Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

October 24, 2022

Lauren Willis
Director of Regulatory & Customer Affairs
Guadalupe-Blanco River Authority
933 E. Court St.,
Seguin, TX 78155

RE: Texas Water Development Board Comments on Region 11 Guadalupe RFPG's Draft Regional Flood Plan Contract No. 2101792496

Dear Ms. Willis,

Texas Water Development Board (TWDB) staff has performed a review of the draft regional flood plan submitted by August 1, 2022, on behalf of the Region 11 Guadalupe Regional Flood Planning Group (RFPG). The attached comments will follow this format:

- **LEVEL 1**: Comments and questions that must be satisfactorily addressed to meet specific statute, rule, or contract requirements; and,
- **LEVEL 2**: Comments and suggestions for consideration that may improve the readability and/or overall understanding of the regional flood plan

Please note that while Level 2 comments are provided for the planning group's consideration, Level 1 comments must be addressed prior to the submission of final Regional Flood Plans by the January 10, 2023, deadline.

It is expected that the data contained in all written report sections, tables, excel spreadsheets, and the geodatabase will be consistent with each other. In cases where there are any discrepancies in data, the geodatabase dataset will supersede other data and the TWDB will utilize the geodatabase dataset when developing the state flood plan.

TWDB review of the draft regional flood plans is comprised of many spot checks of data across several deliverables and is not an all-encompassing review. Please note that TWDB's review does not imply accuracy of the entire draft regional flood plan, and the RFPG is responsible for ensuring the completeness and accuracy of all data.

To facilitate efficient and timely completion, and Board approval, of your final regional flood plan, please provide your TWDB Regional Flood Planner with a draft of your response to these comments (e.g., informally via email) on the draft RFP as soon as possible. This will allow TWDB staff to provide preliminary feedback on proposed RFPG responses to assist you in meeting your RFPG's timeline for approval and submission to TWDB of the final plan by the deadline. It will also help to minimize the need for subsequent follow-ups after final regional flood plan submission to TWDB.

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Title 31 TAC §361.50(c) requires the regional flood planning group to consider any written or oral Comment received from the public on the draft regional flood plan (RFP); and the EA's written comment on the draft RFP prior to adopting a final RFP. Section 361.50(d) requires the final adopted plan include summaries of all timely written and oral comments received, along with a response, for each, explaining any resulting revisions or why changes are not warranted. Copies of TWDB's Level 1 and 2 written comments and the RFPG's responses must be included in the final, adopted RFP. While the comments included in this letter represent TWDB's review to date, please anticipate the need to respond to additional comments or questions, as necessary, regarding data integrity related to the Board's State Flood Plan Database (that is built from the 15 regional databases), even after submission of the final plan to TWDB.

Standard to all RFPGs is the need to include certain content in the final RFPs that was not yet available at the time that drafts were prepared and submitted. In your final RFP, please be sure to incorporate in the final submitted plan, documentation, for example, that a public meeting to receive comments was held as required and that comments received on the draft RFP were considered in the development of the final plan [31 TAC §361.50(d)].

If you have any questions regarding these comments or would like to discuss your approach to addressing any of these comments, please do not hesitate to contact Ryke Moore at 512-475-1564 or via email at Ryke.Moore@twdb.texas.gov. TWDB staff are available to assist you in any way possible to ensure successful completion of your final regional flood plan.

Lastly, on behalf of TWDB, I would like to thank you, the sponsor, the RFPG members and the technical consultants for accomplishing this major milestone of a herculean effort and advancing the flood risk reduction mission in our state.

Sincerely,

Reem J. Zoun, PE, CFM, ENV SP
Director
Flood Planning

Attachment: TWDB Comments

Cc: Doug Miller, RFPG Chair
Jay Scanlon, Freese and Nichols
Adam Conner, Freese and Nichols
Matt Nelson, TWDB
James Bronikowski, TWDB
Anita Machiavello, TWDB
Ryke Moore, TWDB

October 24, 2022

TWDB Comments on Region 11 Guadalupe Regional Flood Planning Group's Draft Regional Flood Plan

Level 1: Comments and questions must be satisfactorily addressed to meet statutory, agency rule, and/or contract requirements.

General Comments

1. Please ensure that all "Submittal requirements" identified in each of the Exhibit C Guidance document sections are submitted in the final flood plan.

SOW Task 1

2. Entities GIS Feature Class, *Entities*: It appears that some fields contain invalid entries, including 'ACTIVE'. Please leave NULL to represent either "not applicable" or "unknown". Please review fields, as appropriate, and populate with valid entries as referenced in Exhibit D Table 3 [31 TAC §361.30(4) & (5)].
3. Existing Flood Projects GIS Feature Class, *ExFldProjs*:
    a. Please refrain from using numeric placeholders (such as "999999") in numeric fields such as 'COMP_YR' as this causes errors in calculations.
    b. Please include the expected year of completion for all ongoing projects in the 'COMP_YR' field. Please leave NULL to represent either "not applicable" or "unknown". Please populate all required fields with valid entries per Exhibit D Table 8 [31 TAC §361.32].
4. Existing Flood Infrastructure GIS Feature Class, *ExFldInfraPt*: Please include all low water crossings (LWCs) identified during the flood planning process in this feature class. The *ExFldExpAll* feature class appears to contain LWCs that are not included in the *ExFldInfraPt* feature class. Note: This is required in contrast to the optional *LWC* feature class. Please reconcile [31 TAC §361.31].

