002 East Fork Trinity, Bois D'arc-Island, Elm Fork Trinity, Lake Texoma	FIS	633.93642	3 Riverine	Grayson County	FEMA, TWDB											
FME0003 East Fork Trinity, Bois D'arc-Island, Sulphur Headwaters, Blue	FIS	853.19628	8 Riverine	Fannin County	FEMA, TWDB											
FME0004 East Fork Trinity, Sulphur Headwaters, Cedar, Lake Fork, Upper Sabine	FIS	235.006778	8 Riverine	Hunt County	FEMA, TWDB											
FME0005 Bois D'arc-Island, Sulphur Headwaters, Pecan-Waterhole, Lower Sulpher	FIS	931.795882	2 Riverine	Lamar County	FEMA, TWDB											
FME0006 Sulphur Headwaters, Lower Sulpher	FIS	277.126705	5 Riverine	Delta County	FEMA, TWDB											
FME0007 Bois D'arc-Island,Pecan-Waterhole,Lower Sulpher	FIS	543.35846	1 Riverine	Hopkins County	FEMA, TWDB											
FME0008 Middle Sabine, Sulphur Headwaters, White Oak Bayou, Lake Fork, Lake O'the Pines, Lower Sulpher	FIS	1054.99598	8 Riverine	Red County	FEMA, TWDB											
FME0009 Middle Sabine, Sulphur Headwaters, White Oak Bayou, Lake O'the Pines, Lower Sulpher	FIS	293.467964	4 Riverine	Fraklin County	FEMA, TWDB											
FME0010 White Oak Bayou, Lake O'the Pines, Lower Sulpher	FIS	425.480333	7 Riverine	Titus County	FEMA, TWDB											
FME0011 Little Cypress,Lake O'the Pines	FIS	202.655994	4 Riverine	Camp County	FEMA, TWDB											
FME0012 Middle Sabine, Little Cypress, Lake Fork, Upper Sabine, Lake O'the Pines	FIS	56.766875	5 Riverine	Wood County	FEMA, TWDB											
FME0013 Middle Sabine, Little Cypress, Lake O'the Pines	FIS	427.787624	4 Riverine	Upshur County	FEMA, TWDB											
FME0014 Middle Sabine, Little Cypress	FIS	28.436605	5 Riverine	Gregg County	FEMA, TWDB											
FME0015 Middle Sabine, Caddo Lake, Little Cypress, Lake O'the Pines, Cross Bayou	FIS	532.160643	3 Riverine	Harrison County	FEMA, TWDB											
FME0016 Caddo Lake,Little Cypress,Lake O'the Pines	FIS	418.818144	4 Riverine	Marion County	FEMA, TWDB											
FME0017 Caddo Lake, White Oak Bayou, Lake O'the Pines, Cross Bayou, Lower Sulpher	FIS	956.773984	4 Riverine	Cass County	FEMA, TWDB											
FME0018 McKinney-Posten Bayous, Pecan-Waterhole, Lower Sulpher	FIS	920.100627	7 Riverine	Bowie County	FEMA, TWDB											
FME0019 Caddo Lake, White Oak Bayou, Lake O'the Pines, Lower Sulpher	FIS	256.934513	3 Riverine	Morris County	FEMA, TWDB											
FME0020																
FME0021																
FME0022																
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A	FMP ID RE	IFPG No.		FMP Name	Description	Associated Goals (ID) Co	Counties		Watershed Name	Project Type	Project Area (sqmi)	(Riverine, Coastal,	Sponsor	Entities with Oversight	Emergency Need (Y/N)		Potential Funding Sources and Amount
Note 10 min 10										Infrastructure (channels							
March State Stat	2 FMP0001	ŀ	Lower Red-Sulphur-Cypress	City of Atlanta High School Lane. Project/Phase No. 2		6001. 6002. 6003. 6004 Cass	1: ss 1:			ditches, ponds, pipes, etc.)	44.15474	Riverine/Urban	City of Atlanta		n s	950,000.00	City Stormwater Fee, TWDB
April Company Compan	2	ı	Lower Red-Sulphur-Cypress				1:	11403060304, 111403020702, 111403040201, 111403040203, 111403040205,									
	FMP0002		Lower Red-Sulphur-Cypress	City of Atlanta Eleanor St and Red Bluff St. Project/Phase No. 3		6001. 6002. 6003. 6004 Cass		·			44.154/4	Urban	City of Atlanta		\$	50,000.00	
	FMP0003			City of Atlanta Park View St and Jefferson St. Project/Phase No. 4	2033	6001. 6002. 6003. 6004 Cass				etc.)	44.15474	Urban	City of Atlanta		ş	50,000.00	
	2 FMP0004	I	Lower Red-Sulphur-Cypress	City of Paris Big Sandy Cr Tribs 4 and 6 Improvements - Phase 1	ss- lined channel with 4:1 side slopes at the existing depth. The channel upstream of Clarksville Avenue up to and including the confluence with Tributary 6 will be replaced with a 15-	6003, 6004 Lama			Headwaters,Lower		56.07414	Riverine/Urban	City of Paris		n ş	4,635,825.33	
