2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Boerne Stage Road at Balcones Creek

FMP ID:

Project Sponsor: Kendall County (borders with Bexar County)

Project Source: Kendall County (borders with Bexar County)

Cost Information

Category	Cost*
Design	$833,545
Real Estate	$493,470
Environmental	$10,000
Construction	$4,517,301
Total Cost**	**$5,855,000**

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
10-year storm	$ 376,840	$ -
Total Benefits	**$ 467,622**	
BCA	**0.1**	

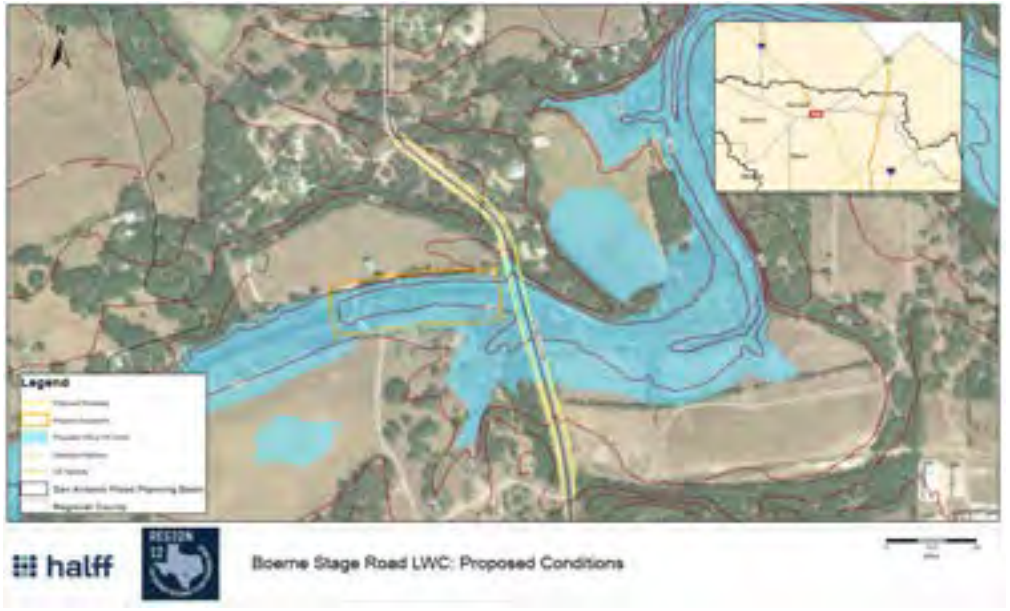
* Costs use September 2020 pricing
**Rounded up to the nearest thousand

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	50-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Roads (miles)	0.083	-	-
Critical	-	-	-
Others Note	N/A	N/A	N/A
SVI Score			-

LWC Level of Service Existing Vs. Proposed

Condition	Level of Service	10-Yr Depth Over Road (ft)
Existing	< 10-Yr	6.7
Proposed	10-Yr	0



Project Description:

At the Boerne Stage Road crossing with Balcones Creek, the road is overtopped by the 10-year flood event at a maximum depth of 6.5 ft. The length of roadway flooded is approximately 0.13 miles. The proposed project is a bridge that will raise the roadway over the low water crossing at the intersection of Balcones Creek and Boerne Stage Road. The proposed bridge will convey the 10-year flood event and lower the depth of water overtopping the roadway for larger flood events. Due to right of way and topography constraints, the 100-year design was not considered for this proposed improvement. The proposed roadway and bridge alignment will straighten the sharp curves that currently exist in Boerne Stage Road within the proximity of the Balcones Creek crossing. The proposed bridge will be approximately 280' in length with an elevated roadway approach of 250' that ties into the existing road. In addition, the project will remove 2 inline structures directly upstream of the proposed structure, which will require property access or acquisition. A flood beacon will be installed for safety at higher flood events. For this study, the most conservative estimate assumes acquisition for a public right of way easement. This project is located at the Kendall County/Bexar County line.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Boerne Stage Road at Balcones Creek - Low Water Crossing**
FMP ID: **----------**
Project Sponsor: **Kendall County (borders with Bexar County)**
Date: **3/3/2023**

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. Boerne Stage Road at Balcones Creek, FMP ID not yet created, from Kendall County was expanded on during Task 12. The sponsor for this project is Kendall County, however the project is located at the county line with Bexar County.

The problem area is located along Boerne Stage Road at a low water crossing with Balcones Creek. Currently there is flooding over the roadway crossing and in the surrounding areas. The 10-year storm is currently overtopping the roadway.

The work completed for the Boerne Stage Road at Balcones Creek project was an update to the cost estimate, roadway realignment, hydraulic analysis, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

At the Boerne Stage Road crossing with Balcones Creek, the road is overtopped by the 10-year flood event at a maximum depth of 6.5 ft. The length of roadway flooded is approximately 0.13 miles. The proposed project is a bridge that will raise the roadway over the low water crossing at the intersection of Balcones Creek and Boerne Stage Road. The proposed bridge will convey the 10-year flood event and lower the depth of water overtopping the roadway for larger flood events. Due to right of way and topography constraints, the 100-year design was not considered for this proposed improvement. The proposed roadway and bridge alignment will straighten the sharp curves that currently exist in Boerne Stage Road within the proximity of the Balcones Creek crossing. The proposed bridge will be approximately 280' in length with an elevated roadway approach of 250' that ties into the existing road. In addition, the project will remove 2 inline structures directly upstream of the proposed structure, which will require property access or acquisition. A flood beacon will be installed for safety at higher flood events. For this study, the most conservative estimate assumes acquisition for a public right of way easement. This project is located at the Kendall County/Bexar County line.

PROPOSED PROJECT SCOPING COST

Refer to the Regional Flood Plan Cost Estimate for documented assumptions and methodologies on project costs.

The estimated project costs for the Boerne Stage Road at Balcones Creek LWC improvements are $5,855,000, calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will eliminate overtopping at Boerne Stage Road for the 10-year storm event by raising the roadway to provide conveyance. The bridge pier design will provide minimal obstruction to the water flow and remove the roadway out of the floodplain. The bridge is designed to have no adverse impact; therefore, the structure will not change the floodplain extents.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Boerne Stage Road at Balcones Creek - Low Water Crossing**
FME ID: **----------**
Project Sponsor: **Kendall County**
Date: **3/3/2023**

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis.

The benefits that were evaluated for this project are, residential buildings, commercial buildings, and recreational. The resulting benefit cost ratio was 0.1. Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit

Project Useful Life	30

Event Damages	Baseline	Project
10 – year storm	$376,840	$-

,Total Benefits from BCA Toolkit	$467,622
Other Benefits (Not Recreation)	$46,220
Recreation Benefits	-
Total Costs	$4,976,361
Net Benefits	-$4,462,519
Net Benefits with Recreation	-$4,462,519
Final BCR	0.1
Final BCR with Recreation	0.1

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on the impact analysis.

Existing and proposed conditions were analyzed for impact, the impacts that were evaluated are the water surface elevations (WSE) and velocities +/-2000ft of this project area. The WSE and velocities were compared in the HEC-RAS v6.2.0 model. The proposed conditions showed reduced levels with both components. From

the RAS results, the total inundated boundary was reduced in proposed conditions, see Exhibits 1- 3 for existing and proposed conditions, WSEL comparison, and a proposed alignment. Flooded depths over the road were evaluated in the BCA and the reduced impacts show lower flooded depths in proposed conditions. The following table summarizes the level of service pre and post project:

Table 2: Level of Service Existing vs. Proposed

Condition	Level of Service	10-Yr Depth Over Road (ft)
Existing	< 10-Yr	6.7
Proposed	10-Yr	0

(See full list of roadway crossing impacts in the attached BCA results as well as Table 2: Level of Service: Existing vs. Proposed)

PROJECT RISKS

ROW/Real Estate Acquisition:

Yes, land acquisition is required.

Utilities Coordination:

No.

Permitting/Environmental:

Yes, a USACE nationwide permit will be required. In addition, this area is part of the Glen Rose Limestone Formation, more specifically the Middle Trinity Aquifer. This aquifer is highly cavernous and includes many sink holes, and other karst features. According to the Texas Water Development Board, the Trinity Aquifer is one of the most extensive and highly used groundwater resources in Texas. Although its water is primarily used by municipalities, it also is used for irrigation, livestock, and other domestic purposes. Any proposed project in this area should note that groundwater and surface water supplies cannot be threatened by any proposed County mobility enhancements and must be protected.

Stakeholder coordination:

Due to the land acquisition, road improvement, and drainage considerations, there will be one stakeholder involved that owns the area where all of the construction will tentatively occur.

MITIGATION OF RISKS

Utility Coordination:

n/a

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Boerne Stage Road at Balcones Creek - Low Water Crossing**
FME ID: **----------**
Project Sponsor: **Kendall County**
Date: **3/3/2023**

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with USACE and property owner acquisitions to avoid schedule delays.

Boerne Stage Road is a low-traffic area. Road reconstruction will cause traffic disruptions and inconveniences for a few private entities. Public meetings and flyers will help communicate construction impacts to affected businesses of any service interruption or inconvenience. Any businesses near the project limits should be notified several weeks before the construction start date. Construction phasing and traffic control will be an important design component for this project.

NATURE BASED SOLUTION CONSIDERATION

The proposed project employs a bridge instead of a low water crossing. Using a bridge benefits the natural ecosystem by allowing more sediment transport, passage of aquatic organisms and does not impound water. The larger opening also allows for natural substrate to cover the stream bottom to allow for aquatic organism passage.

Landscaping cost (10% of total construction cost) was factored into the total cost for potential channel stabilization and NBS solutions.

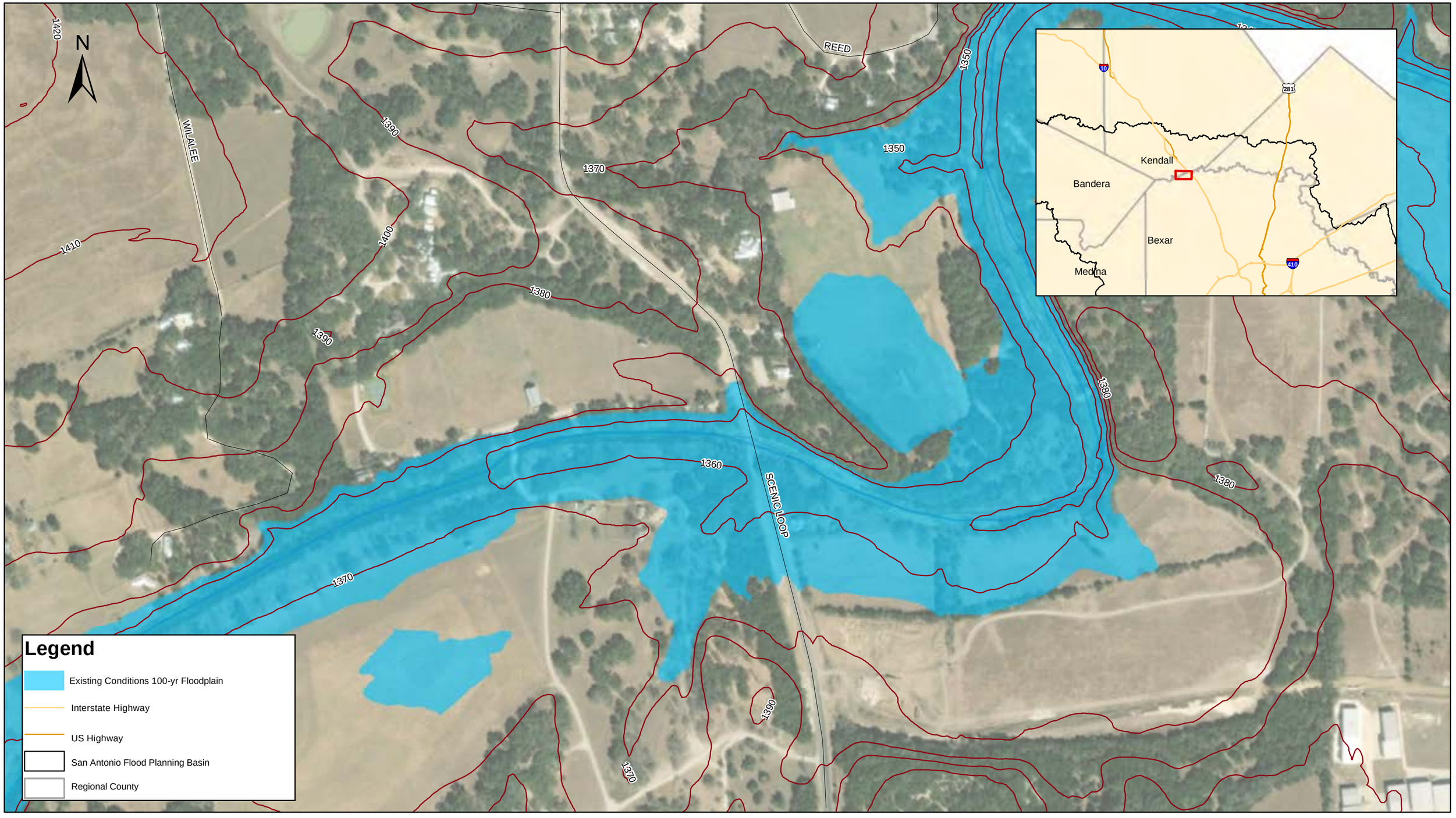
INTERRELATED PROJECTS

This project does not require any interrelated projects to be completed before this project can be constructed.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Project Name:	**Boerne Stage Road at Balcones Creek**
Project Sponsor:	**Kendall County**
Firm Developing:	**HALFF**
Date Developed:	**2/10/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- DRAINAGE COST	**$2,623,129.14**
- TREE PRESERVATION (2%)	**$59,745.87**
- LANDSCAPING (10%)	**$298,729.34**
- BOND AND INSURANCE (3%)	**$100,373.06**
- BARICADES (3%)	**$103,384.25**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$501,865.28**
TOTAL CONSTRUCTION COST ESTIMATE	**$4,051,391.15**
ENGINEER FEE (Fee Table plus 5%)	**$648,222.58**
ENGINEER CONTINGENCY (10%)	**$64,822.26**
CONSTRUCTION CONTINGENCY (10%)	**$405,139.12**
PERMIT REQUIREMENT COSTS	**$70,500.00**
RIGHT-OF-WAY (LAND ACQUISITION)	**$490,970.00**
RIGHT-OF-WAY SURVEY	**$2,500.00**
ENVIRONMENTAL	**$10,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$60,770.87**
TOTAL PROJECT COST ESTIMATE	**$5,854,315.98**
DESIGN PHASE	$1,337,014.84
CONSTRUCTION PHASE	$4,517,301.14