SOW Task 2A

5. Existing Condition Flood Hazard GIS Feature Class, *ExFldHazard*: The Total Hazard Area in Table 3 and the *ExFldHazard* feature class do not appear to match for "Possible flood prone areas" and "Unknown" flood risks. Please review for accuracy. Please ensure that the hazard area in Table 3 matches the area in *ExFldHazard* [31 TAC §361.33(b)].
6. Existing Condition Flood Hazard Analysis, Text: Please include total land areas (square miles) of each flood risk by flood risk type, county, region, and frequency as per guidance document (Exhibit C page 24): Submittal requirement number 2 [31 TAC §361.33(a)].
7. Existing Condition Flood Vulnerability GIS Feature Class, *ExFldExpAll*:
    a. Please check that the population count in Table 3 is the maximum of day and night population. The population count in Table 3 does not appear to match either the total day population or total night population from the *ExFldExpAll* feature class and appears to be higher than both. "Population (daytime)" and "Population (nighttime)" columns are not included in the table but can be added to the left of "Population" in Table 3 to facilitate this check.

   b. Please use the updated 'CRIT_TYPE' valid entry list: "Medical, Police, Fire, EMS, Shelter, School, Infrastructure, Water Treatment, Wastewater Treatment, Power Generation, Other". The entry "Emergency" has been removed from the list of valid entries. Please refer to the Summary of Updates to Exhibit D document available on the TWDB website.
   c. If the 'CRITICAL' field contains a 'No' entry, then please leave 'CRIT_TYPE' as NULL [31 TAC §361.33(c)].
8. Model Coverage GIS Feature Class, *ModelCoverage*:
   a. It appears that several entries for 'MODEL_NAME' include "Data.gdb", "unknown", or other non-unique names. Please reconcile.
   b. It appears that 'MODEL_DESCR' for some entries do not describe the model or scenario modeled. Please include a description of the model and the scenario modeled in 'MODEL_DESCR'. Please review and revise for accuracy [31 TAC §361.33(b)(2)].

SOW Task 2B

9. Future Condition Flood Hazard Analysis, Text: Please include total land areas (square miles) of each flood risk by flood risk type, county, region, and frequency as required (Exhibit C page 33): Submittal requirement number 3 [31 TAC §361.34].
10. Future Condition Flood Exposure Table (Exhibit C Table 5): There appears to be a discrepancy between counts in the *FutFldExpAll* feature class (366 structures in the 1% annual chance flood risk) and the Table 5 values (362 structures in the 1% annual chance flood risk) for Blanco County. Please reconcile [31 TAC §361.34 & Exhibit C 2.2.B.3].
11. Future Condition Flood Vulnerability GIS Feature Class, *FutFldExpAll*:
    a. Please use the updated 'CRIT_TYPE' valid entry list: "Medical, Police, Fire, EMS, Shelter, School, Infrastructure, Water Treatment, Wastewater Treatment, Power Generation, Other". The entry "Emergency" has been removed from the list of valid entries. Please refer to the Summary of Updates to Exhibit D document available on the TWDB website.
    b. For 'CRITICAL' fields containing a 'No' entry, then please leave 'CRIT_TYPE' as NULL [31 TAC §361.33(c)].

SOW Task 3B

12. Goals Table (Exhibit C Table 11): Table 11 appears to be missing fields for "Residual Risk" and "How will the Goal be Measured". Please add and populate these required fields for Table 11 [31 TAC §361.36 & Exhibit C 2.3.B].

SOW Task 4B

13. Flood Management Evaluations (FME) GIS Feature Class, *FME*:
    a. Please refrain from using numeric placeholders (such as '999999') in numeric fields such as 'STRUCT_100' as this causes errors in calculations. Please leave NULL when the field is not applicable or unknown.
    b. It appears that some fields contain invalid entries, including 'FUND' and 'REGULATORY'. Please review certain fields, as appropriate, and populate with valid entries as referenced in Exhibit D Table 23. Please leave NULL when the field is not applicable or unknown [31 TAC §361.38(i) & Exhibit D 3.10].

14. Flood Mitigation Projects (FMP) GIS Feature Class, *FMP*: Please refrain from using numeric placeholders (such as '999999') in numeric fields such as 'STRUCT_100' as this causes errors in calculations. Please leave NULL when the field is not applicable or unknown [31 TAC §361.38(c-e) & Exhibit D 3.11.1].
15. Flood Mitigation Projects (FMP) Table (Exhibit C Table 13): The format of Associated Goals (ID) for FMP_ID 113000035 appears to be set to scientific number formatting and is currently shown as "1.1 E+14". Please update to reflect the required GOAL_ID format as required in Exhibit D Table 2 [31 TAC §361.38(c-e) & Exhibit C 2.4.B].
16. Flood Management Strategies (FMS) GIS Feature Class, *FMS*:
    a. It appears that some fields contain invalid entries, including 'FUND' and 'FMS_COST'. Please consider reviewing certain fields, as appropriate, and populate with valid entries as referenced in Exhibit D Table 26. Please leave NULL when the field is not applicable or unknown.
    b. Please refrain from using numeric placeholders (such as '999999') in numeric fields such as 'STRUCT_100' as this causes errors in calculations. Please leave NULL when the field is not applicable or unknown [31 TAC §361.38(d) & Exhibit D].
19. Flood Management Strategy (FMS) Recommendations Table (Exhibit C Table 17):
    a. The Nonrecurring, Noncapital Cost field appears to be missing. Please add and populate this field in Table 17 to match the amounts in the 'NRNC_COST' field entries in the *FMS* feature class.
    b. Some FMSs list $0 for the Estimated Total Strategy Cost field. Please make sure this field at least matches the amounts contained in the Nonrecurring, Noncapital Cost field [31 TAC §361.39 & Exhibit C 2.5.C].