March Marc	2 FMP0005	ı	Lower Red-Sulphur-Cypress	City of Paris Big Sandy Cr Tribs 4 and 6 Improvements - Phase 2	luence upstream to Lamar Avenue with a 15-foot wide concrete channel with vertical walls, with a cut r				Headwaters,Lower		56.07414	Riverine/Urban	City of Paris		N S	3,778,199.22	
	2 FMP0006	ı	Lower Red-Sulphur-Cypress	City of Paris Rig Sandy Cr Tribs 4 and 6 Improvements - Phase 3	wide, vertical wall concrete channel. The culverts along Tributary 6 will need to be replaced with bridge				Headwaters,Lower		56.07414	Riverine/Urban	City of Paris		N S	1.823,405 60	
100 100	2	I	Lower Red-Sulphur-Cypress		A more and a more and a many to design them	Lama	1:	11401010701, 111403010406, 111401010601, 111403010306, 111401010703, 111403010407, 111401010605, 111403010308, 111403010307, 111401010702,	Bois D'arc-Island,Sulphur Headwaters,Lower								
March Marc	2 FMP0008	ı	Lower Red-Sulphur-Cypress	City of Paris Compr. Plan Project 2		Lama	1:	11403010407, 111401010605, 111403010308, 111403010307, 111401010702,	Headwaters,Lower	<null></null>	199.3267	Urban	City of Paris		ş	1,042,537.00	
State Stat	2 FMP0009	ı	Lower Red-Sulphur-Cypress	City of Paris Compr. Plan Project 3		Lama	1:	11403010407, 111401010605, 111403010308, 111403010307, 111401010702,	Headwaters,Lower	<null></null>	199.3267	Urban	City of Paris			337,325.00	
Section Sect	2 FMP0010	ı	Lower Red-Sulphur-Cypress			Lama	1:	11401010701, 111403010406, 111401010601, 111403010306, 111401010703, 11403010407, 111401010605, 111403010308, 111403010307, 111401010702,	Headwaters,Lower	<null></null>	199.3267	Urban	City of Paris			439,457.00	
1146/00000 1146/000000 1	2	1	Lower Red-Sulphur-Cypress			Lama	1:	11401010701, 111403010406, 111401010601, 111403010306, 111401010703, 11403010407, 111401010605, 111403010308, 111403010307, 111401010702,	Headwaters,Lower	<null></null>					ş	526,137.00	
New York Column Final Project Final Pr	2 FMP0012	ı	Lower Red-Sulphur-Cypress	City of Paris Compr. Plan Project 6		Lama	1:	11403010407, 111401010605, 111403010308, 111403010307, 111401010702,	Headwaters,Lower	<null></null>	199.3267	Urban	City of Paris		Ş	1,036,026.00	
	2 FMP0013	ı	Lower Red-Sulphur-Cypress	City of Paris Compr. Plan Project 7		Lama	1:	11403010407, 111401010605, 111403010308, 111403010307, 111401010702,	Headwaters,Lower	<null></null>	199.3267	Urban	City of Paris		\$	581,191.00	
1 1 1 1 1 1 1 1 1 1	2 FMP0014	ı	Lower Red-Sulphur-Cypress	City of Paris Compr. Plan Project 8		Lama	1:	11403010407, 111401010605, 111403010308, 111403010307, 111401010702,	Headwaters,Lower	<null></null>	199.3267	Urban	City of Paris		ş	327,179.00	
2 Lower Red-Sulphur-Cypress Lower Red-Sulphur-Cypres	2 FMP0015	ı	Lower Red-Sulphur-Cypress	City of Paris Compr. Plan Project 9		Lama	1:	11403010407, 111401010605, 111403010308, 111403010307, 111401010702,	Headwaters,Lower	<null></null>	199.3267	Urban	City of Paris		Ş	489,733.00	
2 Lower Red-Sulphur-Cypress Lower Red-Sulphur-Cypres	2 FMP0016	ı	Lower Red-Sulphur-Cypress	Ferruson Park Feasibility Shirky	Improvements to existing rulyers and channelization	5001 5002			Bayous,Pecan- Waterhole,Lower		<null></null>	Urhan	City of Tavarkana			10 685 000 00	
McKinney-Posten Bayous,Pecan- Infrastructure (channels, 111402010201, 111403020705, 111401060605, 111403020704, Waterhole,Lower ditches, ponds, pipes, 111401060605, 11401060605, 1140	2	I	Lower Red-Sulphur-Cypress				1:	11402010201, 111403020705, 111401060606, 111401060605, 111403020704,	McKinney-Posten Bayous,Pecan- Waterhole,Lower						Š		
FMPD118	2 FMP0018	I	Lower Red-Sulphur-Cypress	wagner creek Stream WC-2	Independence Circle & Lexington Place Bridge Improvements	6001. 6002 Bow	1:		McKinney-Posten Bayous,Pecan-	Infrastructure (channels,	<null></null>	Urban	City of Texarkana			1,325,277.53	