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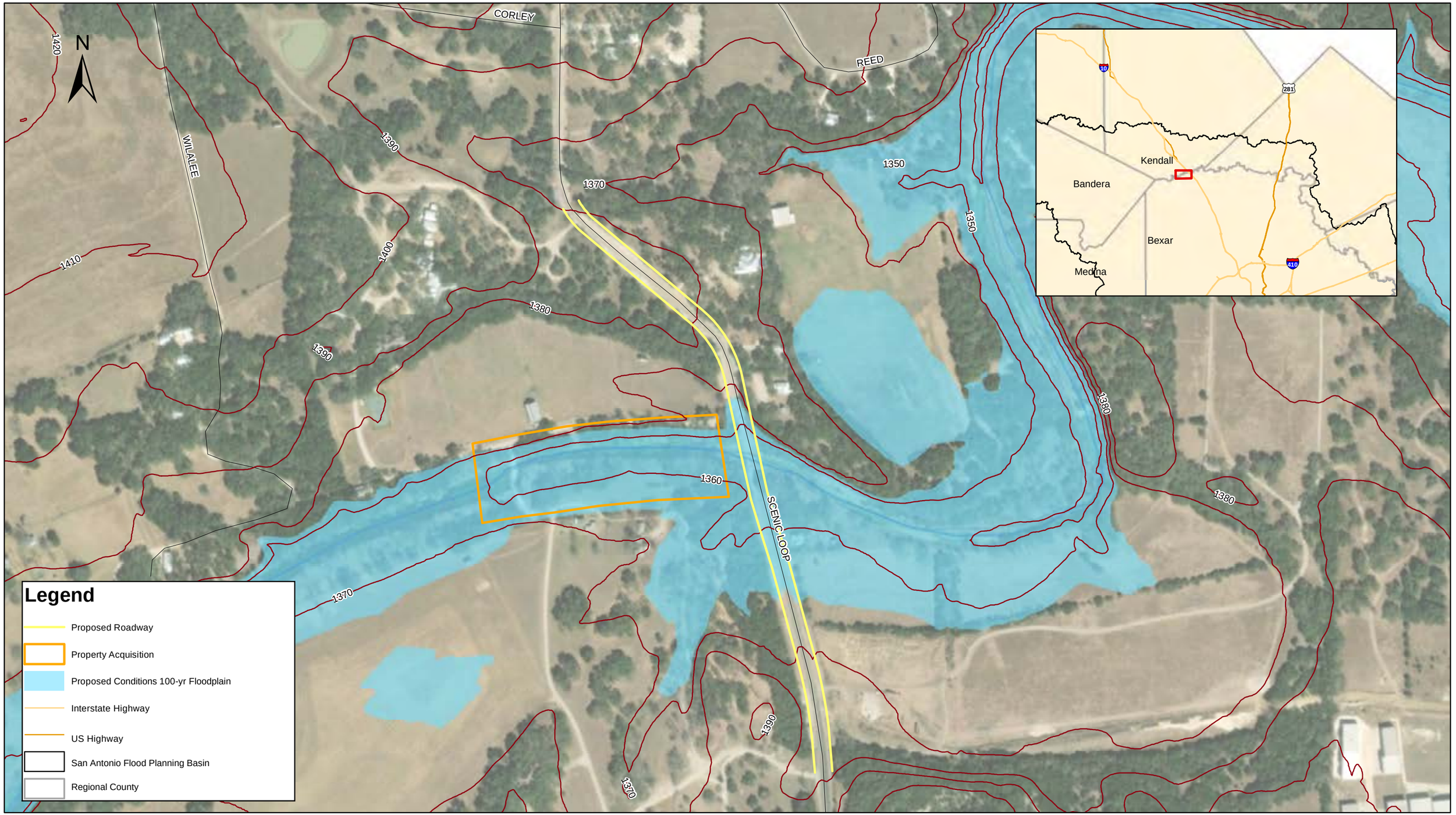
REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 1 - Boerne Stage Road LWC: Existing Conditions

0 12.5 25
Miles



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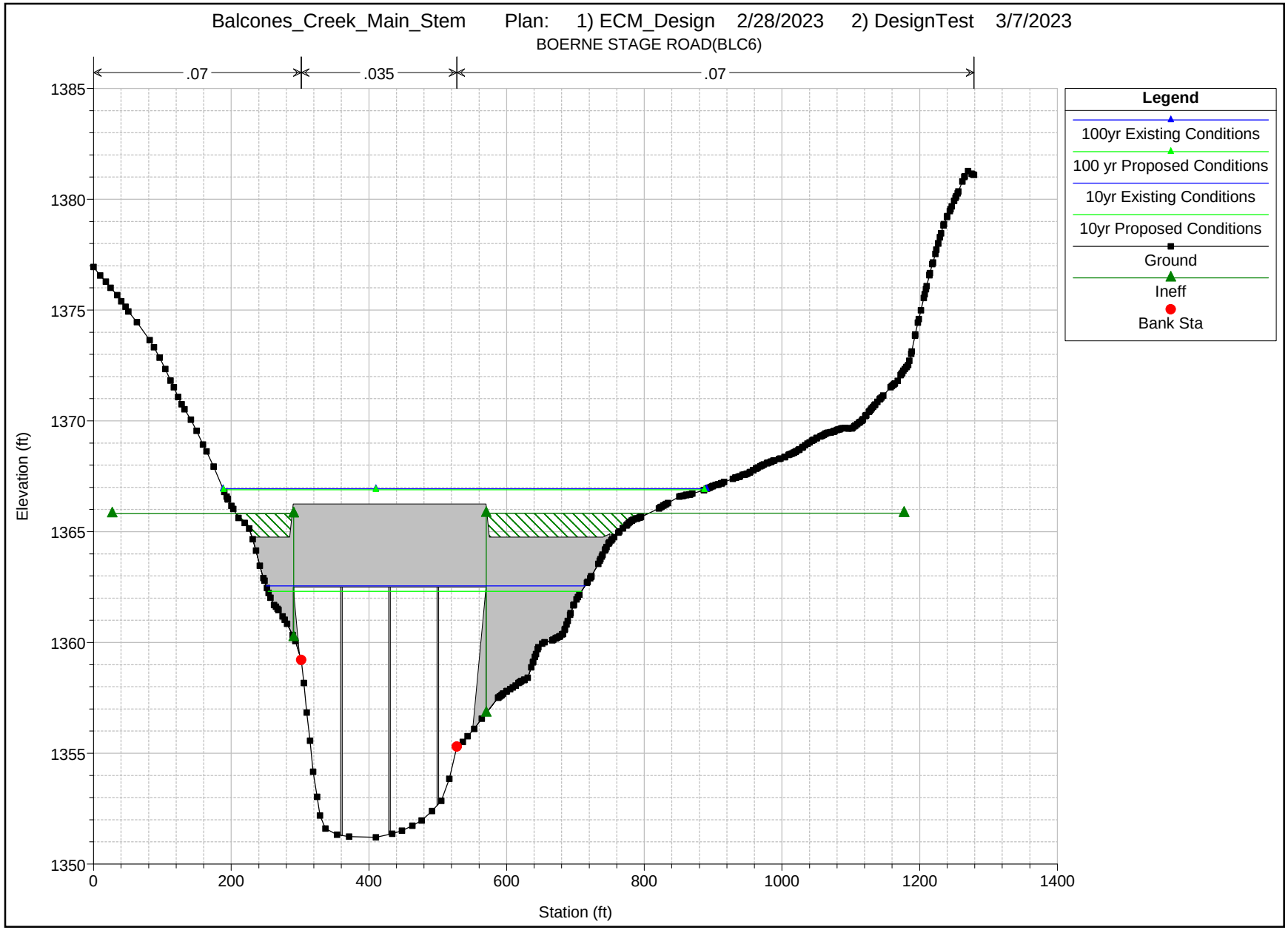
REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 2 - Boerne Stage Road LWC: Proposed Conditions

0 12.5 25
Miles


Balcones_Creek_Main_Stem Plan: 1) ECM_Design 2/28/2023 2) DesignTest 3/7/2023
BOERNE STAGE ROAD(BLC6)
.07
.035
.07
Legend
100yr Existing Conditions
100 yr Proposed Conditions
10yr Existing Conditions
10yr Proposed Conditions
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1385
1380
1375
1370
1365
1360
1355
1350
0
200
400
600
800
1000
1200
1400

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Damage Center 38 - Olmos Creek Near Montview

FMP ID: ----------

Project Sponsor: City of San Antonio

Project Source: Upper San Antonio River Master Plan

Cost Information

Category	Cost*
Design	$250,000
Real Estate	$0
Environmental	$0
Construction	$2,906,650
Total Cost**	**$3,157,000**

*Costs set to September 2020
**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
100-year storm	$ 3,485,000	$ -
Total Benefits	**$ 3,485,000**	
BCA	**1.1**	

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	50-year	100-year
Residential	-	-	17
Commercial	-	-	-
Flooded Roads (miles)	-	-	-
Critical	-	-	-
Others Note	-	-	-
SVI Score			-

Project Description:

A total of 17 lots are impacted by the 100-year flood. 10 of the 17 lots have a flood depth less than one foot, four lots have a flood depth less than two feet, two lots have a flood depth of less than three feet, and the remaining lot has a flood depth less than four feet. The original scope of the project included 10 affected lots with flooding depths ranging from 0.1 – 0.15 feet. The existing conditions modeled has since been updated since the Upper San Antonio River Master Plan, resulting in a rise in water surface elevations and affecting more structures. The recommended improvement in the Upper San Antonio River Master Plan for Damage Center 38 included flood proofing and elevating the affected structures. This proposed project evaluated elevating the inundated structures.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 38: Olmos Creek Near Montview**
FMP ID: **----------**
Project Sponsor: **City of San Antonio**
Date: **2/9/2023**

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan, Task 12 expands on previously identified FMXs from the Plan dated January 10th, 2023. The Damage Center 38: Olmos Creek Near Montview, FME ID 121000081, from the Upper San Antonio River Master Plan (USRMP) was further developed during Task 12. The sponsor for this project is the City of San Antonio.

This damage center is between Jackson Keller Road and West Avenue just downstream of the confluence of Rock Creek and Olmos Creek. The area consists of primarily single-family residential properties. Robert E. Lee High School is just north of Loop 410 in the Castle Hills area. The flooding source for this damage center is Olmos Creek. Flooding occurs on the left overbank and begins just upstream of Montview. The Task 12 work that was completed for the Damage Center 38 project was an update to the cost estimate, impact analysis, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

A total of 17 lots are impacted by the 100-year flood. 10 of the 17 lots have a flood depth less than one foot, four lots have a flood depth less than two feet, two lots have a flood depth of less than three feet, and the remaining lot has a flood depth less than four feet. The original scope of the project included 10 affected lots with flooding depths ranging from 0.10 – 0.15 feet. The existing conditions model has been updated since the USRMP, resulting in a rise in water surface elevations and affecting more structures. The recommended improvement in the USRMP for Damage Center 38 included flood proofing and elevating the affected structures. Elevating the inundated structures was the chosen improvement, as it provides a greater benefit by raising the structure above the base flood elevation.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on project costs.

The estimated the project construction cost was $407,554 in the USRMP. A new cost estimate was performed to account for the additional flood depth and homes in the floodplain. The costs for elevating structures ranged from $43-$45 per square foot depending on the height the structures were elevated. The costs for elevating were taken from Appendix E of the USACE Analysis of Nonstructural Committee Assessment. These costs were combined with additional project costs (Design, Permitting, Project Management, etc.) resulting in a project cost of $2,238,000. At this time, funding for the project has not been identified or approved. The cost could be reduced if all 17 structures are not elevated. Structures that have a flood depth of less than three feet could be floodproofed which would significantly reduce the overall construction cost; however, floodproofing may be less effective at mitigating flood insurance requirements compared to elevating.

PROPOSED PROJECT BENEFITS

Elevating the structures would eliminate them from the effective FEMA floodplain for the 100-year storm. If structures are to be floodproofed instead of elevated, they will not be removed from the floodplain and flood insurance would still be required per the NFIP regulations.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 38: Olmos Creek Near Montview**
FMP ID: **----------**
Project Sponsor: **City of San Antonio**
Date: **2/9/2023**

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis. In addition, assumptions were used from FEMA's ***Update to "Cost-Effectiveness Determinations for Acquisitions and Elevations in Special Flood Hazard Areas Using Pre-Calculated Benefits" Memorandum***

The 100-year benefits that were evaluated for this project include residential buildings. The resulting benefit cost analysis was 1.1. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Table 1: TWDB CA Toolkit

Input Into BCA Toolkit

Project Useful Life	**30**

Event Damages	**Baseline**	**Project**
100 - year storm	**$0**	**$0**

Total Benefits from BCA Toolkit	$3,485,000
Other Benefits (Not Recreation)	$0
Recreation Benefits	-
Total Costs	$3,053,734
Net Benefits	$431,266
Net Benefits with Recreation	$431,266
Final BCR	**1.1**
Final BCR with Recreation	**1.1**

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

A total of 17 structures were found to be impacted in this project area. The proposed improvements while providing benefit to the structures do not have an impact on the floodplain. See Exhibit 1 for elevated structures.

The following table summarizes the total amount of impacted structures in each storm (proposed count is assuming all structures are elevated).

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 38: Olmos Creek Near Montview**
FMP ID: **----------**
Project Sponsor: **City of San Antonio**
Date: **2/9/2023**

Table 2: Total Impacted Structures per Storm Frequency

Storm (Year)	Existing	Proposed	Difference
100	17	0	-17

PROJECT RISKS

ROW/Real Estate Acquisition:

No, land acquisition is not required.

Utilities Coordination:

Yes, there is possible utility conflict when elevating the structures.

Permitting/Environmental:

No

Stakeholder coordination:

Standard stakeholder coordination.

MITIGATION OF RISKS

Utility Coordination:

Coordination should occur early with utilities to determine level of effort to accommodate elevating structures.

Stakeholder Coordination:

Coordination and permitting process should be started early on with property owners to avoid schedule delays. Accommodations will have to be considered for property owners when the buildings might be inaccessible.

NATURE BASED SOLUTION CONSIDERATION

Nature based solutions were not considered for this project.

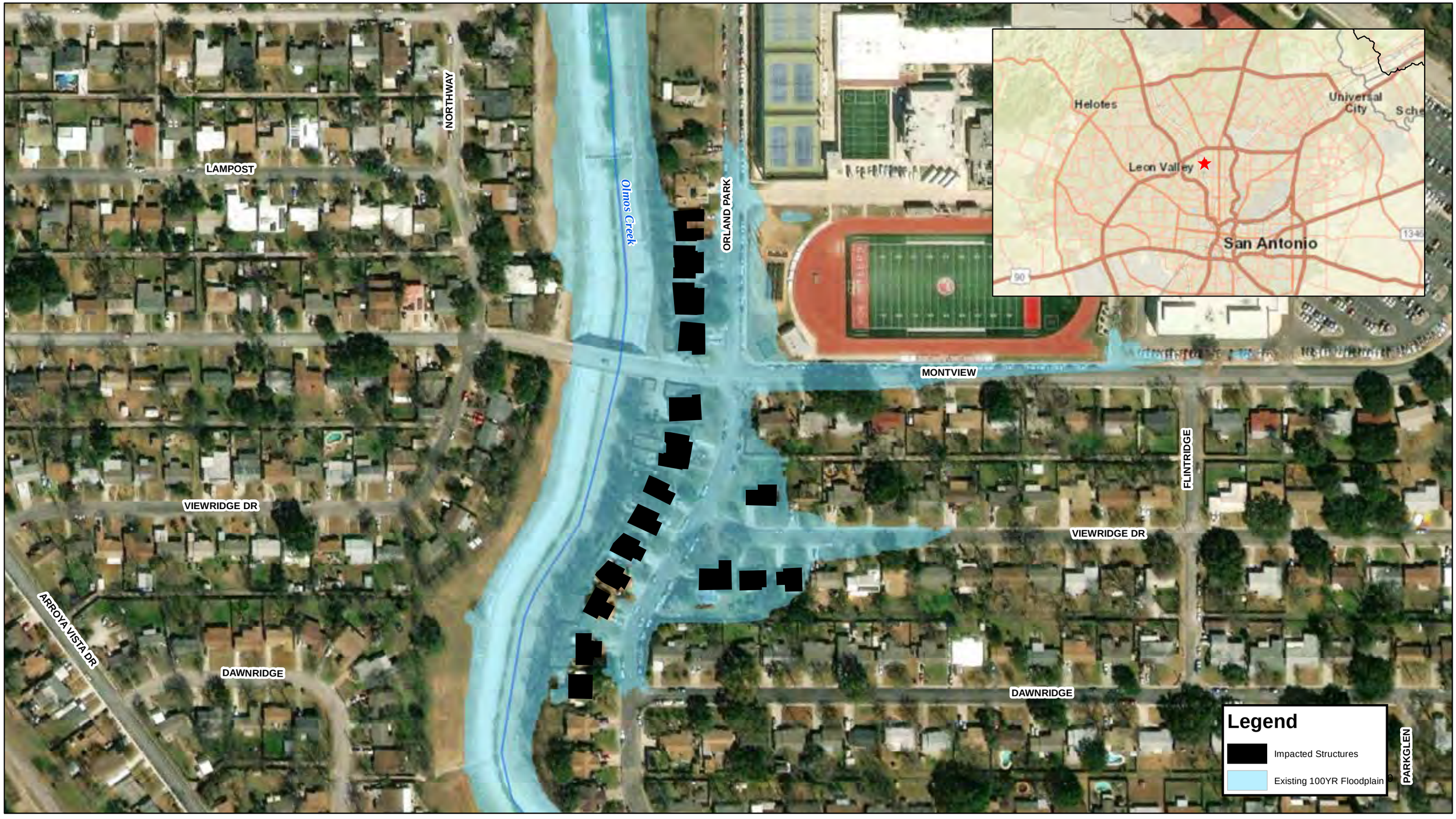
INTERRELATED PROJECTS

There are no interrelated projects with this project.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Project Name:	**Damage Center 1: Project 1A, B, C**
Project Sponsor:	**City of San Antonio**
Firm Developing:	**Halff**
Date Developed:	**2/10/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- DRAINAGE COST	**$2,906,650.00**
- TREE PRESERVATION (2%)	**$0.00**
- LANDSCAPING (10%)	**$0.00**
- BOND AND INSURANCE (3%)	**$87,199.50**
- BARICADES (3%)	**$0.00**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$0.00**
TOTAL CONSTRUCTION COST ESTIMATE	**$2,993,849.50**
ENGINEER FEE (Fee Table plus 5%)	**$493,985.17**
ENGINEER CONTINGENCY (10%)	**$0.00**
CONSTRUCTION CONTINGENCY (10%)	**$0.00**
PERMIT REQUIREMENT COSTS	**$0.00**
RIGHT-OF-WAY (LAND ACQUISITION)	**$0.00**
RIGHT-OF-WAY SURVEY	**$0.00**
ENVIRONMENTAL	**$0.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$0.00**
TOTAL PROJECT COST ESTIMATE	**$3,487,834.67**
DESIGN PHASE	$250,000.00
CONSTRUCTION PHASE	$2,906,650.00