<u>SOW Task 5</u>

20. Flood Management Evaluation (FME) Recommendations GIS Feature Class, *FME:* Please refrain from using numeric placeholders (such as '999999') in numeric fields such as 'STRUCT_100' as this causes errors in calculations. Please leave NULL when the field is not applicable or unknown [31 TAC §361.39(c), (f) & Exhibit D 3.10].
21. Flood Mitigation Project (FMP) Recommendations, Text:
    a. Each recommended FMP must be accompanied with an associated model or supporting documentation to show no negative impact. Please confirm that this was done and provide reference to supporting materials. As per the draft report (page 6-2), "*The RFPG reviewed previous assessments of impact to upstream or downstream areas or neighboring regions, and deferred to the professional engineering judgement expressed in those assessments to determine whether no negative impact exists.*" For each recommended FMP, please identify in the plan how no negative impact was determined as required by the Exhibit C Section 3.6.A (page 108), either via a model or a study, and submit the associated model, include the study name, or identify previous assessment name and associated engineering judgement in tabular format.
    b. It appears that the cost for FMP_ID 113000001 in Table 5-2 does not match what is in the *FMP* feature class and Table 16. Please reconcile [31 TAC §361.39 & Exhibit C 2.5.B].
22. Flood Mitigation Project (FMP) Recommendations GIS Feature Class, *FMP*:
    a. Please refrain from using numeric placeholders (such as '999999') in numeric fields such as 'STRUCT_100' and 'BC_RATIO' as this causes errors in calculations. Please

leave NULL when the field is not applicable or unknown [31 TAC §361.38(c-e) & Exhibit D 3.11.1].

b. It appears that some fields are missing entries, including 'BC_RATIO'. Please ensure all required fields are populated with valid entries per Exhibit D Table 24.

23. Flood Management Strategy (FMS) Recommendations, Text: The cost in Table 5-3 "Education and Outreach" does not appear to not match the costs included in the *FMS* feature class. Please reconcile [31 TAC §361.39 & Exhibit D 3.11.1].

SOW Task 6B

24. Contributions to and Impacts on Water Supply Development and the State Water Plan, Text:
    a. Section 6.2.5 notes that the plan does not include recommended FMSs or FMPs for large detention structures that will have a water supply component. However, Table 16 appears to indicate that several recommended FMPs with detention components may have a water supply benefit. “Ordinances and Criteria”, “Recharge Enhancement” and other subsections appear to also describe potential water supply benefits. Please clarify which recommended FMSs or FMPs would measurably contribute to water supply if implemented and, if appropriate, include a single table that lists all recommended FMSs or FMPs that would measurably contribute to water supply and provides the information outlined in Exhibit C Section 2.6.B.
    b. The plan does not appear to present a summary of negative impacts of the flood plan on the state water plan. Please provide a summary of negative impacts of the flood plan on the state water plan and a table listing recommended FMSs and FMPs that would negatively impact or measurably reduce water availability volumes or water supply volumes in accordance with Exhibit C, Section 2.6.B. If no negative impacts are identified, please include a statement to that effect [31 TAC §361.41 & Exhibit C 2.6.B].

SOW Task 7

25. Flood Response Information and Activities, Text: The plan does not appear to contain a written summary in Chapter 7 of entities involved and actions taken or planned for recovery from past flood disasters in the region. Please reconcile [31 TAC §361.42 & Exhibit C 2.7].

Level 2: Comments and suggestions for consideration that may improve the readability and overall understanding of the regional flood plan.

General Comments

26. Please consider including appropriate bookmarks in the pdf of the report.

SOW Task 1

27. Planning Area Description, Text: Please consider providing a summary for agricultural and natural resources specific to Region 11 that are most impacted by flooding.
28. Existing Flood Infrastructure, Text: Please provide a description of how Low Water Crossings were identified within the text of Chapter 1.
29. Deficient Infrastructure Map (Exhibit C Map 3): Please consider modifying the color scheme to help differentiate between tributaries, rivers, and infrastructure lines on the map.