LOWER RED-SULPHUR-CYPRESS REGIONAL FLOOD PLAN

					Flood F	Diek									Poduction i	a Elood Birk														
			Fetimated		riood H	ni3k			Fetimated	Estimated	Number of	Number of	Number of	Residential Estimat	ed Critical	Number of		Estimated	Estimated					Percent		Negative				
FMP ID	Area in 100yr (1% annual chance)	Area in 500yr (0.2% annual chance)	number of structures at	Residential Est structures at Pope 100-year flood 100-year	timated ulation at year flood 10	Critical facilities at 100-year flood	Number of low water d crossings at	Estimated number of road closures	length of roads at 100-	farm & ranch land at 100-	with reduced 100yr (1%	removed from 100yr (1%	removed from 500yr (0.2%	Residential Estimat structures Populat removed from removed 100yr (1% 100yr (1 annual annua chance) Flood chance) F	from removed fro 100yr (1%	m crossings removed from	Estimated reduction in road closure	roads removed	farm & ranch land removed from 100yr	Estimated reduction in fatalities (if	Estimated reduction in injuries (if	Pre-Project Post-Project Level-of- Level-of- Service Service	Cost/ Structure removed	Nature-based Solution (by	Negative Impact (Y/N)	Impact Mitigation (Y/N)	Social Vulnerability Index (SVI) Water Su Benefit (ply for Low Water (N) Crossings	Benefit-Cost Recommendation Ratio (Y/N)	Reason for Recommendation
	Floodplain	Floodplain	risk	risk	risk	risk (#)	flood risk (#)	(#)	(Miles)	(acres)	chance) Flood risk	chance) Flood risk	chance) Flood risk	chance) Flood chance) F	lood chance) Floo	chance) Floor	occurrences	flood risk (Miles)	flood risk (acres)	available)	available)			03.(7		(0)40				
FMP0001																														
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FMP0018																													1.15	

2 of 2 LOWER RED-SULPHUR-CYPRESS REGIONAL FLOOD PLAN

														Flood Risk					Reduction in Flood Risk							
FMS ID R	RFPG No.		FMS Name	Description	Associated Countie	es HUC8s HUC12s		Project Type Strategy Project - (Riverine, Area (sqmi) Coastal, Urban, Playa Other)	e Sponsor	Entities with Emergency Estimated Oversight Need (Y/N) Project Cost (Potential Funding 100yr (1%) Sources and chance) Amount Floodplair	Area in 500yr (0.2% n annual chance) Floodplain	Estimated Residential Estructures at 100yr at flood risk	stimated Critica opulation facilities at flood flood ri risk (#)	Number of Estimate low water number crossings road at flood closure risk (#) (#)	d Estimated active far roads at flood risk {Miles}	Number of structures with reduced 100yr (1% from 100yr annual chance) Flood risk Number of structures removed 100yr (1% annual 1% annual risk risk risk	Number of structures removed from 500yr (0.2% annual chance) Flood risk Residential structures removed from 100yr (b.2% annual chance) Flood risk Residential structures removed from 100yr (b.2% annual chance) Flood risk	chance) Flood rick chance)	Estimated Freduction in road closure occurrence es	Estimated length of roads removed from 100yr flood risk [Miles]	Estimated reduction in fatalities (if available)	Consideration of Nature-based removed Solution (Y/N)	Negative Impact Impact (Y/N) Mitigation (Y/N)	Water RFPG Supply Recomme Renefit ndation (Y/N) (Y/N)	eason for ecomme indation
2 R2FMS0001	Low	wer Red-Sulphur-Cypress	Marion County barriers	Install low water crossing barriers, similar to railroad crossing															14							
2	Low	wer Red-Sulphur-Cypress	Panola County outreach	Um (1623).	2301				Marion County																	
R2FM50002	Low	wer Red-Sulphur-Cypress	City of Beckville outreach	Educational outreach	1001 Panola				Panola County																	
R2FM50003				Educational outreach	1001 Panola				City of Beckville																	-
R2FMS0004	Low	wer Red-Sulphur-Cypress	City of Miller's Cove outreach	Educational outreach	1001 Titus				City of Miller																	_
2 R2FMS0005	Low	wer Red-Sulphur-Cypress	City of Winfield NFIP	Participate in NFIP	3001, 4001 Titus				City of Winfield																	
2 R2FMS0006	Low	wer Red-Sulphur-Cypress	Upshur County NFIP	The County Hazard Mitigation Officer will assist those cities within the county that are not participating in NFIP to take appropriate actions to qualify for, and maintain participation in NFIP with a goal of having 100% participation within the county	3001, 4001 Upshur				Upshur County																	
2	Low	wer Red-Sulphur-Cypress	Wood County outreach																							