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REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 1 - Damage Center 38: Olmos Creek near Montview Existing 100 year Floodplain and Impacted Structures

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2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Damage Center 40-San Antonio River DS Reach near Roosevelt

FMP ID:

Project Sponsor: City of San Antonio

Project Source: Upper San Antonio River Master Plan

Cost Information

Category	Cost*
Design	$308,000
Real Estate	$2,681,125
Environmental	$0
Construction	$4,827,870
Total Cost**	**$7,817,000**

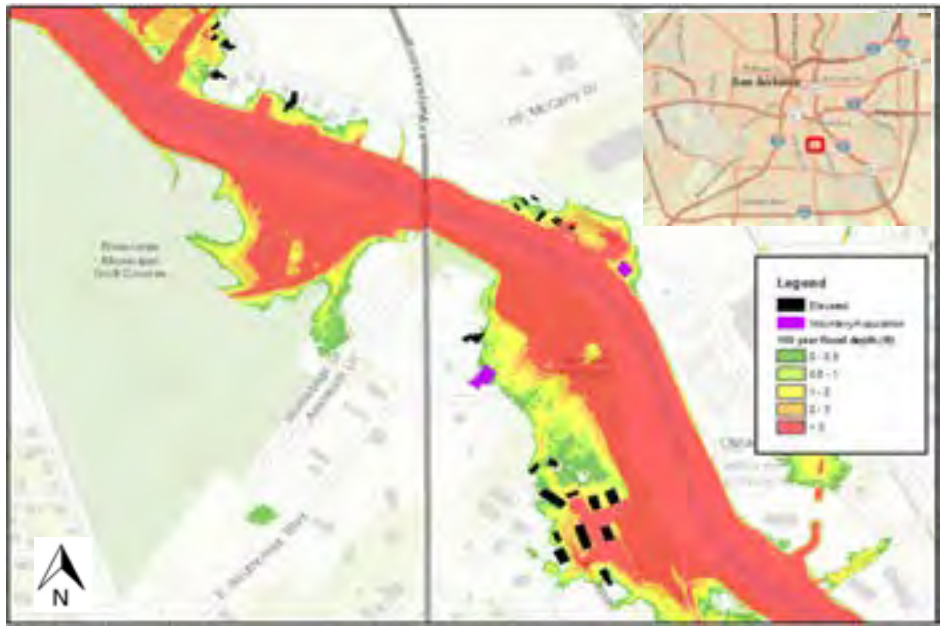
*Costs are using 2020 prices
**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
100-year storm	$ 5,566,000	-
Total Benefits	**$ 5,566,000**	
BCA	**0.9**	

Impact Analysis

Post-Project Total Removed	Storm Event		
	25-year	50-year	100-year
Residential	3	5	5
Commercial	1	6	21
Flooded Roads (miles)	-	-	-
Critical	-	-	-
Others Note	N/A	N/A	N/A
SVI Score			-



Project Description:

Business and residents along the San Antonio River downstream of Mission Road. While some properties were removed from the floodplain after the Mission Reach Ecosystem Restoration project on the river, there are several homes and properties that remain inundated. The original investigation for this project came from the Upper San Antoino River Master Plan. Flooding depths range from 0.05 to 3.41 feet. Damage Center Number 40 considered floodproofing, elevating, and voluntary acquisition. Many assumptions were carried over from the original study. A significant number of the structures within this damage center are multi-family housing and there are two lots owned by the San Antonio Housing Authority. It may not be feasible to elevate these structures; however, there may be the potential to abandon the first floor of the apartment buildings. All residential structures were assumed to be elevated. Commercial businesses were assumed as wet-floodproofed.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 40-San Antonio River DS Reach near Roosevelt**
FMP ID: **----------**
Project Sponsor: **City of San Antonio**
Date: **3/21/2023**

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. Damage Center 40-San Antonio River DS Reach near Roosevelt, FME ID 121000079, from the City of San Antonio was expanded on during Task 12. The sponsor for this project is City of San Antonio.
Businesses and residents along the San Antonio River downstream of Mission Road become inundated during the 100-year flood event. While the Mission Reach Ecosystem Restoration project has mitigated flooding in this area, several homes and properties remain inundated. The original investigation for this project came from the Upper San Antonio River Master Plan.

The work completed for the Damage Center 40-San Antonio River DS Reach project was updates to the flood impacts, cost estimate, and Benefit Cost Analysis (BCA), previously studied by San Antonio River Authority (SARA).

PROPOSED PROJECT SCOPE

Flooding depths for structures in the floodplain range from 0.05 to 3.41 feet. The proposed project considered floodproofing, elevating, and voluntary acquisition. Many assumptions were carried over from the original study. A significant number of the structures within this damage center are multi-family housing, of which two lots are owned by the San Antonio Housing Authority. It may not be feasible to elevate these structures; however, there may be the potential to abandon the first floor of the apartment buildings. All residential structures were assumed to be elevated. The smaller commercial businesses were evaluated as wet-floodproofed. The 2 larger commercial businesses were evaluated as voluntary acquisition.

PROPOSED PROJECT SCOPING COST

Refer to the Regional Flood Plan Cost Estimate for documented assumptions and methodologies on project costs. Floodproofing and elevating costs were based off information from the U.S. Army Corp of Engineers publication *Raising and Moving Slab-on-Grade House with Slab Attached*.

The estimated project cost for the proposed project is $6,748,000, calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will remove residential structures from the floodplain through elevation, as well as protect multi-family and commercial properties through wet floodproofing for the 100-year flood event.

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis. In addition, benefit were determined from FEMA's *Update to "Cost-Effectiveness*

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 40-San Antonio River DS Reach near Roosevelt**
FMP ID: **121xxxxxx**
Project Sponsor: **City of San Antonio**
Date: **3/21/2023**

Determinations for Acquisitions and Elevations in Special Flood Hazard Areas Using Pre-Calculated Benefits" Memorandum.

The benefits that were evaluated for this project are, residential buildings and commercial buildings. The resulting benefit cost analysis was 0.9. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit

Project Useful Life 30

Event Damages	Baseline	Project
100 - year storm	$5,566,000	$0

Total Benefits from BCA Toolkit	$5,566,000
Other Benefits (Not Recreation)	$251,122
Recreation Benefits	-
Total Costs	$6,644,703
Net Benefits	-$827,581
Net Benefits with Recreation	-$827,581
Final BCR	0.9
Final BCR with Recreation	0.9

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

There are no impacts to the floodplain as this project does not alter the existing conditions in the floodplain.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 40-San Antonio River DS Reach near Roosevelt**
FMP ID: **----------**
Project Sponsor: **City of San Antonio**
Date: **3/21/2023**

Table 2: Total Impacted Structures per Storm Frequency

Storm (Year)	Existing	Proposed	Difference
100	26	0	-26

PROJECT RISKS

ROW/Real Estate Acquisition:

No, land acquisition is not required, however, property owner coordination will be required as this project involves elevating or flood proofing buildings.

Utilities Coordination:

Utility coordination could be required for homes to be elevated.

Permitting/Environmental:

Only local permitting will be required for elevating structures.

Stakeholder coordination:

Property owners are the only stakeholders for this project. Elevating or floodproofing would require permission from the property owners.

MITIGATION OF RISKS

Utility Coordination:

Coordination should occur early with utilities to determine level of effort to accommodate elevating structures.

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with property owners to avoid schedule delays. Accommodations will have to be considered for property owners when the buildings might be inaccessible.

NATURE BASED SOLUTION CONSIDERATION

Acquisition of the commercial facilities would provide 2.56 acres of open space that could be utilized as a community gathering space and offers potential for low impact development and green infrastructure, such as bioswales, extended detention, or vegetated swales.

INTERRELATED PROJECTS

This project does not require any interrelated projects to be completed before this project can be constructed.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Project Name:	**Old Frio City Road at North Prong Creek LWC Improvements**
Project Sponsor:	**Bexar County**
Firm Developing:	**Halff**
Date Developed:	**3/3/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- DRAINAGE COST	**$4,470,250.00**
- BOND AND INSURANCE (3%)	**$134,107.50**
- MOBILIZATION & PREPARATION OF R.O.W. (5% + 0%)	**$200,000.00**
TOTAL CONSTRUCTION COST ESTIMATE	**$4,804,357.50**
ENGINEER FEE (Fee Table plus 5%)	**$300,000.00**
PERMIT REQUIREMENT COSTS	**$8,000.00**
RIGHT-OF-WAY (LAND ACQUISITION)	**$2,676,125.00**
RIGHT-OF-WAY SURVEY	**$5,000.00**
TOTAL PROJECT COST ESTIMATE	**$7,793,482.50**
DESIGN PHASE	$2,989,125.00
CONSTRUCTION PHASE	$4,827,870.00

halff

REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 1 - Damage Center 40: San Antonio River DS Reach near Roosevelt
Existing 100 year Floodplain and Impacted Structures

0 5 10
Miles

N

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Elm Spring

FMP ID: ----------

Project Sponsor: City of Shavano Park

Project Source: Shavano Park Preliminary Engineering Report'

Cost Information

Category		Cost*
Design		$340,048.99
Real Estate		$0.00
Environmental		$10,000.00
Construction	$	1,679,059.39
Total Cost**	**$**	**2,030,000.00**

*Costs Adjusted using CCI

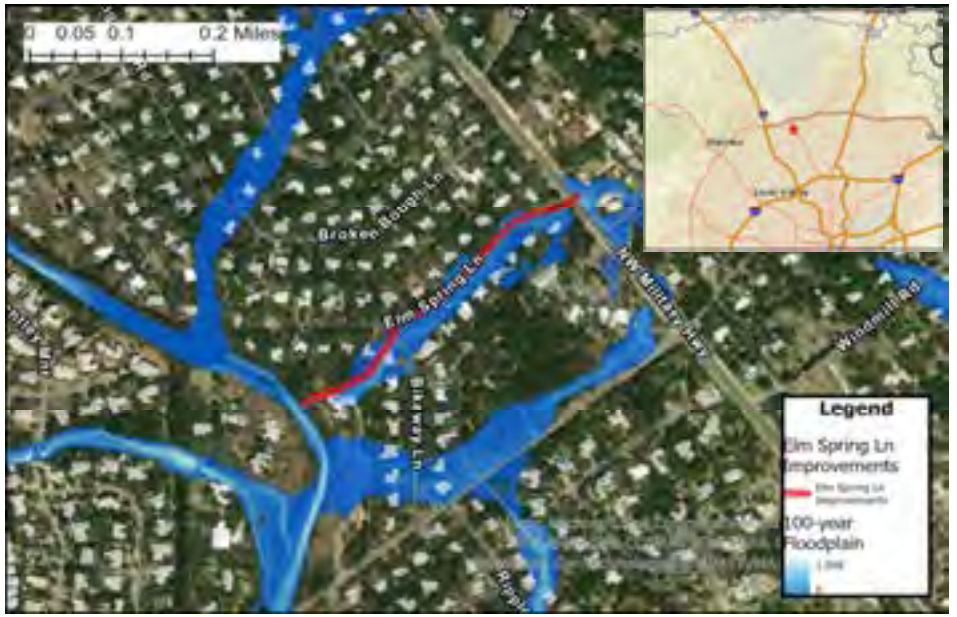
**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

Event Damages		Baseline		Project
25-year storm	$	205,491	$	-
100-year storm	$	663,007	$	-
Total Benefits	**$**	**219,677**		
BCA		**0.1**		

Impact Analysis

Post-Project Total Removed	Storm Event		
	25-year	100-year	
Residential	2.00	4.00	
Commercial	N/A	N/A	
Critical	N/A	N/A	
Road (miles)	0.06	0.09	
Others Note	N/A	N/A	
SVI Score	N/A	N/A	



Project Description:

Currently, almost all of Elm Spring Ln experiences significant flooding in any rainfall event eliminating access to to all but one home along Elm Spring Ln. The flooding occurs at the intersection of Elm Spring and and NW Military Hwy and extends beyond the Bikeway Ln and Elm Spring Ln intersection.

An underground storm drain system has been proposed to alleviate roadway flooding by intercepting water near NW Military with a 4-way inlet, conveying it through the underground system and discharging into an earthen channel that flows downstream into Olmos Creek.

The project is anticipated to remove at least two of the ten homes from the limits of the 25-year floodplain and four from the 100-year floodplain.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Elm Spring**
FMP ID: **----------**
Project Sponsor: **City of Shavano Park**
Date: **3/3/2023**

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. Shavano Park Elm Spring, from the 2020 Preliminary Engineering Report (PER) was expanded on during Task 12. The sponsor for this project is the City of Shavano Park.

Nearly all of Elm Spring Ln experiences significant flooding in any rainfall event eliminating access to all but one home along Elm Spring Ln. Flooding occurs at the intersection of Elm Spring and NW Military Hwy and extends beyond the Bikeway Ln and Elm Spring Ln intersection.

The work that was completed for the Elm Spring project was an update to the cost estimate, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

An underground storm drain system has been proposed to alleviate roadway flooding by intercepting water near NW Military into an underground system and discharging into an earthen channel that flows downstream into Olmos Creek. The project is anticipated to remove at least two of the ten homes from the limits of the 25-year floodplain and four homes from the 100-year floodplain.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on project costs.

The total project cost is estimated to be $1,686,851 from the 2020 City of Shavano Park Preliminary Engineering Report. The cost estimate was updated using the Construction Cost Index (CCI) of 1.008 from April 2020 to September 2020. The total project cost increased to $2,029,108. There are underground utilities that require relocation and driveway acquisition that might impact costs. Currently, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will reduce flood depths on Elm Spring Ln and improve the level of service by providing a 100-year conveyance design. The storm drain system will improve the flooding on the surrounding roads and provide access during a storm event.

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis.

The benefits that were evaluated for this project is flooded streets and removal of 4 homes from the 100-year floodplain. The resulting benefit cost analysis was 0.2. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Elm Spring**
FMP ID: **----------**
Project Sponsor: **City of Shavano Park**
Date: **3/3/2023**

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit		
Project Useful Life	30	
Event Damages	Baseline	Project
25 - year storm	$205,491	$0
100 - year storm	$663,007	$0
Total Benefits from BCA Toolkit	$219,677	
Other Benefits (Not Recreation)	$0	
Recreation Benefits	-	
Total Costs	$1,506,515	
Net Benefits	-$1,159,528	
Net Benefits with Recreation	-$1,159,528	
Final BCR	0.1	
Final BCR with Recreation	0.1	

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis. See Exhibits 1 -3 for existing and proposed conditions.