SOW Task 2A

30. Existing Condition Flood Exposure, Text: Please consider updating the naming convention for Table 2-3 and 2-4 in the text when describing exposure between the 1% and 0.2% events. Currently the exposure from the 1% and 0.2% are added together for the "TOTAL" count. From the values the 0.2% field includes "Additional structures" exposed, rather than "Total structures" impacted by the 0.2% event.
31. Existing Condition Flood Exposure Table (Exhibit C Table 3): Please consider adding an additional column of "Total Exposure" that adds 1% and 0.2% exposure values in Table 3. As presented, it is unclear what values are being used to create the rankings of counties with the most exposure.
32. Existing Condition Flood Exposure GIS Feature Class, *ExFldExpLn*: It appears that this feature class contains several extremely short road segments (<0.05 meters). Please consider merging and consolidating these together to reduce the number of features.
33. Existing Condition Flood Vulnerability, Text: Please consider providing further descriptions on how vulnerability was assessed. Consider providing more details about if proximity to a floodplain, proximity to other bodies of water, past flooding issues, emergency management plans, and location of critical systems like primary and back-up power were assessed.
34. Existing Condition Flood Vulnerability GIS Feature Class, *ExFldExpAll*: Page 2-16 of the text mentions electrical facilities, however, there doesn't appear to be any power generation or related facilities included in this feature class. Please consider including power generation and related facilities in the *ExFldExpAll* feature class.
35. Model Coverage GIS Feature Class, *ModelCoverage*: For BLE mapping coverage areas please consider labeling 'MODEL_NAME' with "ESTBFE <Model date>" and the 'MODEL_DESCR" field with "Base Level Engineering model".

SOW Task 2B

36. Future Condition Flood Exposure, Text:
    a. Please consider clarifying the sentence on Page 2-13, "Then, additional building footprints within the future condition floodplains were generated for the future condition flood exposure analysis." It appears unclear whether additional building footprints were added to approximate areas through some logical methodology and then counted if they intersect with the future condition flood hazard floodplain, or if those footprints were all added to the projected future condition flood hazard floodplain directly.
    b. Please consider including in the text on Pages 2-13 and 2-14 the estimated number of occupants used for these additional future buildings.
37. Future Condition Flood Exposure GIS Feature Class, *FutFldExpLn*: It appears that this feature class contains several extremely short road segments (<0.05 meters). Please consider merging and consolidating these together to reduce the number of features.
38. Future Condition Flood Vulnerability, Text: Please consider providing further descriptions on how vulnerability was assessed. Consider providing more details about if proximity to a floodplain, proximity to other bodies of water, past flooding issues, emergency management plans, and location of critical systems like primary and back-up power were assessed.

SOW Task 4B

39. Flood Management Evaluations (FME), Text:
    a. Please consider reviewing and comparing FMEs with TWDB-funded, FIF Projects 40085, 40012, and 40133. Please verify whether there are capital costs with FME_ID 111000138 Cypress Regional Detention. If capital costs are included, please review and consider if this FME should be classified as an FMP. If this is a study, please add additional description to the text and geodatabase to clarify the study need and alignment with flood risk reduction.
    b. For county-wide FMEs where most of the county falls outside of the RFPG boundary, please include justification of how the FME benefits the region and please coordinate with other RFPGs to make sure the efforts are not duplicated.
40. Flood Management Evaluations (FME) Map (Exhibit C Map 16): Please consider including TWDB-funded, FIF Category 1 studies in the indication of previously studied areas.
41. Flood Mitigation Projects (FMP) GIS Table, *FMP_HazPost*: Please consider developing an *FMP_HazPost* feature class showing an updated hazard area that accounts for the impact of recommended FMPs.

SOW Task 5

42. Flood Management Evaluation (FME) Recommendations, Text:
    a. Please consider organizing Table 5-1 by increasing ID number.
    b. For projects that overlap with an existing TWDB-funded, FIF Category 1 Study, please state how the FME will expand on the existing study. Examples include but are not limited to FME_IDs 11100098, 111000126, and 11100003. TWDB-funded FIF Projects 40085, 40012, and 40133 should be reviewed.
43. Flood Mitigation Projects (FMP) Details GIS Table, *FMP_Details*: 'FMP_COST' values appear to be rounded differently within same field (some to decimal, some to dollar). Please consider using consistent approaches to rounding.

SOW Task 9

44. Flood Infrastructure Financing, Text: For clarity, please consider providing additional details regarding the "other means of collecting the required information" for the survey.

Summary of Updates to Exhibit D

Updates to Exhibit D: Data Submittal Guidelines for Regional Flood Planning

This document summarizes the updates for Exhibit D: Data Submittal Guidelines for Regional Flood Planning.

Note: For a complete listing of the geodatabase structure with changes since July 2021 highlighted, please see this link.

The GDB Templates on the Flood Data Hub have also been updated.

The Table of Changes section lists all changes from August 2021 to March 2022 which affect feature class specifications or the Unique ID Guidance table.

The Additional Guidance section includes items that are not reflected in the feature class specifications or Unique ID guidance.

Contents

Table of Changes Since July 2021

The following table shows all changes since July 2021 affecting the feature class specifications/templates as well as the Unique ID Guidance table. After the first three items, they are listed in Exhibit D order.

For specifications for added fields and feature classes, see later sections as well as the complete listing of the geodatabase structure with highlighted changes here.