R2FMS0007	Low	wer Red-Sulphur-Cypress	Wood County land preservation	Educate the public on mitigation strategies for all hazards. Acquisition and management strategies of land to preserve	1001 Wood				Wood County																	
R2FMS0008	lav	wer Red-Sulphur-Cypress	City of Texarkana gauges	open space for flood mitigation and water quality in the floodplain install depth gauges and radio-controlled guard arms at three flood-prone underpasses and warning lights and "Do Not Enter" sign at flood-prone residential intersection. City wishe	Wood				Wood County																	
R2FMS0009				enter sign at none-prone residential intersection. Lity wisne to upgrade these sites to include automatic barrier arms linked to gauges, if funding is available through grants. replacement with low-impact recreational area for use by general public. Priority: Original HMP—High; for 2011 update	Bowie				City of Texarkana																	
2 R2FMS0010	Low	wer Red-Sulphur-Cypress	City of Texarkana buy-outs	general pounts, includes, original more might, or 2011 update priority has changed to Low, as project is put in suspense pending additional mapping and risk information that will likely indicate that the area is no longer at any significant	5001 Bowie				City of Texarkana																	
2 R2FMS0011	Low	wer Red-Sulphur-Cypress	City of Avinger NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002 Cass		Caddo Lake,Lake O'the Pines	NFIP/CRS 2.024529	City of Avinger																	
2	Low	wer Red-Sulphur-Cypress	City of Bells NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001. 4002 Grayson	n	Bois D'arc-Island	NFIP/CRS 2.118419	City of Bells	s																
R2FMS0012	Low	wer Red-Sulphur-Cypress																								
R2FMS0013	Low	wer Red-Sulphur-Cypress	City of Cooper NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002 Delta		Sulphur Headwaters	NFIP/CRS 1.23943	City of Cooper																	
R2FMS0014			City of Domino NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001. 4002 Cass		Lower Sulpher	NFIP/CRS 0.174084	City of Domino																	
R2FM50015	Low	wer Red-Sulphur-Cypress	City of Dorchester NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002 Grayson		East Fork Trinity, Bols D'arc-Island, Elm Fork Trinity	NFIP/CRS 0.095152	City of Dorchester																	\dashv
2 R2FMS0016	Low	wer Red-Sulphur-Cypress	City of Douglassville NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001. 4002 Cass		Lower Sulpher	NFIP/CRS 3.990864	City of Douglassville	e																
2 R2FMS0017	Low	wer Red-Sulphur-Cypress	City of Leonard NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001. 4002 Fannin		East Fork Trinity,Sulphur Headwaters	NFIP/CRS 0.051491	City of Leonard																	
2	Low	wer Red-Sulphur-Cypress																								
R2FM50018	Low	wer Red-Sulphur-Cypress	City of Marietta NFIP Involvement	Application to Join NFIP or adoption of equivalent standards	4001. 4002 Cass		Caddo Lake East Fork Trinity,Bois D'arc-Island,Lake	NFIP/CRS 0.605605	City of Marietta																	
R2FMS0019	Low	wer Red-Sulphur-Cypress	City of Sherman NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002 Grayson		Texoma	NFIP/CRS 45.87181	City of Sherman																	
R2FMS0020			City of Tom Bean NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001. 4002 Grayson		East Fork Trinity,Bols D'arc-Island	NFIP/CRS 0.806706	City of Tom Bean																	
R2FMS0021	Low	wer Red-Sulphur-Cypress	City of Wolfe NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002 Hunt			NFIP/CRS 1.121004	City of Wolfe	5000																\dashv
2 R2FM50022	Low	wer Red-Sulphur-Cypress	Bowie County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002 Bowie		McKinney-Posten Bayous,Pecan- Waterhole,Lower Sulpher	NFIP/CRS 920.1022	Bowie County																	
2 R2FM50023	Low	wer Red-Sulphur-Cypress	Camp County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002 Camp		Little Cypress,Lake O'the Pines	NFIP/CRS 202.6561	Camp County																	
2	Low	wer Red-Sulphur-Cypress					Caddo Lake,White Oak Bayou,Lake O'the Pines,Cross																			
R2FMS0024 2	Low	wer Red-Sulphur-Cypress	Cass County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002 Cass		Bayou,Lower Sulpher Elm Fork Trinity,Denton,Lake	NFIP/CRS 956.7744	Cass County																	
R2FM50025			Cooke County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001. 4002 Cooke		Texoma,Farmers- Mud	NFIP/CRS 893.2448	Cooke County																	