There are no downstream impacts.

Table 2: Total Impacted Structures per Storm Frequency

Storm (Year)	Existing	Proposed	Difference
25	2	0	-2
100	4	0	-4

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Elm Spring**
FMP ID: **----------**
Project Sponsor: **City of Shavano Park**
Date: **3/3/2023**

PROJECT RISKS

ROW/Real Estate Acquisition:

No, land acquisition is not required.

Utilities Coordination:

Yes, there is possible utility conflict running underground along NW Military Hwy. The proposed storm drain would cause them to relocate.

Permitting/Environmental:

A USACE nationwide permit will be required. NW Military Hwy is a TxDOT roadway and coordination and permitting will be required.

Stakeholder coordination:

Due to the road improvement, and utility relocation, the stakeholder will be involved in the process.

MITIGATION OF RISKS

Utility Coordination:

The utility coordinator will need to closely work with the affected utility companies to ensure timely completion of the proposed project. The project manager and contractor should minimize, as much as feasible, the amount of disruption of services and travel.

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with Shavano Park acquisitions to avoid schedule delays. In addition, coordination should start early with TxDOT concerning impacts to NW Military Hwy.

NW Military Hwy and Elm Springs Lane intersection is a main road into the several residential buildings. Road reconstruction will cause traffic disruptions and inconveniences for businesses due to limited alternative access points. Public meetings and fliers will help communicate construction impacts to affected businesses of any service interruption or inconvenience. The businesses near the project limits should be notified several weeks before the construction start date. Construction phasing and traffic control will be an important design component for this project.

NATURE BASED SOLUTION CONSIDERATION

Nature based solutions could be considered for this project. During design this project could incorporate natural channel design components or low impact development.

INTERRELATED PROJECTS

This project interrelates with other projects mentioned within the PER, but project completion will not depend on other projects.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Version: 7/2/2021

Project Name:	**Elm Spring**
Project Sponsor:	**City of Shavano Park**
Firm Developing:	**KFW**
Person Developing:	
Date Developed:	**2/10/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- STREET COST	
- DRAINAGE COST	**$1,305,785.07**
- TREE PRESERVATION (2%)	**$26,115.70**
- BOND AND INSURANCE (3%)	**$39,957.02**
- BARICADES (3%)	**$41,155.73**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$199,785.12**
TOTAL CONSTRUCTION COST ESTIMATE	**$1,612,798.65**
ENGINEER FEE (Fee Table plus 5%)	**$340,048.99**
ENGINEER CONTINGENCY (10%)	**$34,004.90**
ENVIRONMENTAL	**$10,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$32,255.97**
TOTAL PROJECT COST ESTIMATE	**$2,029,108.52**
DESIGN PHASE	$384,053.89
CONSTRUCTION PHASE	$1,806,334.49

EXHIBIT 1

ELM SPRING EXISTING CONDITIONS

Key To Features

Existing 100 Year Floodplains

- 0 - 0.625999987
- 0.625999987 - 0.958999991
- 0.958999991 - 1.697999954
- Roads

N
W E
S

0 100 200 400

Feet

1 inch = 200 feet

halff

Map Document: (Parcels_Affected) 11/8/2006 -- 2:22:32 PM

EXHIBIT 2

ELM SPRING PROPOSED CONDITIONS

Key To Features

Elms Spring

Proposed 100 Year Floodplains

- 0 - 0.457
- 0.457 - 0.6096
- 0.6096 - 0.762

Roads

N
W E
S

0 100 200 400

Feet

1 inch = 200 feet

halff

Map Document: (Parcels_Affected) 11/8/2006 -- 2:22:32 PM

EXHIBIT 3

ELM SPRING PROPOSED AND EXISTING CONDITIONS

Key To Features

Elms Spring

Proposed 100 Year Floodplain

Existing 100 Year Floodplain

Roads

N
W E
S

0 100 200 400

Feet

1 inch = 200 feet

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Map Document: (Parcels_Affected) 11/8/2006 -- 2:22:32 PM

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Damage Center 2- Project 2 Road connection from Mosspoint to Sunshine

FMP ID: 121000051

Project Sponsor: City of Poth

Project Source: 2012 Wilson County Watershed Master Plan

Cost Information

Category	Cost*
Design	$202,508
Real Estate	$76,050
Environmental	$10,000
Construction	$1,100,245
Total Cost**	**$1,389,000**

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
10-year storm	$ 3,920	$ -
50-year storm	$ 3,924	$ -
100-year storm	$ 3,928	$ -
Total Benifits	**$ 4,864**	
BCA	**0.02**	

* Cost set to September 2020 values
**Rounded up to the nearest thousand

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	50-year	100-year
Residential			
Commercial			
Critical	-	-	-
Road (miles)	0.09	0.11	0.14
Others Note	N/A	N/A	N/A
SVI Score	-	-	

Project Description:

Residents along Moss Point Street in Poth, Texas to no have a safe route of travel for evacuation during a flood event. In addtion, emergency vehicles are unable to access the area, cutting off police, fire and EMS. At Moss Point Drive, the only outlet, Oakland Street, becomes overtopped starting at the 10-year flood event and flood waters cover up to 0.09 miles of Oakland Street at depths of up to 3 feet. This project will provide unflooded access from Moss Point Street to Sunshine Drive. Adding a new roadway from the dead end of Moss Point, north towards FM 541 at Sunshine Dr, will provide safe access in the event of a 100-year flood. Under current conditions, they will remain trapped during the 10-year, 50-year, 100-year flood events. In addition to safe passage for residents, this additional access will allow emergency vehicles to access the are during a flood event. The proposed access road will be approximately 3000 feet in length with a width of 28 feet that will tie to both FM 541 and Sunshine Drive.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 2- Project 2 Road Connection from Moss Point to Sunshine**
FMP ID: **----------**
Project Sponsor: **City of Poth**
Date: **2/6/2023**

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FME ID 121000051 from the Plan dated January 10th, 2023. Damage Center 2- Project 2 Road connection from Moss Point to Sunshine came from the 2012 Wilson County Watershed Master Plan. The sponsor for this project is the City of Poth.

The problem area is located along Moss Point Drive and the surrounding residents in the City of Poth. Current conditions leave these residents with only one route, Oakland Street, to the main roads. Oakland Street runs through floodplains. The 10-year storm is currently overtopping the roadway so significantly that the residents in the area have no means of gaining access to main roads.

The work that was completed for Damage Center 2- Project 2 Road Connection from Moss Point to Sunshine was an update to the cost estimate, impact analysis, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

Residents along Moss Point Street in Poth, Texas to no have a safe route of travel for evacuation during a flood event. At Moss Point Drive, the only outlet, Oakland Street, becomes overtopped starting at the 10-year flood event and flood waters cover up to 0.14 miles of Oakland Street at depths of up to 6.2 feet. This project will provide unflooded access from Moss Point Street to Sunshine Drive. Adding a new roadway from the dead end of Moss Point, north towards FM 541 at Sunshine Dr, will provide safe access in the event of a 100-year flood. Under current conditions, they will remain trapped during the 10-year, 50-year, 100-year flood events. In addition to safe passage for residents, this additional access will allow emergency vehicles to access the area during a flood event. The proposed access road will allow residents safe passage out of their homes in the event of the 10-year flood. The proposed access road will be approximately 3000 feet in length with a width of 28 feet that will tie to both FM 541 and Sunshine Drive.

PROPOSED PROJECT SCOPING COST

Refer to the Regional Flood Plan Cost Estimate for documented assumptions and methodologies on project costs.

The estimated project costs for Mosspoint to Sunshine Road Connection are $1,388,803, this was calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will provide safe access for residents on and around Moss Point Drive to safer, less flooded, zones in the event of the 100-year storm by building the access road on an area not within the floodplain. Additionally, the roadway will minimally impact the floodway since it is built outside of the floodplain.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 2- Project 2 Road Connection from Moss Point to Sunshine**
FMP ID: **----------**
Project Sponsor: **City of Poth**
Date: **2/6/2023**

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis.

The benefits that were evaluated for this project are, residential buildings, commercial buildings, and recreational. The resulting benefit cost analysis was 0.02. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit

Project Useful Life	**30**

Event Damages	Baseline	Project
10 – year storm	**$3,920**	**$0**
50 – year storm	**$3,924**	**$0**
100 - year storm	**$3,928**	**$0**

Total Benefits from BCA Toolkit	$4,864
Other Benefits (Not Recreation)	$23,607
Recreation Benefits	-
Total Costs	$1,031,119
Net Benefits	-$1,002,648
Net Benefits with Recreation	-$1,002,648
Final BCR	**0.0**
Final BCR with Recreation	**0.0**

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

See Exhibits 1 and 2 for existing and proposed, and an US view of the comparison of WSE. Flooded depths over the road were evaluated in the BCA, reduced impacts show lower flooded depths in proposed conditions. The following table summarizes the level of service pre and post project:

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 2- Project 2 Road Connection from Moss Point to Sunshine**
FMP ID: **----------**
Project Sponsor: **City of Poth**
Date: **2/6/2023**

Table 2: Level of Service Existing Vs. Proposed

Condition	Level of Service	100-Yr Depth Over Road (ft)
Existing	< 10-Yr	3.7
Proposed	100-Yr	0

PROJECT RISKS

ROW/Real Estate Acquisition:

Yes, land acquisition is required.

Utilities Coordination:

No, there are no known utility considerations for the purpose of this project. The access way will be built on unutilized land.

Permitting/Environmental:

No, a USACE nationwide permit will not be required.

Stakeholder coordination:

Due to the land acquisition and road, there will be various stakeholders involved in the process. The access road runs through three parcels of private owned land.

MITIGATION OF RISKS

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with TxDOT and the three owners of the land parcels needed to build the access road.

FM 541 is one of the two main roadways going through the City of Poth. Road reconstruction will cause traffic disruptions and inconveniences for businesses due to limited alternative access points. Public meetings and flyers will help communicate construction impacts to affected businesses of any service interruption or inconvenience. The businesses near the project limits should be notified several weeks before the construction start date. Construction phasing and traffic control will be an important design component for this project.

NATURE BASED SOLUTION CONSIDERATION

There are no nature-based solutions for this project, however, Low Impact Development (LID) can be implemented along the roadway.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Damage Center 2- Project 2 Road Connection from Moss Point to Sunshine**
FMP ID: **----------**
Project Sponsor: **City of Poth**
Date: **2/6/2023**

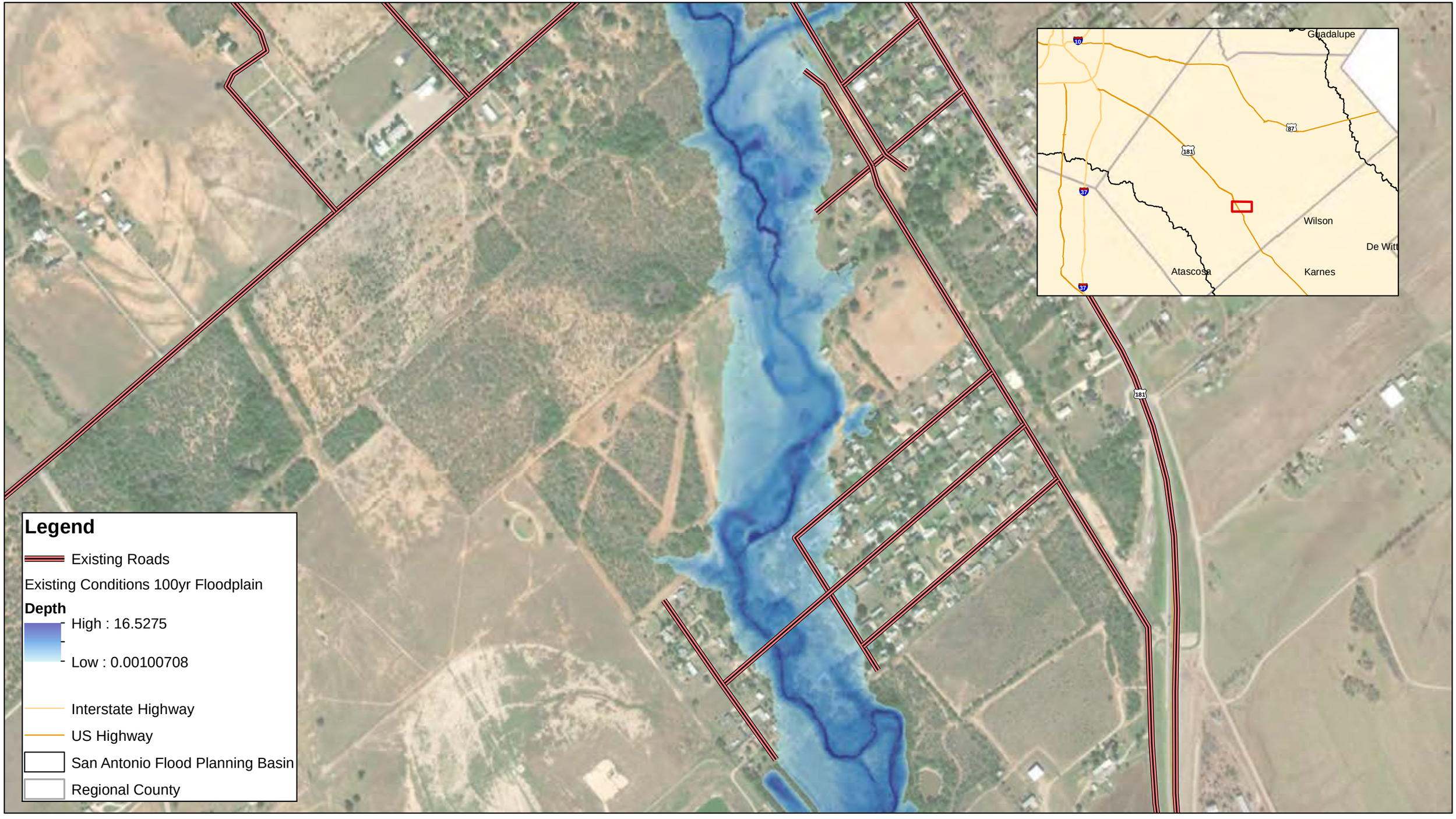
INTERRELATED PROJECTS

This project does not require any interrelated projects to be completed before this project can be constructed.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Project Name:	**Damage Center 1: Project 1A, B, C**
Project Sponsor:	**City of Poth**
Firm Developing:	**0**
Date Developed:	**2/10/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- STREET COST	**$724,344.32**
- TREE PRESERVATION (2%)	**$14,486.89**
- LANDSCAPING (10%)	**$72,434.43**
- BOND AND INSURANCE (3%)	**$24,337.97**
- BARICADES (3%)	**$25,068.11**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$121,689.85**
TOTAL CONSTRUCTION COST ESTIMATE	**$982,361.56**
ENGINEER FEE (Fee Table plus 5%)	**$176,825.08**
ENGINEER CONTINGENCY (10%)	**$17,682.51**
CONSTRUCTION CONTINGENCY (10%)	**$98,236.16**
PERMIT REQUIREMENT COSTS	**$8,000.00**
RIGHT-OF-WAY (LAND ACQUISITION)	**$68,550.00**
RIGHT-OF-WAY SURVEY	**$7,500.00**
ENVIRONMENTAL	**$10,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$19,647.23**
TOTAL PROJECT COST ESTIMATE	**$1,388,802.54**
DESIGN PHASE	$288,557.59
CONSTRUCTION PHASE	$1,100,244.95