Table 1 Summary of Changes

Date	Exhibit D		Feature Class/Table	Field	Description of Change
	Section	Table #			
1/31/22			ModelCoverage		Feature class added
3/10/22			Fut_Map_Gaps		Feature class added
3/10/22	3.5.1.1	10	Fld_Map_Gaps		Feature class renamed to Ex_Map_Gaps
2/28/22	3	2	Unique ID Guidance	EXHAZ_ID	Length increased: "Region No. + 10 Digits"
2/28/22	3	2	Unique ID Guidance	FUTHAZ_ID	Length increased: "Region No. + 10 Digits"
4/12/22	3	2	Unique ID Guidance	GAPS_ID	Renamed to EXGAPS_ID
4/12/22	3	2	Unique ID Guidance	FUTGAPS_ID	Entry added with guidance: "Region No. + 6 Digits"
4/12/22	3	2	Unique ID Guidance	MODEL_ID	Entry added with guidance: "Region No. + 10 Digits"
12/3/21	3.2	4	Watersheds	FME_ID	Field added
12/3/21	3.2	4	Watersheds	EXPROJ_ID	Field added
12/3/21	3.2	4	Watersheds	FMP_ID	Field added
12/3/21	3.2	4	Watersheds	FMS_ID	Field added
3/10/22	3.3.1	5	ExFldInfraPol	INFRA_TYPE	Valid entry added: Reservoir
3/10/22	3.3.3	7	ExFldInfraPt	INFRA_TYPE	Valid entry added: Inlet
12/3/21	3.4	8	ExFldProjs	SOURCE	Field added
3/10/22	3.5.1.1	10	Ex_Map_Gaps	GAPS_ID	Field renamed to EXGAPS_ID
10/18/22	3.5.1.1	10	Ex_Map_Gaps	REASON	Field added

3/28/22	3.5.1.1	10	Ex_Map_Gaps	FLOOD_FREQ	Correction: Valid entry list moved from WS_ID to FLOOD_FREQ
3/28/22	3.5.1.1	10	Ex_Map_Gaps	WS_ID	Correction: Valid entry list moved from WS_ID to FLOOD_FREQ
4/12/22	3.5.2.2	12	ExFldExpLn	POP_DAY	Changed to NOT required
4/12/22	3.5.2.2	12	ExFldExpLn	POP_NIGHT	Changed to NOT required
4/12/22	3.5.3	14	ExFldExpAll	CRIT_TYPE	Valid entry removed: Emergency
4/12/22	3.5.3	14	ExFldExpAll	CRIT_TYPE	Valid entries added: Police, Fire, EMS, Water Treatment, Wastewater Treatment, Power Generation
4/12/22	3.5.3	14	ExFldExpAll	CRIT_DESC	Field Added
4/12/22	3.6.3	19	FutFldExpAll	CRIT_TYPE	Valid entry removed: Emergency
4/12/22	3.6.3	19	FutFldExpAll	CRIT_TYPE	Valid entries added: Police, Fire, EMS, Water Treatment, Wastewater Treatment, Power Generation
4/12/22	3.6.3	19	FutFldExpAll	CRIT_DESC	Field Added
1/31/22	3.10	23	FME	MODEL_ID	Field added
12/3/21	3.11.1	24	FMP	SOURCE	Field added
1/31/22	3.11.1	24	FMP	MODEL_ID	Field added
12/14/22	3.12	26	FMS	NRNC_COST	Field added
1/31/22	3.12	26	FMS	MODEL_ID	Field added

Additional Guidance

1. In the infrastructure feature classes, owner and operator are required fields. In the case of no owner or operator, such as for natural features, please use the code “999999” to indicate that this field is intentionally left “blank”.
2. In the FMP and ExFldProjs feature classes, it is the intent that the feature shapes show the project area while the associated Watersheds show all the affected drainage area *including contributing drainage area*. The watershed ID field in the FMP and ExFldProjs feature classes must be filled with associated watersheds in this case.
3. Maps should be of a size that could be printed if desired, such as 11x17 or 36x36. Maps are expected to be PDFs in the flood plan with supporting GIS data supplied, such as Pro/ArcMap “workmaps” with supporting shapefiles or feature classes.
4. All digits of the Unique ID strings should be numeric.

Specifications for Additional Feature Classes

Model Coverage [ModelCoverage]

Description:

The ‘ModelCoverage’ polygon feature class identifies models which are relevant to the region’s FMP, FMS, or FMEs. This includes models that are used to determined negative impact. Each model should be represented with a polygon showing the coverage of the model.

List of Fields for ‘ModelCoverage’

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Model ID	Y	MODEL_ID	Text	The two-digit region code, followed by a unique 10-digit numerical identifier, for a total of 12 digits.	
	Y	MODEL_NAME	Text		
	Y	MODEL_DESCR	Text	Description of model including scenario modeled	
RFPG	Y	RFPG_NUM	Short (2)	RFPG number	
	Y	RFPG_NAME	Text		

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Model Descriptors	Y	MODEL_TYPE	Text		Hydraulic, Hydrologic, Coastal, Combined Riverine-Coastal, 2D, Risk Assessment, Economics/BCA, Other, Unknown
	N	MODEL_SOFTW	Text	Software used, such as "HEC-RAS"	HEC-RAS, HEC-HMS, HEC-GeoHMS, HEC-WAT, HEC-EFM, HEC-MetVue, HEC-SSP, RiverWare, Infoworks ICM, SWMM, InfoSWMM, XPSWMM, XPStorm, ICPR, OpenFlows StormCAD, OpenFlows CivilStorm, OpenFlows FLOOD, OpenFlows CulvertMaster, ADCIRC, WHAFIS, SWAN, MIKE 21, FEMA Hazus, FEMA BCA, HEC-FDA, HEC-FIA, Hydro-CAD, HY-8 Culvert, Delft3D, SWAT, PRMS, WRAP, EPANET, FLO-2D, Other, Unknown
	N	SOFTW_VERS	Text	Version of software	
Date	N	LAST_UPDATE	Date		
	N	CREATE_DATE	Date		

Guidelines:

Identify all models used in the flood planning process, including those for determining negative impact.