1 of 4 LOWER RED-SULPHUR CYPRESS REGIONAL FLOOD PLAN

FMS ID RFPG No.	RFPG Name	FMS Name	Description	Associated Goals (ID)	Countes HJCRs HJCT2s Watershed Name	Project Type Strategy Project (Rivering Area (sqml) Coastal, Ur Plays Oth	ype :- :- Sponsor :	Entities with Oversight	Emergency Need (Y/N)	Estimated Funding Sources and Amount	Area in 500yr (1% annual chance) Floodplain	Estimated number of structures at 100yr flood risk	risk Flood	Critical facilities at flood risk (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	nated Estimated ber of length of roads at land at land at land at land at land at flood risk (Miles)	d Number of Structures structures structures under of 109/r118, from 100/r from 109/r118, annual chance flood chance fisk risk	Redidential Estimated structures Population of removed removed pyr from 100yr from 100yr usal (1% annual (1% annual ood chance) chance) flood risk Flood risk	Critical Aurinoer of Facilities removed from 100yr (1% annual chance)	imated length of roads removed strom 100yr urrenn (flood risk [Miles] (Miles)	atted farm chick d reduction d In fatalities of oor for available) for available)	Consideration of Nature-based removed (Y/N)	Negative Impact (Y/N) Negative Impact (Mitigation (Y/N)	Water RFPG Supply Recomme Benefit ndation (Y/N) (Y/N)	Reason for Recomme ndation
	ower Red-Sulphur-Cypress	A STATE OF THE STA		4004 4000	Sulphur Headwaters, Lower Delta Sulpher	NEIP/CBS 277.1268																		
	ower Red-Sulphur-Cypress	Delta County NFIP Involvement	Application to join NFIP or adoption of equivalent standards		Delta Sulpher East Fork Trinity, Bois D'arc-island, Sulphur	s	Delta County																	
2 Lo	ower Red-Sulphur-Cypress	Fannin County NFIP Involvement	Application to Join NFIP or adoption of equivalent standards		Fannin Headwaters, Blue Sabine, Sulphur Headwaters, White Oak Bayou, Lake O'the Pines, Lower		Fannin County																	
7MS0028 2 Lo	ower Red-Sulphur-Cypress	Franklin County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001.4002	Franklin Sulpher East Fork Trinity,80is D'arc-island,Elm Fork		Franklin County																	
2 Lo	ower Red-Sulphur-Cypress	Grayson County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002	Grayson Trinity, Lake Texoma Middle Sabine, Little	3 NFIP/CRS 976.7411	Grayson County																	
MS0030 2 Lo	ower Red-Sulphur-Cypress	Gregg County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001. 4002	Gregg Cypress Middle Sabine,Caddc Lake,Little	NFIP/CRS 273.684	Gregg County																	
7MS0031 Z Lov	ower Red-Sulphur-Cypress	Harrison County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002	Cypress,Lake O'the Harrison Pines,Cross Bayou Sabine,Sulphur Headwaters,White Oak Bayou,Lake	NFIP/CRS 912.3982	Harrison County																	
*M50032 2 Lo	ower Red-Sulphur-Cypress	Hopkins County NFIP Involvement	Application to Join NFIP or adoption of equivalent standards	4001, 4002	East Fork Trinity,Sulphur		Hopkins County																	
-MS0033	ower Red-Sulphur-Cypress	Hunt County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001.4002	Hunt ke Fork, Upper Sabint Bois D'arc- Island, Sulphur Headwaters, Pecan-	a e NFIP/CRS 879.424	Hunt County																	
MS0034	ower Red-Sulphur-Cypress	Lamar County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002	Lamar Sulpher Caddo Lake, Little	NFIP/CRS 931.7818	Lamar County																	
MS0035	ower Red-Sulphur-Cypress	Marion County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001. 4002	Marion Cypress, Lake O'the Pines Caddo Lake, White	NFIP/CRS 418.8183	Marion County																	
MS0036		Morris County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002	Oak Bayou,Lake O'the Pines,Lower Sulpher Bois D'arc-	NFIP/CRS 256.9346	Morris County																	
-MS0037	ower Red-Sulphur-Cypress	Red River County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002	Island,Pecan- Waterhole,Lower Red River Sulpher	NFIP/CRS 1055.01	Red River County																	
2 Lor -MS0038	ower Red-Sulphur-Cypress	Titus County NFIP Involvement	Application to Join NFIP or adoption of equivalent standards	4001. 4002	White Oak Bayou, Lake O'the Titus Pines, Lower Sulpher	r NFIP/CRS 425.4805	Titus County																	
2 Lo	ower Red-Sulphur-Cypress	Upshur County NFIP Involvement	Application to Join NFIP or adoption of equivalent standards	4001, 4002	Middle Sabine, Little Cypress, Lake O'the Pines Middle Sabine, Little	NFIP/CRS 590.4626	Upshur County																	
2 Lo	ower Red-Sulphur-Cypress	Wood County NFIP Involvement	Application to join NFIP or adoption of equivalent standards	4001, 4002	Cypress, Lake Fork, Upter Sabine, Lake O'the Wood Pines	NFIP/CRS 692.981	Wood County																	
2 Lo	ower Red-Sulphur-Cypress	City of Commerce CRS Involvement	Recome an NFIP Community Rating System (CRS) Community	4001, 4002	Hunt Sulphur Headwaters	s NFIP/CRS 8,35738	City of Commerce			2000														
Z Lo	ower Red-Sulphur-Cypress	City of Whitewright CRS Involvement	Become an NFIP Community Rating System (CRS) Community	4001, 4002	Fast Fork Trinity, Bols Grayson D'arc-Island	S NFIP/CRS 1.784201	City of Whitewright																	
2 Lo	ower Red-Sulphur-Cypress	Turn Around/Don't Drown	Educate public on Turn Around/Don't Drown program	1001, 1002	<null> <null></null></null>	Public Awarer <null></null>	<null></null>																	
2 Lo	ower Red-Sulphur-Cypress	Flood Safety Awareness Education	Educate public on flood safety	1001, 1002	<null> <null></null></null>	Public Awaren <null></null>	<null></null>																	
2 Lo	ower Red-Sulphur-Cypress	Public NFIP Education	Educate public on the NFIP program and the importance of purchasing flood insurance.	1001, 1002	<null> <null></null></null>	Public Awaren < Null>	<null></null>																	
2 Lo	ower Red-Sulphur-Cypress	Bowie County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003. 4004	McKinney-Posten Bayous,Pocan- Waterhole,Lower Sulpher	Regulatory an 920,1022	Bowie County																	
Z Lo	ower Red-Sulphur-Cypress	Camp County Intograted Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003, 4004	Little Cypress, Lake Camp O'the Pines	Regulatory an 202.6561	Camp County																	
	ower Red-Sulphur-Cypress	Cass County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003. 4004	Caddo Lake,White Oak Bayou,Lake O'the Pines,Cross Bayou,Lower Sulphei	er Regulatory an 956.7744	Cass County																	
	ower Red-Sulphur-Cypress	Cooke County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003, 4004	Elm Fork Trinity,Denton,Lake Texoma,Farmers- Mud		Cooke County																	
2 Lor	ower Red-Sulphur-Cypress		Create and implement an integrated stormwater management manual that contains minimum stormwater		Sulphur Headwaters,Lower																			
2 Lor	ower Red-Sulphur-Cypress		Create and implement an integrated stormwater management manual that contains minimum stormwater		East Fork Trinity,Bois D'arc-Island,Sulphur	5																		
	ower Red-Sulphur-Cypress		Create and implement an integrated stormwater management manual that contains minimum stormwater		Sabine,Sulphur Headwaters,White Oak Bayou,Lake O'the Pines,Lower																			
PMS0050 2 Lo	ower Red-Sulphur-Cypress	Delta County integrated Stormwater Management Manual Fannin County Integrated Stormwater Management Manual Franklin County Integrated Stormwater Management Manual	management manual that condains minimum stormwater of nustructure design standards Create and implement an integrated stormwater management manual that condains minimum stormwater infrustructure design standards Create and implement an integrated stormwater	4003, 4004 4003, 4004 4003, 4004	Delta Sulpher East Fork Trinity, Bold D'art-Island, Sulphur Headwater, Blue Sabine, Sulphur Headwater, White Oak Bayou, Lake	Regulatory an 277.1268	Delta County Fannin County Franklin County																	