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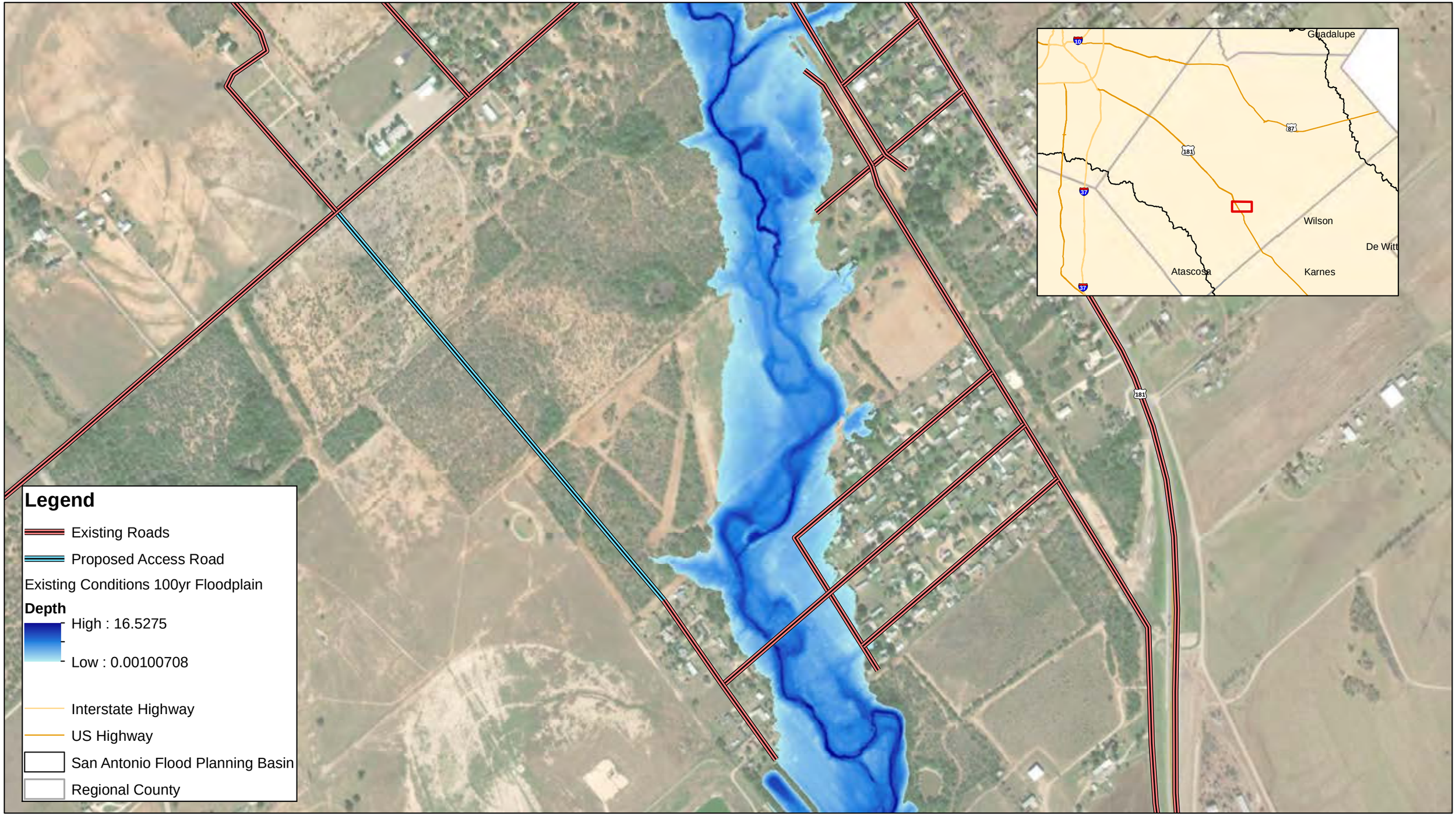
REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 1 - Mosspoint to Sunshine Existing Conditions

0 10 20
Miles

N



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REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 2 - Mosspoint to Sunshine Proposed Access Road

0 10 20
Miles

N

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Old Fredericksburg Road at Balcones Creek

FMP ID: 121000096

Project Sponsor: Kendall County/Bexar County

Project Source: Kendall County/Bexar County

Cost Information

Category	Cost*
Design	$1,412,860
Real Estate	$264,039
Environmental	$10,000
Construction	$8,582,295
Total Cost**	**$10,270,000**

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
10-year storm	$ 105,699	$ -
50-year storm	$ 106,160	$ -
Total Benifits	**$ 131,511**	
BCA	**0**	

**Rounded up to the nearest thousand

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	50-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Roads (miles)	0.067	0.087	-
Critical	-	-	-
Others Note	N/A	N/A	N/A
SVI Score			-

LWC Level of Service Existing Vs. Proposed

Condition	Level of Service	50-Yr Depth Over Road (ft)
Existing	< 10-Yr	10.45
Proposed	50-Yr	0

Project Description:

At the Old Fredericksburg Road crossing with Balcones Creek, the road is currently overtopped by the 10-year flood event and flood waters reach a maximum depth of 10 feet. The length of roadway flooded is approximately 0.12 miles at the 100-year flood event. The proposed improvements include constructing a bridge to raise the roadway over the low water crossing at the intersection of Balcones Creek and Old Fredericksburg Road and roadway realignment to straighten the sharp curves that currently exist on Old Fredericksburg Road near the Balcones Creek crossing. The proposed bridge will safely pass the 50-year flood event and lower the depth of water overtopping the roadway during larger flood events. In addtion, a flood beacon will be added for safety. The proposed bridge will be approximately 400 feet in length with a connecting roadway realignment of 1350 feet that ties into the existing road. This project is near the county boundary of Bexar and Kendall Counties.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Old Fredericksburg Road at Balcones Creek - Low Water Crossing**
FMP ID: **----------**
Project Sponsor: **Kendall County/Bexar County**
Date: **2/6/2023**

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. Old Fredericksburg Road at Balcones Creek, FME ID 121000093, from Kendall County was expanded on during Task 12. The sponsor for this project is Kendall County/Bexar County.

The problem area is located along Old Fredericksburg Road at a low water crossing with Balcones Creek. Currently there is flooding over the roadway crossing and in the surrounding areas. The 10-year storm is currently overtopping the roadway crossing due to a lower grade in the terrain.

The work completed for the Old Fredericksburg Road project was an update to the cost estimate, roadway realignment, hydraulic analysis, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

At the Old Fredericksburg Road crossing with Balcones Creek, the road is currently overtopped by the 10-year flood event and flood waters reach a maximum depth of 10 feet. The length of roadway being flooded is approximately 0.12 miles. The proposed improvements include constructing a bridge to raise the roadway over the low water crossing at the intersection of Balcones Creek and Old Fredericksburg Road and road realignment to straighten the sharp curves that currently exist in Old Fredericksburg Road near the Balcones Creek crossing. The proposed bridge will safely pass the 10-year flood event and lower the depth of water overtopping the roadway during larger flood events. Due to right of way and topography constraints, the 100-year design was not considered for this proposed project. Instead, a flood beacon will be added for safety. The proposed bridge will be approximately 400 feet in length with a connecting roadway realignment of 1350 feet that ties into the existing road.

PROPOSED PROJECT SCOPING COST

Refer to the Regional Flood Plan Cost Estimate for documented assumptions and methodologies on project costs.

The estimated project costs for Old Fredericksburg Road at Balcones Creek LWC improvements are $10,269,194, this was calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will eliminate overtopping at Old Fredericksburg Road for the 10-year and 50-year storm events by raising the roadway to provide conveyance. The bridge pier design will provide minimal obstruction to the water floodway and remove roadway out of the floodplain. The bridge is designed to have no adverse impact; therefore, the structure will not change the floodplain extents.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Old Fredericksburg Road at Balcones Creek - Low Water Crossing**
FMP ID: **----------**
Project Sponsor: **Kendall County/Bexar County**
Date: **2/6/2023**

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis.

The benefits that were evaluated for this project are, residential buildings, commercial buildings, and recreational. The resulting benefit cost analysis was 0.0. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit

Project Useful Life	30

Event Damages	Baseline	Project
10 – year storm	$105,699	$0
50-year storm	$106,160	$0

Total Benefits from BCA Toolkit	$113,511
Other Benefits (Not Recreation)	$24,731
Recreation Benefits	-
Total Costs	$8,729,153
Net Benefits	-$8,572,911
Net Benefits with Recreation	-$8,572,911
Final BCR	0.0
Final BCR with Recreation	0.0

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

Existing and proposed conditions were analyzed for impact, the impacts that were evaluated are the water surface elevations (WSE) and velocities +/-2000ft of this project area. The WSE and velocities were compared in the HEC-RAS v6.2.0 model and the proposed conditions showed reduced levels with both components. From

the RAS results, the total inundated boundary was reduced in proposed conditions, see Exhibits 1-3 for existing, proposed, and an US view of the comparison of WSE. Flooded depths over the road were evaluated in the BCA, reduced impacts show lower flooded depths in proposed conditions. The following table summarizes the level of service pre and post project;

Table 2: Level of Service Existing Vs. Proposed

Condition	Level of Service	10-Yr Depth Over Road (ft)
Existing	< 10-Yr	6.8 ft
Proposed	10-Yr	0

PROJECT RISKS

ROW/Real Estate Acquisition:

Yes, land acquisition is required.

Utilities Coordination:

Yes, there is possible utility conflict running underground along Old Fredericksburg Road. The proposed bridge would cause them to relocate.

Permitting/Environmental:

Yes, a USACE nationwide permit will be required. In addition, this area is part of the Glen Rose Limestone Formation, more specifically the Middle Trinity Aquifer. This aquifer is highly cavernous and includes many sink holes, and other karst features. According to the Texas Water Development Board, the Trinity Aquifer is one of the most extensive and highly used groundwater resources in Texas. Although its water is primarily used by municipalities, it also is used for irrigation, livestock, and other domestic purposes. Any proposed project should be cognizant that groundwater and surface water supplies cannot be threatened by any proposed County mobility enhancements and must be protected.

Stakeholder coordination:

Coordination and permitting process should be started early on with USACE and property owner acquisitions to avoid schedule delays. The realignment of the roadway will cut through a property and require acquisition.

Old Fredericksburg Road is a low-traffic area and provides access to rural residential communities and a few businesses. Road reconstruction will cause traffic disruptions and inconveniences for a few private entities. Public meetings and fliers will help communicate construction impacts to affected businesses of any service interruption or inconvenience. Any businesses near the project limits should be notified

several weeks before the construction start date. Construction phasing and traffic control will be an important design component for this project.

MITIGATION OF RISKS

Utility Coordination:

The utility coordinator will need to closely work with the affected utility companies to ensure timely completion of the proposed project. The project manager and contractor should minimize, as much as feasible, the amount of disruption of services and travel.

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with USACE and property owner acquisitions to avoid schedule delays. The realignment of the roadway will cut through a property and require acquisition.

Old Fredericksburg Road is a low-traffic area and provides access to rural residential communities and a few businesses. Road reconstruction will cause traffic disruptions and inconveniences for a few private entities. Public meetings and fliers will help communicate construction impacts to affected businesses of any service interruption or inconvenience. Any businesses near the project limits should be notified several weeks before the construction start date. Construction phasing and traffic control will be an important design component for this project.

NATURE BASED SOLUTION CONSIDERATION

The proposed project employs a bridge instead of a low water crossing. Using a bridge benefits the natural ecosystem by allowing more sediment transport, passage of aquatic organisms and does not impound water. The larger opening also allows for natural substrate to cover the culvert bottom to allow for aquatic organism passage.
Landscaping cost (10% of total construction cost) was factored into the total cost for potential channel stabilization and NBS solutions.

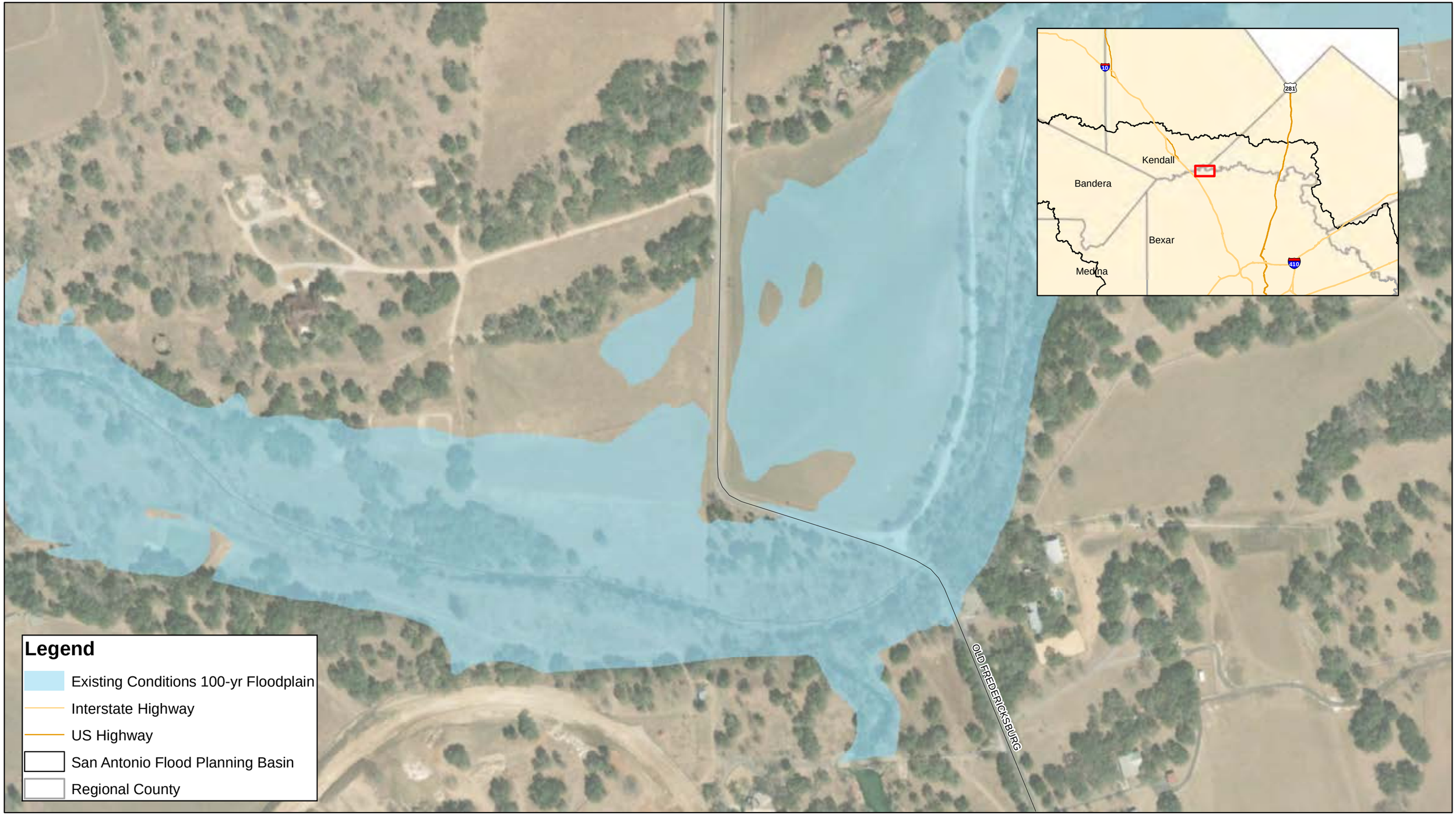
INTERRELATED PROJECTS

This project does not require any interrelated projects to be completed before this project can be constructed.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Project Name:	**Old Fredericksburg Road at Balcones Creek**
Project Sponsor:	**Kendall County**
Firm Developing:	**HALFF**
Date Developed:	**2/10/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- DRAINAGE COST	**$4,384,429.76**
- TREE PRESERVATION (2%)	**$113,509.52**
- LANDSCAPING (10%)	**$567,547.60**
- BOND AND INSURANCE (3%)	**$190,695.99**
- BARICADES (3%)	**$196,416.87**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$953,479.97**
TOTAL CONSTRUCTION COST ESTIMATE	**$7,697,125.93**
ENGINEER FEE (Fee Table plus 5%)	**$1,193,054.52**
ENGINEER CONTINGENCY (10%)	**$119,305.45**
CONSTRUCTION CONTINGENCY (10%)	**$769,712.59**
PERMIT REQUIREMENT COSTS	**$50,500.00**
RIGHT-OF-WAY (LAND ACQUISITION)	**$261,538.80**
RIGHT-OF-WAY SURVEY	**$2,500.00**
ENVIRONMENTAL	**$10,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$115,456.89**
TOTAL PROJECT COST ESTIMATE	**$10,269,194.19**
DESIGN PHASE	$1,686,898.77
CONSTRUCTION PHASE	$8,582,295.42