Future Flood Mapping Gaps [Fut_Map_Gaps]

Description:

A polygon feature class identifying future gaps in inundation boundary mapping.

List of Fields for 'Fut_Map_Gaps'

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Flood Mapping Gap	Y	FUTGAPS_ID	Text	Must be unique for each feature	

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
RFPG	Y	RFPG_NUM	Short (2)	RFPG number	
	Y	RFPG_NAME	Text		
Counties	Y	COUNTY	Text	County name, without "County" (e.g., “Harris”, not “Harris County”); comma-separated if multiple.	
HUC8s	Y	HUC8	Text	NHD HUC8 numbers, comma-separated	
HUC10s	N	HUC10	Text	NHD HUC10 numbers, comma-separated	
HUC12s	N	HUC12	Text	NHD HUC12 numbers, comma-separated. May be left blank if too many for field length.	
Watersheds	N	WS_ID	Text	WS_IDs from Watershed feature, comma-separated. May be left blank if too many for field length.	
Annual Probability	Y	FLOOD_FREQ	Text	Annual probability of occurrence	10, 4, 1, 0.2, Unknown
Entities with Oversight	Y	ENTITY_ID	Text	ENTITY_ID from Entity feature class, comma-separated if multiple	
Associated FMEs	N	FME_ID	Text	IDs from FME features, comma-separated. This optional field is intended to identify cases where there is an associated FME.	
Hazard Map Date	N	MAP_DATE	Date	The date the hazard map was produced, if applicable	
Reason Description	Y	REASON	Text	The reason that this gap is specified	

Guidelines:

Future flood mapping gaps are areas anticipated to be with insufficient or outdated mapping data. Existing maps covering the area may be or become out of date or be lacking in analytical

rigor. The minimum feature size is one watershed, which should be no smaller than one square mile. RFPGs are to utilize their own discretion to decide which maps are outdated since this will depend on various factors including but not limited to date of existing H&H models and mapping, change of land use and impervious cover in the area, change in rainfall pattern and availability of updated hydrology information.

Specifications for Additional Fields

In this section, added fields are grouped by feature class. Please note that other types of field changes are not listed here and can be found in the Table of Changes section and also in this document which lists the complete geodatabase specification with highlighted changes.

Watersheds [Watersheds]

These fields have been added to the Watersheds feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Associated FMEs	N	FME_ID	Text	IDs from FME features, comma-separated. This optional field is intended to identify cases where there is an associated FME.	
Associated FMSs	N	FMS_ID	Text	IDs from FMS features, comma-separated. This optional field is intended to identify cases where there is an associated FMS.	
Associated FMPs	N	FMP_ID	Text	IDs from FMP features, comma-separated. This optional field is intended to identify cases where there is an associated FMP.	
Existing Project	N	EXPROJ_ID	Text	IDs from Existing Project features, comma-separated. This optional field is intended to identify cases where there is an associated Existing Project.	

Proposed and Ongoing Flood Mitigation Projects [ExFldProjs]

This field has been added to the ExFldProjs feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Planning Study or Document Name	N	SOURCE	Text	Can be used to connect project to originating document such as such as a city or county master plan	

Existing Flood Mapping Gaps [Ex_Map_Gaps]

This field has been added to the Ex_Map_Gaps (formerly Fld_Map_Gaps) feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Reason Description	Y	REASON	Text	The reason that this gap is specified	

Flood Management Evaluation [FME]

This field has been added to the FME feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Model ID	N	MODEL_ID	Text	Associated Model IDs from Model Coverage feature class, if any. Comma-separated if multiple.	

Project Service Area [FMP]

These fields have been added to the FMP feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Planning Study or Document Name	N	SOURCE	Text	Can be used to connect project to originating document such as such as a city or county master plan	
Model ID	N	MODEL_ID	Text	Associated Model IDs from Model Coverage feature class. Include all models used for this project, including those used to	

				show no negative effect. Comma-separated if multiple.	

Flood Management Strategy [FMS]

These fields have been added to the FMS feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Nonrecurring, Noncapital Cost	Y	NRNC_COST	Float	Estimated nonrecurring, noncapital cost in dollars	
Model ID	N	MODEL_ID	Text	Associated Model IDs from Model Coverage feature class. Include all models used for this strategy including those used to show no negative effect, if applicable. Comma-separated if multiple.	

In addition, the original FMS_COST field is unchanged, but the description is modified here to clarify that this should be used for the total cost:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Estimated Total Strategy Cost	Y	FMS_COST	Float	Estimated total cost in dollars	

In a related change, in Table 14 of the report (refer to page 66 of Exhibit C) and in the FMS Excel worksheet associated with Exhibit C, please insert a field for nonrecurring, noncapital cost to the left of the existing cost field (current column Q) and update the existing field to be total cost.