FMS ID RFPC No.	RFPG Name	FMS Name	Description	Associated Counties HUCBs	IUC12s Watershed Nami	e Project Type Strategy Project Riverine, Area (sqiii) Cossil, Urbani Area (sqiii) Cossil, Urbani Playa Other)	c Sponsor	Entities with Emergency Estimated Oversight Need (Y/N) Project Cost I	Potential Funding Sources and Amount	Area in 500yr (0.2% annual chance) oodplain Floodplain	Estimated number of structures at 100yr flood risk	Flood Risk Estimated Criti Population facilit at flood flood risk (f	Number of low water drisk (#) risk (#)	Estimated Estir number of leng road roa closures floo (#) (M	imated active farm gth of & ranch land at od risk files) Estimated active farm food risk (acres)	Number of structures structures with reduced removed 100yr [13% from 100yr annual [13% annua chance] Flood risk risk	Number of structures removed removed from 500yr (0.2% annual d chance) Flood risk Flood risk	Reduction in Flood Risk Estimated Population removed From 100yr From 100yr	er or ater Estimated reduction of the control of th	Estimated length of roads removed from 100vr flood risk [Miles]	Estimated reduction In fatalities [if available]	Considerat ion of Nature- Structure removed Solution (Y/N)	Negative Impact (Y/N) Negative Impact Mitigation (Y/N)	Water RFPG Supply Recomme Benefit ndation (Y/N) (Y/N)	Reason for Recomme ndation
2 R2FMS0053	Lower Red-Sulphur-Cypress	Grayson County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003.4004 Grayson	East Fork Trinity,B D'arc-Island,Elm Fo Trinity,Lake Texon	ork	Grayson County																		
2 R2FMS0054	Lower Red-Sulphur-Cypress	Gregg County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003.4004 Gregg	Middle Sabine,Litt Cypress	ie Regulatory an 273.684	Gregg County																		
2 R2FMS0055	Lower Red-Sulphur-Cypress	Harrison County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003. 4004 Harrison	Middle Sabine,Cad Lake,Little Cypress,Lake O'th Pines,Cross Bayo	ie e	Harrison County																		
2 R2FMS0056	Lower Red-Sulphur-Cypress	Hopkins County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003, 4004 Hopkins	Sabine,Sulphur Headwaters,Whit Oak Bayou,Lake Fork,Lake O'the Pines,Lower Sulph		Hopkins County																		
2 R2FM50057	Lower Red-Sulphur-Cypress	Hunt County integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003. 4004 Hunt	East Fork Trinity,Sulphur Headwaters,Cedar ke Fork,Upper Sabi	La	Hunt County																		
2 R2FM50058	Lower Red-Sulphur-Cypress	Lamar County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003.4004 Lamar	Bois D'arc- Island,Sulphur Headwaters,Pecai Waterhole,Lowe Sulpher	n- r Regulatory an 931.7818	Lamar County																		
2 R2FMS0059	Lower Red-Sulphur-Cypress	Marion County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003.4004 Marion	Caddo Lake,Little Cypress,Lake O'th Pines		Marion County																		
2 R2FM50060	Lower Red-Sulphur-Cypress	Morr's County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003.4004 Morris	Caddo Lake,Whit Oak Bayou,Lake O'the Pines,Lowe Sulpher		Morris County																		
2 R2FM50061	Lower Red-Sulphur-Cypress	Red River County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003. 4004 Red River	Bois D'arc- Island,Pecan- Waterhole,Lowe Sulpher	r Regulatory an 1055.01	Red River County																		
2 R2FM50062	Lower Red-Sulphur-Cypress	Titus County integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003. 4004 Titus	White Oak Bayou,Lake O'thi Pines,Lower Sulph	er Regulatory an 425.4805	Titus County																		
2 R2FM50063	Lower Red-Sulphur-Cypress	Upshur County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003. 4004 Upshur	Middle Sabine,Litt Cypress,Lake O'th Pines	le Regulatory an 590.4626	Upshur County																		
Z R2FMS0064	Lower Red-Sulphur-Cypress	Wood County Integrated Stormwater Management Manual	Create and implement an integrated stormwater management manual that contains minimum stormwater infrustructure design standards	4003, 4004 Wood	Middle Sabine,Litt Cypress,Lake Fork,Upper Sabine,Lake O'th Pines		Wood County																		
2 R2FMS0065	Lower Red-Sulphur-Cypress	City of Sherman Emergency Alerts	Maintain and Operate Early Alert System - an outdoor warning system composed of nine sirens throughout the Cit Public announcements through reverse telephonic system a well through broadcasting local cable channels.	y. s 2001, 2002 Grayson	East Fork Trinity,Br D'arc-Island,Lake Texoma	ols : Flood Warnin 45.87181	City of Sherman																		
2 R2FMS0066	Lower Red-Sulphur-Cypress	Cooke County Warning and Emergency Response Program	Develop a community coordinated warning system and emergency response program that can detect flood threats and provide timely responses of impending flood danger.		Elm Fork Trinity,Denton,Lai Texoma,Farmers Mud		Cooke County																		
2 R2FMS0067	Lower Red-Sulphur-Cypress	City of Avery Storm Drainage Maintenance	Develop protocol for cleaning debris from ditches and drains within Avery to protect existing and new buildings	s 5003, 5004 Red River	Pecan- Waterhole,Lowe Sulpher	Preventive M. 0,665488	City of Avery																		