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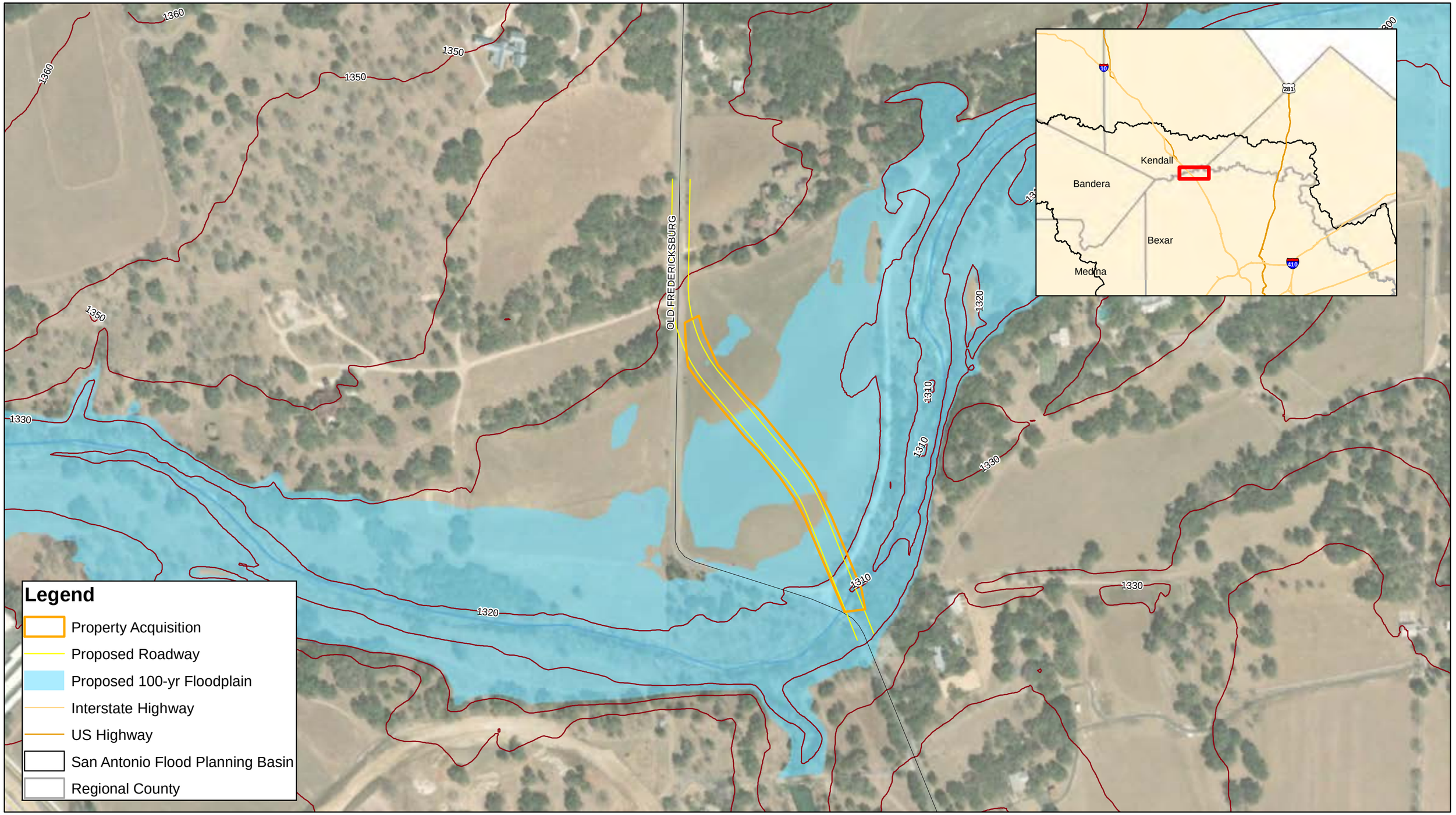
REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 1 - Old Fredericksburg LWC Existing Conditions

0 12.5 25
Miles

N



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REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 2 - Old Fredericksburg Road LWC Proposed Conditions

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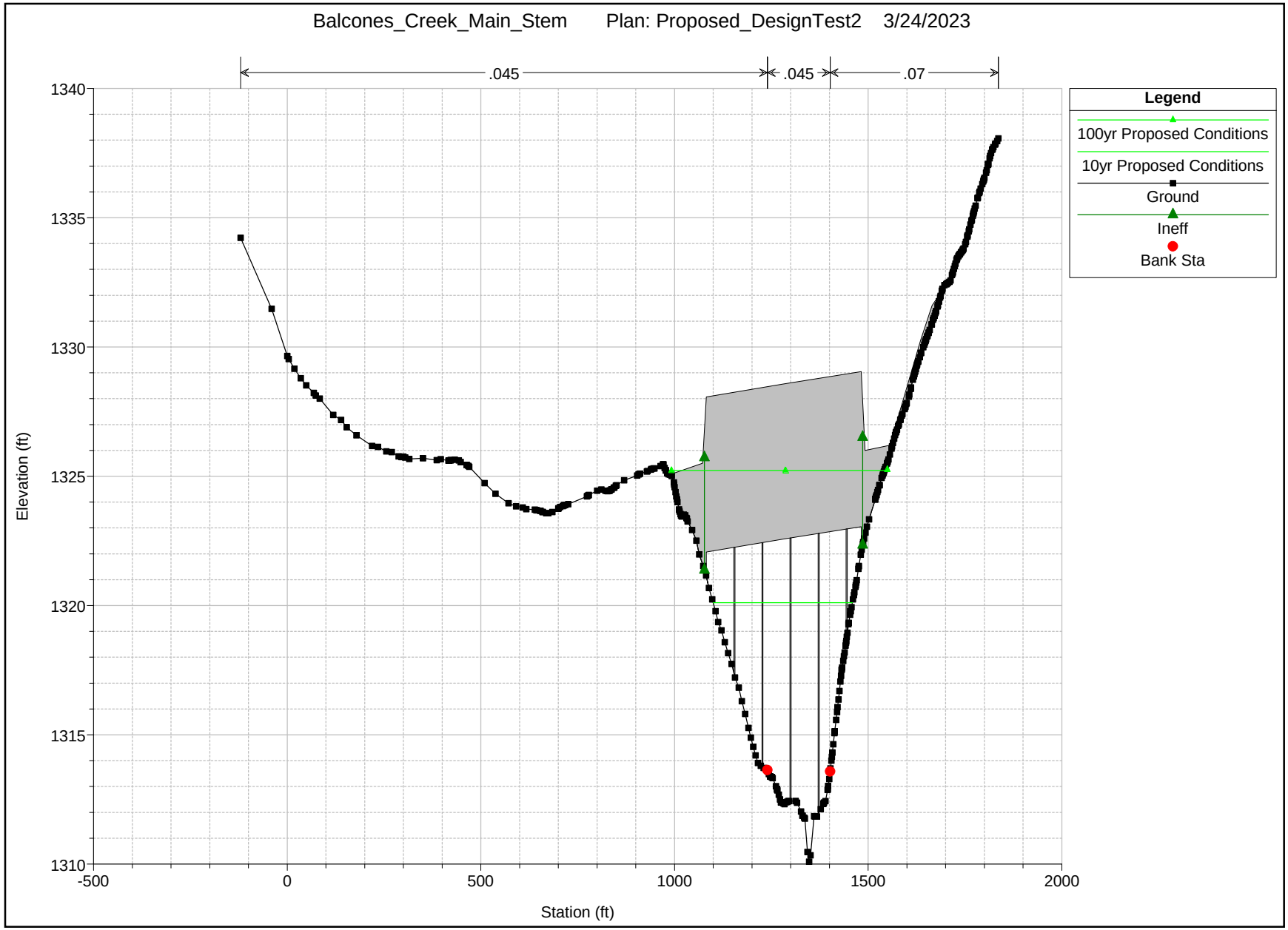
Miles

N


Balcones_Creek_Main_Stem Plan: Proposed_DesignTest2 3/24/2023
.045
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Legend
100yr Proposed Conditions
10yr Proposed Conditions
Ground
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Elevation (ft)
Station (ft)
1340
1335
1330
1325
1320
1315
1310
-500
0
500
1000
1500
2000

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: DeZavala/Ripple Creek

FMP ID: ----------

Project Sponsor: City of Shavano Park

Project Source: 2020 Preliminary Engineering Report

Cost Information

Category	Cost*
Design	$280,861.58
Real Estate	$0.00
Environmental	$10,000.00
Construction	$1,496,394.73
Total Cost**	**$1,788,000.00**

*Costs Adjusted using CCI

**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
25-year storm	$ 420,818	$ 297,492.00
100-year storm	$ 140,032	$ 126,140.00
Total Benefits	**$ 31,577**	
BCA	**0.0**	

Impact Analysis

Post-Project Total Removed	Storm Event		
	25-year	100-year	
Residential	4.00	1.00	
Commercial	N/A	N/A	
Critical	**N/A**	N/A	
Road (miles)	0.10	0.11	
Others Note	N/A	N/A	
SVI Score	N/A	N/A	

Project Description:

Currently a significant amount of runoff collects in a low spot along De Zavala Rd, northeast of Ripple Creek Rd. This pooled up storm water is then conveyed through a natural low which traverses behind almost two dozen homes towards Olmos Creek subjecting at least nine homes to varying degrees of flooding. The natural channel also crosses Ripple Creek Rd, rendering the roadway unnavigable by nearby residents during any storm event and relegating residents to alternative access points.

This project proposes an underground storm drain system that intercepts much of the runoff from the low at De Zavala Rd through a 4-way inlet and conveys it southwest towards an existing culvert crossing on De Zavala Rd where it then discharges into Olmos Creek.

This design is anticipated to remove a significant stretch of De Zavala Rd from the floodplain as well as at least one home from both the 25-year and 100-year floodplains.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **De Zavala/Ripple Creek**
FMP ID: **----------**
Project Sponsor: **City of Shavano Park**
Date: **2/3/2023**

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. Shavano Park Ripple Creek, from the 2020 Preliminary Engineering Report (PER) was expanded on during Task 12. The sponsor for this project is the City of Shavano Park.

The problem area is located along De Zavala Road and Ripple Creek Road, flooding flows across the residential area across De Zavala Road to Ripple Creek Road. Currently a ridge transects the neighborhood with a northwest portion of the residential property sheet flow moving onto existing lots along Bikeway Ln and the southwest portion of the residential sheet flows towards an existing low and culvert crossing located at De Zavala. From this crossing, flow enters an existing low that runs behind residences and crosses Ripple Creek Road, there are no structure within the flooded area.

The work that was completed for the De Zavala/Ripple Creek project was an update to the cost estimate, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

The proposed option to mitigate the drainage concerns with this area include capturing on the southern side of De Zavala with a storm drain and conveying the runoff along De Zavala and discharging into Olmos Creek at De Zavala. The construction of this storm drain would be within the De Zavala ROW and cross Painted Post Ln and several driveways located along De Zavala.

PROPOSED PROJECT SCOPING COST

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on project costs.

The estimated total project cost to be $1,775,380 in the 2020 City of Shavano Park Preliminary Engineering Report. The cost estimate was updated using the Construction Cost Index (CCI) of 1.008 from April 2020 to September 2020. The total project cost resulted to $1,787,256. There are underground utilities that require relocation and driveway acquisition that might require additional update. Currently, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will eliminate overtopping at De Zavala Rd and improve the level of service by providing a 100-year conveyance design. The storm drain system will improve the flooding on the surrounding roads and provide access during a storm event.

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis.

The benefits that were evaluated for this project is flooded streets. The resulting benefit cost analysis was 0. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **De Zavala/Ripple Creek**
FMP ID: **----------**
Project Sponsor: **City of Shavano Park**
Date: **2/3/2023**

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit		
Project Useful Life	30	
Event Damages	Baseline	Project
25 – year storm	$420,818	$297,492
100 - year storm	$140,926	$126,140
Total Benefits from BCA Toolkit	$31,577	
Other Benefits (Not Recreation)	$0	
Recreation Benefits	-	
Total Costs	$1,326,951	
Net Benefits	-$1,295,374	
Net Benefits with Recreation	-$1,295,374	
Final BCR	0.0	
Final BCR with Recreation	0.0	

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis. See Exhibits 1-3 for existing and proposed conditions.

There are no downstream impacts.

Table 2: Total Impacted Structures per Storm Frequency

Storm (Year)	Existing	Proposed	Difference
25	4	4	0
100	1	1	0

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **De Zavala/Ripple Creek**
FMP ID: **----------**
Project Sponsor: **City of Shavano Park**
Date: **2/3/2023**

PROJECT RISKS

ROW/Real Estate Acquisition:

No, land acquisition is not required.

Utilities Coordination:

Yes, there is possible utility conflict running underground along De Zavala Road. The proposed storm drain would cause them to relocate.

Permitting/Environmental:

Yes, a USACE nationwide permit will be required.

Stakeholder coordination:

Due to the road improvement, and utility relocation, the stakeholder will be involved in the process.

MITIGATION OF RISKS

Utility Coordination:

The utility coordinator will need to closely work with the affected utility companies to ensure timely completion of the proposed project. The project manager and contractor should minimize, as much as feasible, the amount of disruption of services and travel.

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with Shavano Park acquisitions to avoid schedule delays.

De Zavala and Ripple Road intersection is a main road into the several residential buildings. Road reconstruction will cause traffic disruptions and inconveniences for businesses due to limited alternative access points. Public meetings and fliers will help communicate construction impacts to affected businesses of any service interruption or inconvenience. The businesses near the project limits should be notified several weeks before the construction start date. Construction phasing and traffic control will be an important design component for this project.

NATURE BASED SOLUTION CONSIDERATION

Nature based solutions could be considered for this project. During design this project could incorporate natural channel design components and possible floodplain buffers. To preserve the open space, a park can be considered.