Nonrecurring, Noncapital Cost ($)	Estimated Total Strategy Cost ($)

Archive (Changes Prior to July 2, 2021)

Changes below were included in the 7/2/21 Template update					
7/2/21	3.3.3	24	ExFldInfraPt	INFRA_TYPE	Added “Dam” to valid entries
6/24/21	3.3.3	24	ExFldInfraPt	INFRA_TYPE	Added “LWC” to valid entries
5/10/21	3.1	18	Entities	CID	Field added
5/10/21			Most feature classes	HUC10	Field added
5/10/21	3.5.2.2, 3.10	32, 51	ExFldExpLn, FME	POP_NIGHT, POP_DAY	Fields added
5/10/21	3.3	19	Infrastructure classes	COND_DESCR	Field added
5/10/21	3.10, 3.11	51, 54	FME, FMP	various	Fields renamed for consistency
5/10/21	3.11	54	FMP	PREPROJLOS, POSPROJLOS, SVI	Fields added
5/10/21	3.11.2	59	FMP_HazPost	REGULATORY	Renamed from REG
5/10/21	3.12	61	FMS	various	Fields renamed for consistency
5/10/21	3.12	61	FMS	REMSTRC500, REMLWC100, REMRDLEN100, WSUP_DESCR, FMS_COST, COSTSTRUCT, REDSTRUCT100, POP_NIGHT100, POP_DAY100, WATER_SUP	Fields added
5/10/21	3.4	26	ExFldProjs	FUND_SRC, BENEFIT	Fields added
5/10/21	3.9	48	Streams	NHD_CODE, CNMS_CODE	Replace REACH_CODE
5/10/21	3.2	18	Watersheds	WS_DESC	Field added
5/10/21			All		Feature class names shortened

Exhibit D Accommodations

October 2022

The purpose of this document is to inform the Flood Planning Regions of recent Exhibit D changes regarding additions to valid entry lists and clarification of some field guidance.

These accommodations and clarifications are a result of Draft Plan review.

Resources for viewing past Exhibit D changes will also be listed.

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Recent Exhibit D Changes

Guidance Regarding Use of Placeholder Values

Many regions find it useful to use placeholder values to indicate that a field is intentionally left blank. Please see the following table for several field situations and the new guidance regarding placeholder use in each situation.

Situation	Guidance
Numeric Fields	Numeric fields should NOT have a placeholder value or “999999”. They should be NULL if the field is not applicable or the data is unknown.
Text fields with valid entry lists	Only values on the Valid Entry list should be used. See the Additional Valid Entry section in this document for values that have been added during Draft review.
Fields that refer to IDs of other feature classes	Fields which list IDs from other feature classes may be "999999" if it is desired to indicate intentionally left blank. An example field is WS_ID in Ex_Map_Gaps.
Text fields without valid entry lists	Text fields **without** valid entry lists may be filled with NULL (preferred) or "999999" consistently if needed to indicate intentionally left blank unless "999999" has other specified use.

Field Guidance Clarification

FC/Table	Field	Guidance	Valid Entries	Description of Change
ExFldExpAll, FutFldExpAll	CRIT_TYPE	Type of critical facility. "Fire" may include fire stations with EMS. "Infrastructure" is public infrastructure such as water/ WW treatment plants. If field CRITICAL is "No" then CRIT_TYPE should be Null.	Medical, Police, Fire, EMS, Shelter, School, Infrastructure, Water Treatment, Wastewater Treatment, Power Generation, Other	Clarification: If field CRITICAL is "No" then CRIT_TYPE should be Null.

Additional Valid Entries

Feature Class/Table	Field	Guidance	Valid Entries	Description of Change
FMP	NEG_IMPACT	Will this project/strategy have negative impact on neighboring areas? "Unknown" value is allowed when field RECOMMEND is "No"	Yes, No, Unknown	Addition of "Unknown", which is only an option for a project that has not been recommended and the field RECOMMEND is "No"
ExFpMp	MIN_CODE	Has the entity adopted minimum regulations pursuant to Texas Water Code Section 16.3145?	Yes, No, Unknown	Added Unknown
ExFpMp	HIGHER	Are higher standards adopted?	Yes, No, Unknown	Added Unknown
ExFpMp	LEV_ENFRC	Level of enforcement of practices	High, Moderate, Low, None, Unknown	Added Unknown
ExFpMp	LEV_FPMP	Floodplain Management Practices	Strong, Moderate, Low, None, Unknown	Added Unknown
ExFpMp	DRAIN_FEE	Does the entity already have stormwater or drainage fee	Yes, No, Unknown	Added Unknown

Previous Exhibit D Updates

The Exhibit D Update Summary document is now current through mid-April 2022. It will be updated with the changes in this document.

An online table showing the geodatabase structure is available here. It will be updated with the changes in this document.

Additionally, a spreadsheet with the Exhibit D geodatabase structure was sent with the GDB Check script on July 18, 2022. It is current except for the changes listed in this document.

Please send any questions or feedback to cynthia.roush@twdb.texas.gov and floodplanngdata@twdb.texas.gov.

From: FloodPlanning
To: FloodPlanning
Cc: Reem Zoun; Cynthia Roush; James Bronikowski; Megan Ingram; Richard Bagans; Anita Machiavello; Tressa Olsen; Ryke Moore; Matt Nelson
Subject: Flood Planning Data Update – FMX Questions and Fields
Date: Friday, June 3, 2022 11:47:00 AM

Dear Regional Flood Planning Group Technical Consultants:

In this Flood Data Update, we are covering:

1. FME Additional Fields

a. Please add the field FMP_COST ("Total Anticipated Project Cost") as an optional field to the FME feature class, after the 'FME_COST' field. This provides a place to preserve estimated cost data that may have been gathered.