FMS ID	RFPG RFPG Name		Description	Associated Counties	HUC8s H	IUC12s Watershed Name Project Type	Strategy Projec Area (sqmi)	Flood Risk Type ct (Riverine, Coastal, Urban, Playa Other)		Entities with Oversight	Emergency Need (Y/N)	Estimated Project Cost (5) Potential Funding Sources and Amount	Area in 100yr (1% annual chance) Floodplain	Area in 500yr Structures at 100or risk 100ord risk 100	tical low water num ties at crossings red at flood clos risk (#) (imated more of length of roads at sources (A) (Miles) Estimated active farm to ac	Number of structures with reduced 100yr (1% annual chance) Flood o	Number of structures structures structures removed from 100yr (13% annual (0.2% annual strik) risk	Residential Estimated structures Population removed removed from 100yr from 100yr [1% annual (1% annual chance) chance) Flood risk Flood risk	Critical facilities removed from 100yr (1% annual chance) Flood risk	Estimated reduction in road closure occurrences (Miles)	Estimated active farm & ranch land removed from 100yr flood risk	Estimated reduction in injuries [if available)	Considerat ion of Nature-based Solution (Y/N)	Negative Water Impact Supply Mitigation Benefit (Y/N) (Y/N)	REPG Reason for Recomme ndation (Y/N)
R2FM50068	2 Lower Red-Sulphur-Cypress	Cley of Clarksville Storm Drainage Maintenance	8i-Annual storm drainage cleaning program to be implemented to keep debris from hampering drainage	5003, 5004 Red River		Lower Sulpher Preventive N	1; 2.8777	18 0	City of Clarksville											(#) 1m1		(acres)				
R2FMS0069	2 Lower Red-Sulphur-Cypress	City of Commerce Storm Drainage Maintenance	Activate Sulphur River clean-up efforts in order to prevent flooding from buildup of debris.	5003, 5004 Hunt		Sulphur Headwaters Preventive N	1, 8.3573	18 0	City of Commerce			1000000														
R2FMS0070	2 Lower Red-Sulphur-Cypress	City of Daingerfield Storm Drainage Maintenance	Bi-Annual storm drainage cleaning program to be implemented to keep debris from hampering drainage	5003. 5004 Morris		Lake O'the Pines Preventive N	1, 2,722751	.a c	City of Daingerfield																	
R2FMS0071	2 Lower Red-Sulphur-Cypress	City of Denison Storm Drainage Maintenance	BI-annual storm drainage cleaning program to be implemented to keep debris from hampering drainage	5003. 5004 Grayson		Bois D'arc-island,Lake Texoma Preventive N	1: 29.0529	19 0	City of Denison																	
R2FMS0072	2 Lower Red-Sulphur-Cypress	City of Dorchester Storm Drainage Maintenance	As development and construction continue, keep waterways clean and clear of obstruction for proper flow. Continued upkeep for erosion control and water flow.	5003. 5004 Grayson		East Fork Trinity, Bois D'arc-Island, Elm Fork Trinity Preventive N	1, 0.09515	52 0	City of Dorchester																	
R2FMS0073	2 Lower Red-Sulphur-Cypress	City of Ladonia Storm Drainage Maintenance	Bi-annual storm drainage cleaning program to be implemented to keep debris from hampering drainage	5003, 5004 Fannin		Sulphur Headwaters Preventive N	1.67720	n c	City of Ladonia																	
R2FMS0074	2 Lower Red-Sulphur-Cypress	City of Southmayd Storm Drainage Maintenance	Routinely inspect and clear debris from drainage systems. To conduct clearing activities, the city would require purchasing/renting backhoe to help with drainage ditches, retention tanks, etc	5003, 5004 Grayson		Bois D'arc-island,Lake Texoma Preventive N	1. 2,79391!	9 0	City of Southmayd																	
R2FMS0075	2 Lower Red-Sulphur-Cypress	City of Trenton Storm Drainage Maintenance	Improvements and clearing of storm drainage system to reduce the impact of heavy rain events.	5003. 5004 Fannin		East Fork Trinity,Bois D'arc-Island Preventive N	1; 0.37870	м с	City of Trenton																	
R2FMS0076	2 Lower Red-Sulphur-Cypress	Fannin County Stream Maintenance	Regular maintenance, such as sediment and debris clearance is needed so that the stream or waterway may carry out its designed function.	5003, 5004 Fannin		East Fork Trinity,Bois D'arc-Island,Sulphur Headwaters,Blue Preventive N	1 897.031	.5 F	annin County																	
R2FMS0077	2 Lower Red-Sulphur-Cypress	Gregg County Storm Drainage Maintenance	Monitor flood-prone areas and remove debris from drainage culverts when needed to alleviate potential flooding hazards.	5003. 5004 Gregg		Middle Sabine, Little Cypress Preventive N	1, 273.68	14 0	Gregg County																	