INTERRELATED PROJECTS

This project interrelates with other projects mentioned within the PER, but project completion will not depend on other projects.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Version: 7/2/2021

Project Name:	**De Zavala/Ripple Creek**
Project Sponsor:	**City of Shavano Park**
Firm Developing:	**KFW**
Person Developing:	**0**
Date Developed:	**2/10/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- DRAINAGE COST	**$984,030.45**
- TREE PRESERVATION (2%)	**$19,680.61**
- LANDSCAPING (10%)	**$98,403.05**
- BOND AND INSURANCE (3%)	**$33,063.42**
- BARICADES (3%)	**$34,055.33**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$165,317.12**
TOTAL CONSTRUCTION COST ESTIMATE	**$1,334,549.97**
ENGINEER FEE (Fee Table plus 5%)	**$226,873.49**
ENGINEER CONTINGENCY (10%)	**$22,687.35**
CONSTRUCTION CONTINGENCY (10%)	**$133,455.00**
PERMIT REQUIREMENT COSTS	**$33,000.00**
ENVIRONMENTAL	**$10,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$26,691.00**
TOTAL PROJECT COST ESTIMATE	**$1,787,256.81**
DESIGN PHASE	$292,560.84
CONSTRUCTION PHASE	$1,494,373.85

EXHIBIT 1

RIPPLE CREEK DRAINAGE IMPROVEMENTS

EXISTING CONDITIONS

Key to Features

- Proposed Storm Drain
- Houses
- Existing 100-yr Floodplain

N

W E

S

1 in = 200 ft

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Map Document: (Parcels_Affected) 11/8/2006 -- 2:22:32 PM

EXHIBIT 2

RIPPLE CREEK DRAINAGE IMPROVEMENTS

PROPOSED CONDITIONS

Key to Features

- Proposed Storm Drain
- Houses
- Proposed 100-yr Floodplain

N

W E

S

1 in = 200 ft

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Map Document: (Parcels_Affected) 11/8/2006 -- 2:22:32 PM

EXHIBIT 3

RIPPLE CREEK DRAINAGE IMPROVEMENTS

EX. AND PROP. CONDITIONS

Key to Features

- Proposed Storm Drain
- Houses
- Proposed 100-yr Floodplain
- Existing 100-yr Floodplain

N
W E
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1 in = 200 ft

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2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Specht & Obst Road at Cibolo Creek

FMP ID:

Project Sponsor: Bexar County/Comal County

Project Source: Bexar County/Comal County

Cost Information

Category	Cost*
Design	$695,091
Real Estate	$21,182
Environmental	$10,000
Construction	$3,766,868
Total Cost**	**$4,494,000**

*Costs from 2020 prices
**Rounded up to the nearest thousand

Benefit Cost Analysis (BCA)

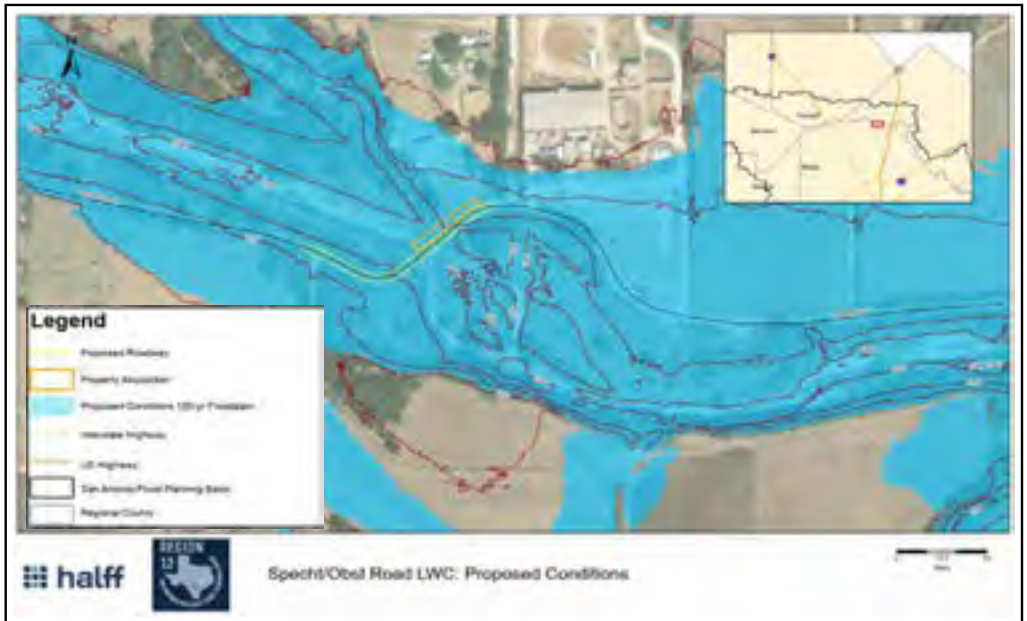
Event Damages	Baseline	Project
2-year storm	$ 378,726	$ 1,494
10-year storm	$ 378,726	$ 189,363
100-year storm	$ 378,726	$ 189,363
Total Benefits	**$ 2,031,323**	
BCA	**0.5**	

Impact Analysis

Post-Project Total Removed	Storm Event		
	2-year	10-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Roads (miles)	0.08	-	-
Critical	-	-	-
Others Note	1 Death		
SVI Score			-

LWC Level of Service Existing Vs. Proposed

Condition	Level of Service	2-Yr Depth Over Road (ft)
Existing	< 2-Yr	8
Proposed	2-Yr	0



Project Description:

At the Specht and Obst Road crossing with Cibolo Creek, the road is currently being overtopped by the 2-year flood event at a maximum depth of 7.8 ft. In 2010, there was a fatality at this crossing during a flash flood event. The length of roadway being flooded is approximately 2.2 miles. This project proposed construction of a bridge to raise the roadway over the low water crossing at the intersection of Cibolo Creek and Specht and Obst Road. The proposed bridge will safely pass the 2-year flood event and lower the depth of water overtopping the roadway for larger flood events. The proposed roadway and bridge alignment will raise the road for residents in the proximity of Cibolo Creek crossing and access will be required to properly tie in adjoining driveways to the proposed raised roadway. In addtion, a flood beacon will be added for safety at higher flood events. The proposed bridge will be approximately 270' in length with a connecting roadway realignment of 470' that ties into the existing road. This project is located at the Bexar County/Comal County line.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Specht & Obst Road at Cibolo Creek - Low Water Crossing**
FMP ID: **----------**
Project Sponsor: **Bexar/Comal County**
Date: **3/3/2023**

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. Specht & Obst Road at Cibolo Creek, FMP ID not yet created, from Bexar/Comal County was expanded on during Task 12. The sponsor for this project is Bexar County.

The problem area is located along Specht & Obst Road at a low water crossing with Cibolo Creek. Currently there is flooding over the roadway crossing and in the surrounding areas. The 10-year storm is currently overtopping the roadway crossing due to a lower grade in the terrain.

The work completed for the Specht & Obst Road at Cibolo Creek project was an update to the cost estimate, roadway realignment, hydraulic analysis, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

At the Specht and Obst Road crossing with Cibolo Creek, the road is overtopped by the 2-year flood event at a maximum depth of 7.8 ft. In 2010, there was a fatality at this crossing during a flash flood event. The length of roadway flooded is approximately 2.2 miles. This project proposed includes construction of a bridge to raise the roadway over the low water crossing at the intersection of Cibolo Creek and Specht and Obst Road. The proposed bridge will safely pass the 2-year flood event and lower the depth of water overtopping the roadway for larger flood events. The proposed roadway and bridge alignment will raise the road for residents in the proximity of Cibolo Creek crossing and access will be required to properly tie in adjoining driveways to the proposed raised roadway. Due to right of way and topography constraints, the 100-year design was not considered for this proposed project. Instead, a flood beacon will be installed for added safety during higher flood events. The proposed bridge will be approximately 270' in length with a connecting roadway realignment of 470' that ties into the existing road. This project is located at the Bexar County/Comal County line.

PROPOSED PROJECT SCOPING COST

Refer to the Regional Flood Plan Cost Estimate for documented assumptions and methodologies on project costs.

The estimated project costs for the Specht & Obst Road at Cibolo Creek LWC improvements are $4,494,000, calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will eliminate overtopping at Specht & Obst Road for the 2-year storm event by raising the roadway to provide conveyance. The bridge pier design will provide minimal obstruction to the water floodway and remove the roadway out of the floodplain. The bridge is designed to have no adverse impact; therefore, the structure will not change the floodplain extents.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Specht & Obst Road at Cibolo Creek - Low Water Crossing**
FME ID: **----------**
Project Sponsor: **Bexar/Comal County**
Date: **3/3/2023**

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis. The benefits that were evaluated for this project are residential buildings, commercial buildings, and recreational. The resulting benefit cost analysis was 0.5. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit

Project Useful Life 30

Event Damages	Baseline	Project
2 – year storm	$378,726	$1,494
10 – year storm	$378,726	$189,363
100 - year storm	$378,726	$189,363

Total Benefits from BCA Toolkit	$2,031,323
Other Benefits (Not Recreation)	$1,984
Recreation Benefits	-
Total Costs	$3,820,203
Net Benefits	-$1,786,896
Net Benefits with Recreation	-$1,786,896
Final BCR	0.5
Final BCR with Recreation	0.5

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

Existing and proposed conditions were analyzed for impact and the impacts that were evaluated are the water surface elevations (WSE) and velocities +/-2000ft of this project area. The WSEL and velocities were compared in the HEC-RAS v6.2.0 model. The proposed conditions showed reduced levels with both components. From the RAS results, the total inundated boundary was reduced in proposed conditions. See Exhibits 1- 3 for existing,

proposed, comparison of WSEL, and proposed alignment. Flooded depths over the road were evaluated in the BCA with reduced impacts of lower flood depths in proposed conditions. The following table summarizes the level of service pre and post project:

Table 2: Level of Service Existing vs. Proposed

Condition	Level of Service	2-Yr Depth Over Road (ft)
Existing	< 2-Yr	8
Proposed	2-Yr	0

(See full list of impacts in the attached BCA results as well as Table 2: Level of Service Existing vs. Proposed)

PROJECT RISKS

ROW/Real Estate Acquisition:

Yes, land acquisition is required.

Utilities Coordination:

No.

Permitting/Environmental:

Yes, a USACE nationwide permit will be required.

Stakeholder coordination:

Due to the land acquisition, road improvement, and drainage considerations, there will be one stakeholder involved that owns the area where all of the construction will tentatively occur.

MITIGATION OF RISKS

Utility Coordination:

n/a

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with USACE and property owner acquisitions to avoid schedule delays.

Specht & Obst Road is a low-traffic area. Road reconstruction will cause traffic disruptions and inconveniences for a few private entities. Public meetings and flyers will help communicate construction impacts to affected businesses of any service interruption or inconvenience. Any businesses near the project limits should be notified several weeks before the construction start date. Construction phasing and traffic control will be an important design component for this project.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Specht & Obst Road at Cibolo Creek - Low Water Crossing**
FME ID: **----------**
Project Sponsor: **Bexar/Comal County**
Date: **3/3/2023**

NATURE BASED SOLUTION CONSIDERATION

The proposed project employs a bridge instead of a low water crossing. Using a bridge benefits the natural ecosystem by allowing more sediment transport, passage of aquatic organisms and does not impound water. The larger opening also allows for natural substrate to cover the culvert bottom to allow for aquatic organism passage.

Landscaping cost (10% of total construction cost) was factored into the total cost for potential channel stabilization and NBS solutions.

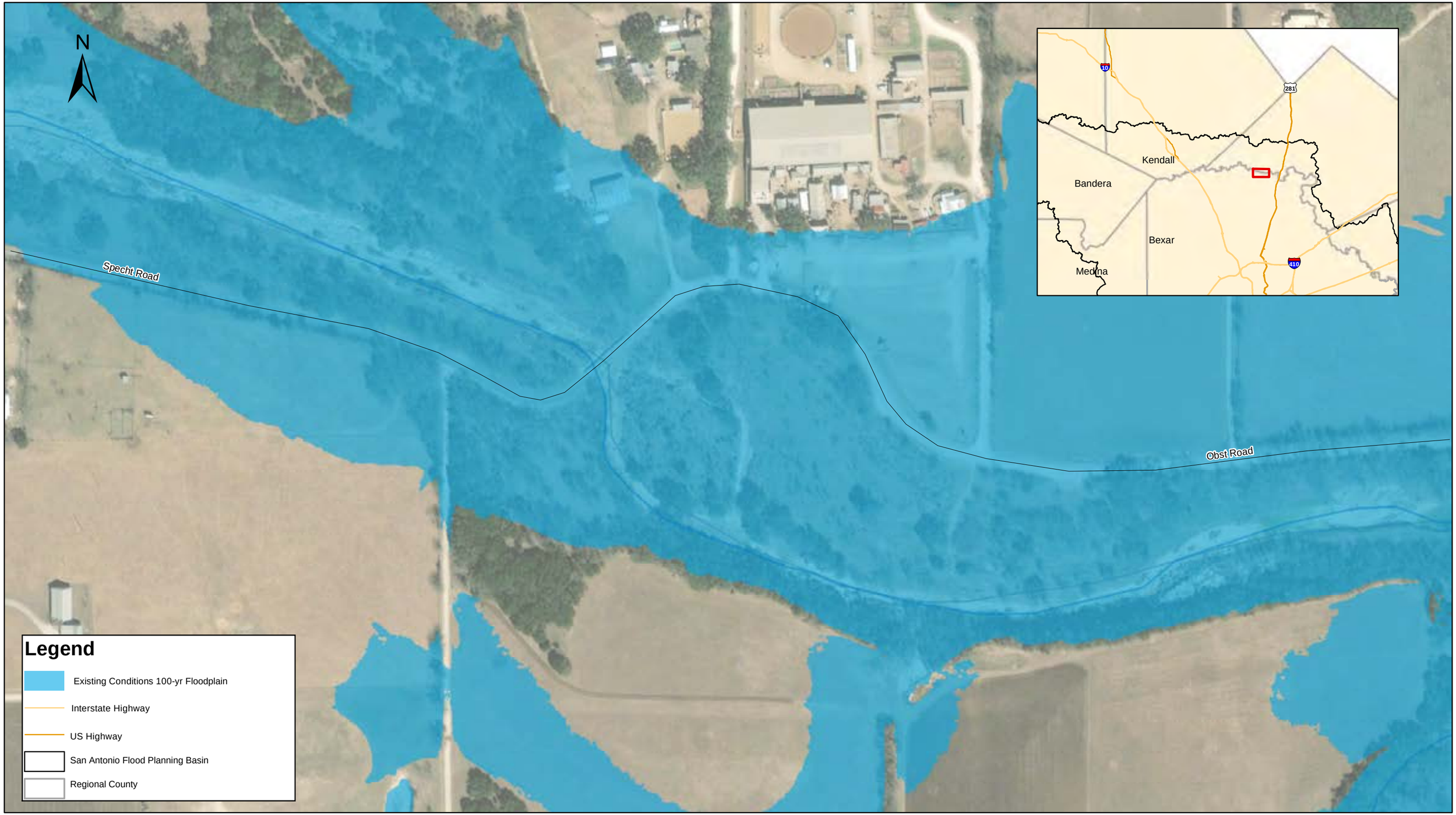
INTERRELATED PROJECTS

This project does not require any interrelated projects to be completed before this project can be constructed.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Project Name:	**Specht & Obst Road at Cibolo Creek**
Project Sponsor:	**Bexar/Comal County**
Firm Developing:	**HALFF**
Date Developed:	**2/10/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- DRAINAGE COST	**$2,028,242.35**
- TREE PRESERVATION (2%)	**$49,820.63**
- LANDSCAPING (10%)	**$249,103.13**
- BOND AND INSURANCE (3%)	**$83,698.65**
- BARICADES (3%)	**$86,209.61**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$418,493.26**
TOTAL CONSTRUCTION COST ESTIMATE	**$3,378,356.56**
ENGINEER FEE (Fee Table plus 5%)	**$540,537.05**
ENGINEER CONTINGENCY (10%)	**$54,053.70**
CONSTRUCTION CONTINGENCY (10%)	**$337,835.66**
PERMIT REQUIREMENT COSTS	**$50,500.00**
RIGHT-OF-WAY (LAND ACQUISITION)	**$18,682.00**
RIGHT-OF-WAY SURVEY	**$2,500.00**
ENVIRONMENTAL	**$10,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$50,675.35**
TOTAL PROJECT COST ESTIMATE	**$4,493,140.32**
DESIGN PHASE	$726,272.75
CONSTRUCTION PHASE	$3,766,867.56



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REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 1 - Specht/Obst Road LWC: Existing Conditions