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Total Anticipated Project Cost	N	FMP_COST	Float	Anticipated total project cost in dollars including construction cost. Should not include FME_COST.	

b. Please add the following optional fields to FME for associated FMP, FME, and FMSs (FMXs). It was anticipated that if a flood risk study area needed an FME, it would not have an associated FMP or FMS identified yet. However, with progress of the current planning cycle, it appears possible that there will be cases where an FME could have these associated FMSs or FMPs.

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Associated FMEs, FMSs, FMPs	N	ASSOCIATED	Text	Are there associated FMEs, FMSs, or FMPs? Must account for any interdependencies	Yes, No
	N	ASSCFME_ID	Text	FME IDs of strategies compared, comma-separated if multiple	
	N	ASSCFMS_ID	Text	FMS IDs of strategies compared, comma-separated if multiple	
	N	ASSCFMP_ID	Text	FMP IDs of strategies and projects compared, comma-separated if multiple	
	N	ASSC_DESC	Text	A description of the how associated FME, FMS, and FMPs related to this FMP. Must include any interdependencies.	

2. Model Questions

Q: How should we fill FMP fields when models may not be ready for the draft plan?
A: Please utilize professional judgement and approximate information for the draft plan submittal. Confirmation of 'no

negative effect' is required prior to RFPG recommendation of an FMP. The RFPG recommended FMPs are also required to be permittable, constructible and implementable. Please state assumptions made to generate approximate information.

Q: When model extents exceed project boundaries, should all model results be included in the project?
A: While it is appropriate for the entire model extent to be included in the ModelCoverage feature class, the model results, such as area or structures removed from the floodplain, should be limited to the extent of the project.

3. Field Questions

SOURCE Field – Multiple Feature Classes

Q: Are the data source fields intended to be the source of mapping/modeling data?
A: The mapping/modeling SOURCE field is intended to be a study (FIS or citywide master plan). This is true for the Hazard feature classes (ExFldHazard, FutFldHazard, FMP_HazPost) as well as FME. The SOURCE field in FMP and ExFldProjs feature classes should reference "The originating planning study or document" which "can be used to connect the project to originating document such as a city or county master plan". Please reference the Summary of Updates to Exhibit D for further information on the SOURCE field.
Q: Can you clarify if the Source is intended to be an agency or municipality (like FEMA or HCFCD) or a study (like an FIS or citywide master plan)?
A: The mapping/modeling SOURCE is intended to be a study (FIS or citywide master plan).

REGULATORY Field - Multiple Feature Classes

Q: How should we populate the Regulatory field if there are multiple sources of data for a study area and some are regulatory and some are not?
A: Please add the entry "Partial" to the valid entry list for the REGULATORY field in the FME and FMP_HazPost feature classes, making the complete list "Yes, No, Partial". If a region is unable to identify partial at this stage, it is acceptable to list them as "Yes". If a region chooses to use "Yes" for "Partial", please identify in the flood plan that if any portion of the study or project area has regulatory data, the REGULATORY field was filled with "Yes". Please be consistent for the entire region.

Model Date Fields – FME Feature Class

Q: There is inconsistency between the two model dates required in the FME feature class and the one model year required in the Excel table.
A: The FME feature class has fields for dates of hydrologic model and hydraulic model. The later (more recent) of the two dates needs to be used to determine a year for "Existing or Anticipated Models (year)" in the table.

Nature-Based Solution Fields – FMS and FMP Feature Classes

Q: There is inconsistency between Nature-based Solution in the feature class (%) and Excel table (Y/N).
A: In general, the tables require fewer details than the feature classes. The regions can use percent instead of Y/N in the Excel table to match the GIS if they choose. This flexibility was provided since it was anticipated that the RFPGs may not have this level of detail for fields such as % nature-based solution for FMSs.

Negative Impact Mitigation Fields – FMS and FMP Feature Classes

Q: There is inconsistency between negative impact mitigation in the feature class (text) and the table (Y/N).
A: The tables require fewer details than the feature classes. Regions may choose to add fields to the feature classes and columns to the tables beyond what is specified by TWDB.

COSTSTRUCT Field – FMS and FMP Feature Classes

Q: How should the cost per structure removed be handled when no structures are removed from the floodplain (as in the case of a low water crossing)?
A: Cost per structure will not be required if the number of structures removed is 0. Please leave the COSTSTRUCT field blank in this case.

4. Population Questions

Q: Should additional sources be used to assign population to buildings?
A: Yes. The building dataset from the Flood Data Hub provides an estimate based on 2019 Landscan data. However, this is

a starting point, and it is appropriate for regions to utilize other sources to improve the population estimates.

Q: Should day vs. night population be selected on a building basis or project basis?
A: The goal is to choose day or night for the total project, reflecting whether the flood impact would be greatest during the day or night. Day or night should not be selected on a building-by-building basis because this could result in a population greater than is present at any one time.

5. Unique ID Issues

Q: Is it acceptable to have gaps in Unique ID sequencing? One scenario: Projects are removed between the Tech Memo and the Draft Plan.
A: Yes, it is fine to have gaps in the Unique ID sequencing. The most important consideration is the ID format. Please ensure that it matches the latest Unique ID guidance. We will rely on these Unique IDs when combining region information into the state flood plan. In addition, please be sure that IDs are numeric rather than alphanumeric.

Sincerely,
Cynthia

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