R2FMS0078	2 Lower Red-Sulphur-Cypress	City of Ector Property Bayout	Acquire flood prone properties for use as park areas.	5001, 5002 Fannin		Bois D'arc-Island Property and	1.16826	ia c	City of Ector																	
R2FMS0079	2 Lower Red-Sulphur-Cypress	City of Longview Property Buyout	Purchase properties in floodplain areas to reserve them from development Purchase and removal of damaged homes that are located in the floodplain. These homes are currently a hazard to the	5001, 5002 Gregg		Middle Sabine, Little Cypress Property and Elm Fork	0.02426	7 Urban C	City of Longview			15600000														
R2FMS0080	2 Lower Red-Sulphur-Cypress	Cooke County Acquisition of Repetitive Loss and Damaged Properties	community and pose even large threat of danger if a large rain event were to happen before removal (NFIP). Buyout of repetitive flood loss Work with local jurisdiction in the buyout of repetitive flood	5001, 5002 Cooke		Trinity,Denton,Lake Texoma,Farmers- Mud Property and	893.244	18 0	Cooke County			RFL Grant														
R2FMS0081	2 Lower Red-Sulphur-Cypress	Grayson County Buyout of Repetitive Flood Properties	properties. This includes any structures found to be located i flood areas that are in incorporated and unincorporated areas.	5001, 5002 Grayson		East Fork Trinity,Bois D'arc-island,Elm Fork Trinity,Lake Texoma Property and Middle Sabine,Caddo	976.741	1 0	Grayson County																	
R2FMS0082	2 Lower Red-Sulphur-Cypress 2 Lower Red-Sulphur-Cypress	Harrison County Property Acquisition	Acquisition and management strategies of land to preserve open space for flood mitigation and water quality in the flood plain.	5001. 5002 Harrison		Lake,Little Cypress,Lake O'the Pines,Cross Bayou Property and East Fork Trinity,Bois	912.398	12 F	Harrison County																	
R2FMS0083	Lower Red-Sulphur-Cypress	Grayson County Flood Warning and Public Safety Improvements	Create improved gauge notification system. Increase public awareness prior to occurrences and during flooding. Establish a floodplain manager for the city to regulate	2001, 2002 Grayson		East Fork Trinity,Bois D'arc-Island,Elim Fork Trinity,Lake Texoma Public Aware	976.741	1 6	Grayson County																	
R2FMS0084		City of Bonham Floodplain Manager	floodplain development and provide public information concerning flood areas.	4001, 4002 Fannin		Bois D'arc-Island Regulatory a	n 9.6717	3 0	City of Bonham																	
R2FMS0085	2 Lower Red-Sulphur-Cypress	City of Longview Flood Mitigation Training	Seek state and FEMA sponsored training in flood mitigation for key personned. Apply for assistance in establishing a Certified Countywide Floodplain Manager position. Funding on the continuation of the position would be from permit fees and local budgets.	5003. 5004 Gregg		Middle Sabine, Little Cypress Regulatory a East Fork Trinity, Bols	n 0.02426	57 C	City of Longview			\$2,000/year														
R2FMS0086	2 Lower Red-Sulphur-Cypress	Fannin County Floodplain Manager	The focus of this role would be to miligate flooding and protect the flood Raise electrical panels and connections on lift stations above	4001, 4002 Fannin		D'arc-Island,Sulphur Headwaters,Blue Regulatory a	n 897.031	5 F	annin County																	
R2FMS0087		City of Sadler Lift Station Flood-Proofing	expected flood levels in flood prone areas.	5003, 5004 Grayson		Lake Texoma Property Acc	1.05438	11 0	City of Sadler																	



Attachment 6

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

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ID	Community	County	Source Name	Source Type	Source Date	Project Title	Project Location	Project Type	Project Description	Project Cost	Maintenance Cost	Current Level of Service	Proposed Level of Service	Benefit-Cost Ratio	Drainage Area Greater than 1sm	Rainfall Data
							•									

LOWER RED-SULPHUR-CYPRESS REGIONAL FLOOD PLAN

DRAFT FOR PUBLIC REVIEW

ID	Step 0 Screening: Already completed?	Step 1 Screening: FMP	Step 1 Screening: FME	Step 1 Screening: FMS	Step 1 Screening: Disqualified due to: Not a flood problem with DA > 1 sm	Disqualified due to: Does not reduce 100-year	to: Does not meet	Step 2 Screening: Structural FMP	Step 2 Screening: Non-Structural FMP	Step 2 Screening: FME	Step 2 Screening: FMS	Step 2 Screening: H&H model available?	Step 2 Screening: Is there sufficient data?	Step 2 Screening: Has negative impact?

2 of 2



Attachment 7

Task 4C — Geodatabase (provided in digital format only)