0 12.5 25
Miles

N

Specht Road

Obst Road

1120
1110
1090
1080
1100

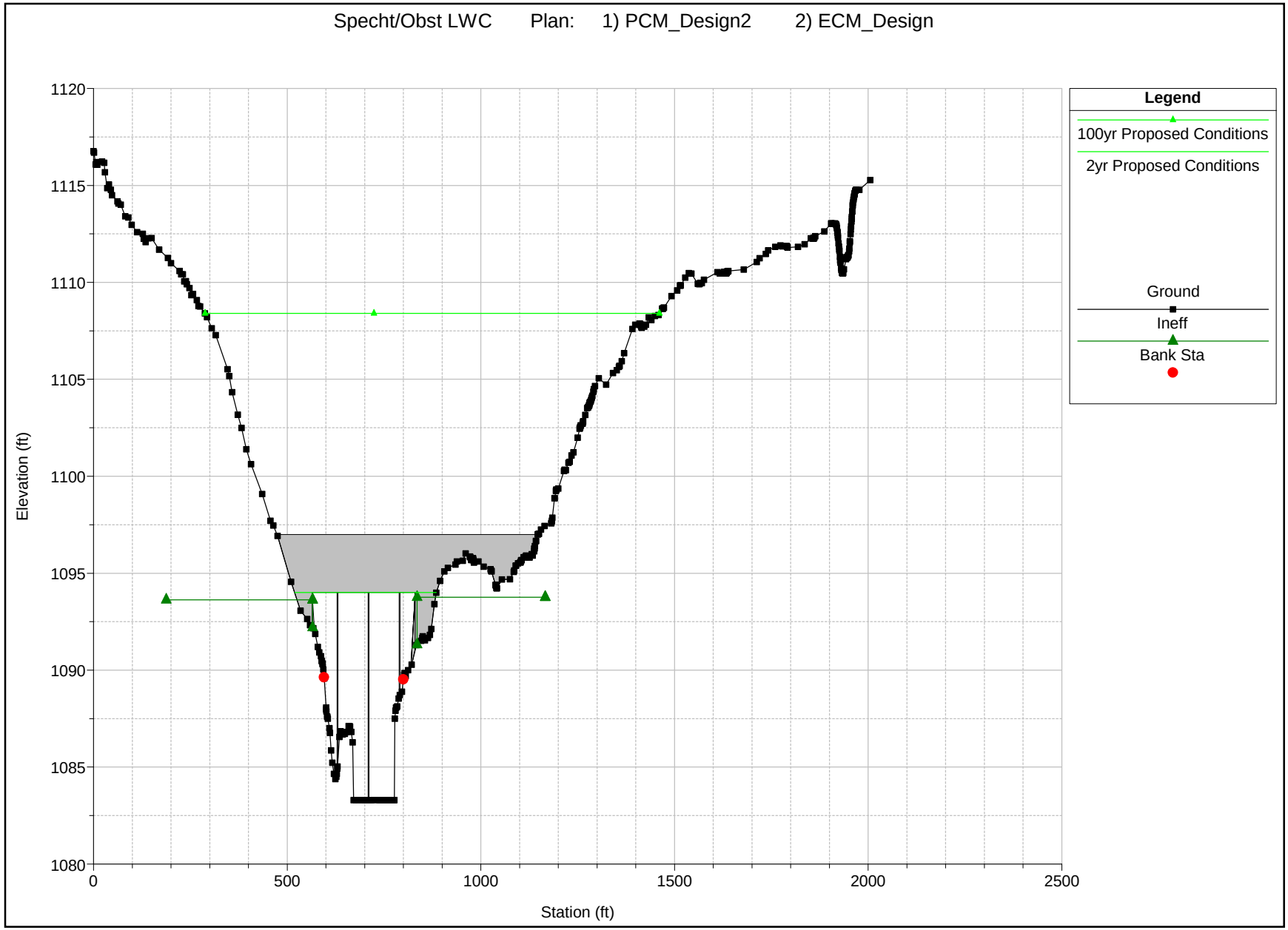
Kendall
Bandera
Bexar
Medina
10
281
410

Legend

- Proposed Roadway
- Property_Acquisition
- Proposed Conditions 100-yr Floodplain
- Interstate Highway
- US Highway
- San Antonio Flood Planning Basin
- Regional County

0 12.5 25
Miles

Exhibit 2 - Specht/Obst Road LWC: Proposed Conditions


Specht/Obst LWC Plan: 1) PCM_Design2 2) ECM_Design
Legend
100yr Proposed Conditions
2yr Proposed Conditions
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1120
1115
1110
1105
1100
1095
1090
1085
1080
0
500
1000
1500
2000
2500

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Toutant Beauregard at Balcones Creek

FMP ID: ----------

Project Sponsor: Kendall County/Bexar County

Project Source: Kendall County/Bexar County

Cost Information

Category	Cost*
Design	$577,048
Real Estate	$118,550
Environmental	$10,000
Construction	$2,940,681
Total Cost**	**$3,647,000**

Benefit Cost Analysis (BCA)

Event Damages	Baseline	Project
10-year storm	$ 209,868	$ -
50-year storm	$ 209,868	$ 66,145
Total Benefits	**$ 243,677**	
BCA	**0.1**	

**Rounded up to the nearest thousand

Impact Analysis

Post-Project Total Removed	Storm Event		
	10-year	50-year	100-year
Residential	-	-	-
Commercial	-	-	-
Flooded Roads (miles)	0.045	-	-
Critical	-	-	-
Others Note	N/A	N/A	N/A
SVI Score			-

LWC Level of Service Existing Vs. Proposed

Condition	Level of Service	10-Yr Depth Over Road (ft)
Existing	< 10-Yr	7.5
Proposed	10-Yr	0

Project Description:

At the Toutant Beauregard crossing with Balcones Creek, the road is currently being overtopped by the 10-year flood event at a maximum depth of 7.5 ft. The length of roadway being flooded is approximately 0.065 miles at the 100-year flood event. Constructing a bridge to raise the roadway over the low water crossing at the intersection of Balcones Creek and Toutant Beauregard. In addition, a flood beacon will be added for safety. The proposed bridge will overtop the 10-year flood event and lower the depth of water overtopping the roadway for larger flood events. The proposed roadway and bridge alignment will straighten the sharp curves that currently exist in Toutant Beauregard over the Balcones Creek crossing and move the curve or the road out to the abutting property. The proposed bridge will be approximately 150' in length with a connecting roadway realignment of 450' that ties into the existing road. Project is located at the Kendall County/Bexar County line.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Toutant Beauregard at Balcones Creek - Low Water Crossing**
FMP ID: **----------**
Project Sponsor: **Kendall County**
Date: **3/3/2023**

BACKGROUND INFORMATION:

As part of the amended 2023 San Antonio Regional Flood Plan (the Plan), Task 12 expands on previously identified FMEs from the Plan dated January 10th, 2023. Toutant Beauregard at Balcones Creek, FMP ID not yet created, from Kendall County was expanded on during Task 12. The sponsor for this project is Kendall County.

The problem area is located along Toutant Beauregard at a low water crossing with Balcones Creek. Currently there is flooding over the roadway crossing and in the surrounding areas. The 10-year storm is currently overtopping the roadway crossing. The project location is at the Kendall County/Bexar County line.

The work completed for the Toutant Beauregard at Balcones Creek project was an update to the cost estimate, roadway realignment, hydraulic analysis, and a Benefit Cost Analysis (BCA).

PROPOSED PROJECT SCOPE

At the Toutant Beauregard crossing with Balcones Creek, the road is currently being overtopped by the 10-year flood event at a maximum depth of 7.5 ft. The length of roadway being flooded is approximately 0.065 miles. Constructing a bridge to raise the roadway over the low water crossing at the intersection of Balcones Creek and Toutant Beauregard. The proposed bridge will convey the 10-year flood event and lower the depth of water overtopping the roadway for larger flood events. Due to right of way and topography constraints, the 100-year design was not considered for this proposed project. Instead, a flood beacon will be installed for added safety. The proposed roadway and bridge alignment will straighten the sharp curves that currently exist in Toutant Beauregard over the Balcones Creek crossing and move the curve or the road out to the abutting property. In addition, a flood beacon will be added for safety. The proposed bridge will be approximately 150' in length with a connecting roadway realignment of 450' that ties into the existing road.

PROPOSED PROJECT SCOPING COST

Refer to the Regional Flood Plan Cost Estimate for documented assumptions and methodologies on project costs.

The estimated project costs for the Toutant Beauregard Road at Balcones Creek LWC improvements are $3,647,000, this was calculated using 2020 prices. The cost includes all the required applicable TWDB FMP costs including basic engineering fees, special services such as surveying, environmental, geotech, etc., other costs such as land/easement acquisition and administration, fiscal services, and contingency. See attached Cost Summary for cost breakdown. If there are underground utilities that require adjustments, this may increase depending upon any additional adjustments required. At this time, funding for the project has not been identified or approved.

PROPOSED PROJECT BENEFITS

This project will eliminate overtopping at Toutant Beauregard for the 10-year storm event by raising the roadway to provide conveyance. The bridge pier design will provide minimal obstruction to the water floodway and remove roadway out of the floodplain. The bridge is designed to have no adverse impact; therefore, the structure will not change the floodplain extents.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Toutant Beauregard at Balcones Creek - Low Water Crossing**
FMP ID: **----------**
Project Sponsor: **Kendall County**
Date: **3/3/2023**

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on benefit cost analysis.

The benefits that were evaluated for this project are, residential buildings, commercial buildings, and recreational. The resulting benefit cost analysis was 0.1. The Table 1 below summarizes the components calculated in the TWDB BCA Tool.

Table 1: TWDB BCA Toolkit

Input Into BCA Toolkit

Project Useful Life 30

Event Damages	Baseline	Project
10 – year storm	$209,868	$0
50 – year storm	$209,868	$66,145

Total Benefits from BCA Toolkit	$243,677
Other Benefits (Not Recreation)	$11,104
Recreation Benefits	-
Total Costs	$2,960,892
Net Benefits	-$2,706,111
Net Benefits with Recreation	-$2,706,111
Final BCR	0.1
Final BCR with Recreation	0.1

IMPACT ANALYSIS

Refer to the Amended Flood Plan Technical Memo for documented assumptions and methodologies on impact analysis.

Existing and proposed conditions were analyzed for impact, the impacts that were evaluated are the water surface elevations (WSE) and velocities +/-2000ft of this project area. The WSE and velocities were compared

in the HEC-RAS v6.2.0 model and the proposed conditions showed reduced levels with both components. From the RAS results, the total inundated boundary was reduced in proposed conditions, see Exhibits 1-3 for existing, proposed, and an US view of the comparison of WSE. Flooded depths over the road were evaluated in the BCA, reduced impacts show lower flooded depths in proposed conditions. The following table summarizes the level of service pre and post project:

Table 2: Level of Service Existing Vs. Proposed

Condition	Level of Service	10-Yr Depth Over Road (ft)
Existing	< 10-Yr	7.5
Proposed	10-Yr	0

PROJECT RISKS

ROW/Real Estate Acquisition:

Yes, land acquisition is required.

Utilities Coordination:

No.

Permitting/Environmental:

Yes, a USACE nationwide permit will be required. In addition, this area is part of the Glen Rose Limestone Formation, more specifically the Middle Trinity Aquifer. This aquifer is highly cavernous and includes many sink holes, and other karst features. According to the Texas Water Development Board, the Trinity Aquifer is one of the most extensive and highly used groundwater resources in Texas. Although its water is primarily used by municipalities, it also is used for irrigation, livestock, and other domestic purposes. Any proposed project should be cognizant that groundwater and surface water supplies cannot be threatened by any proposed County mobility enhancements and must be protected.

Stakeholder coordination:

Due to the land acquisition, road improvement, and drainage considerations, there will be one stakeholder involved that owns the area where all of the construction will tentatively occur.

Amended 2023 San Antonio Regional Flood Plan - Project Narrative

Project Name: **Toutant Beauregard at Balcones Creek - Low Water Crossing**
FMP ID: **----------**
Project Sponsor: **Kendall County**
Date: **3/3/2023**

MITIGATION OF RISKS

Stakeholder Coordination/Permitting:

Coordination and permitting process should be started early on with USACE and property owner acquisitions to avoid schedule delays.

Toutant Beauregard is a low-traffic area. Road reconstruction will cause traffic disruptions and inconveniences for a few private entities. Public meetings and fliers will help communicate construction impacts to affected businesses of any service interruption or inconvenience. Any businesses near the project limits should be notified several weeks before the construction start date. Construction phasing and traffic control will be an important design component for this project.

NATURE BASED SOLUTION CONSIDERATION

The proposed project employs a bridge instead of a low water crossing. Using a bridge benefits the natural ecosystem by allowing more sediment transport, passage of aquatic organisms and does not impound water. The larger opening also allows for natural substrate to cover the culvert bottom to allow for aquatic organism passage.

Landscaping cost (10% of total construction cost) was factored into the total cost for potential channel stabilization and NBS solutions.

INTERRELATED PROJECTS

This project does not require any interrelated projects to be completed before this project can be constructed.

2023 SAN ANTONIO REGIONAL FLOOD PLAN
PROJECT COST SUMMARY

Project Name:	**Toutant Beauregard at Balcones Creek**
Project Sponsor:	**Kendall County**
Firm Developing:	**HALFF**
Date Developed:	**2/10/2023**
Unit Prices Used:	**11/1/2020**

CONSTRUCTION COSTS	
- DRAINAGE COST	**$1,486,703.98**
- TREE PRESERVATION (2%)	**$38,719.85**
- LANDSCAPING (10%)	**$193,599.25**
- BOND AND INSURANCE (3%)	**$65,049.35**
- BARICADES (3%)	**$67,000.83**
- MOBILIZATION & PREPARATION OF R.O.W. (11% + 4%)	**$325,246.73**
TOTAL CONSTRUCTION COST ESTIMATE	**$2,625,608.48**
ENGINEER FEE (Fee Table plus 5%)	**$433,225.40**
ENGINEER CONTINGENCY (10%)	**$43,322.54**
CONSTRUCTION CONTINGENCY (10%)	**$262,560.85**
PERMIT REQUIREMENT COSTS	**$50,500.00**
RIGHT-OF-WAY (LAND ACQUISITION)	**$116,050.00**
RIGHT-OF-WAY SURVEY	**$2,500.00**
ENVIRONMENTAL	**$10,000.00**
MATERIAL TESTING (2% Construction Cost - <$3M, 1.5% - >$3M)	**$52,512.17**
TOTAL PROJECT COST ESTIMATE	**$3,646,279.43**
DESIGN PHASE	$705,597.94
CONSTRUCTION PHASE	$2,940,681.49

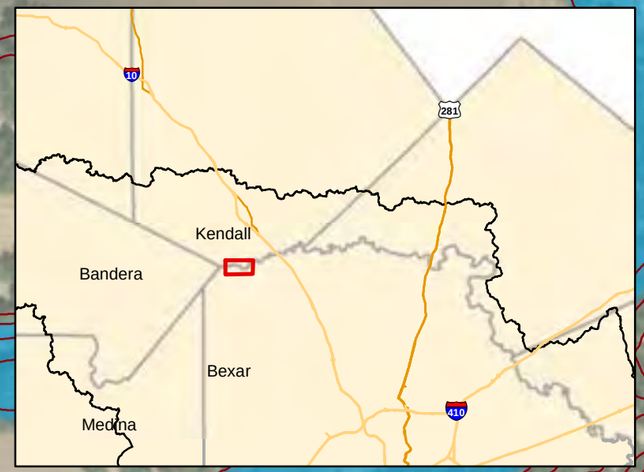
N

UPPER BALCONES

BALCONES

TOUTANT BEAUREGARD

1420
1470
1460
1520
1540
1560
1510
1480
1490
1550
1530
1500
1450
1470
1510
1520
1540
1530
1550



Legend

- Existing Conditions 100-yr Floodplain
- Interstate Highway
- US Highway
- San Antonio Flood Planning Basin
- Regional County

halff

REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 1 - Toutant Beauregard Road LWC: Existing Conditions

0 12.5 25
Miles

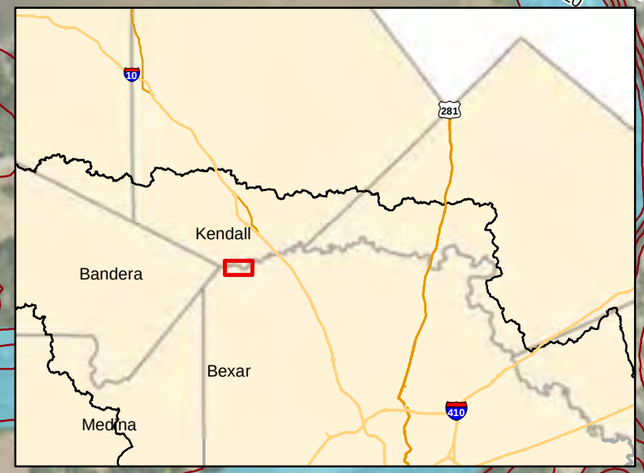
N

UPPER BALCONES

BALCONES

TOUTANT BEAUREGARD

1420
1440
1450
1460
1470
1480
1490
1500
1510
1520
1530
1540
1550
1560



Legend

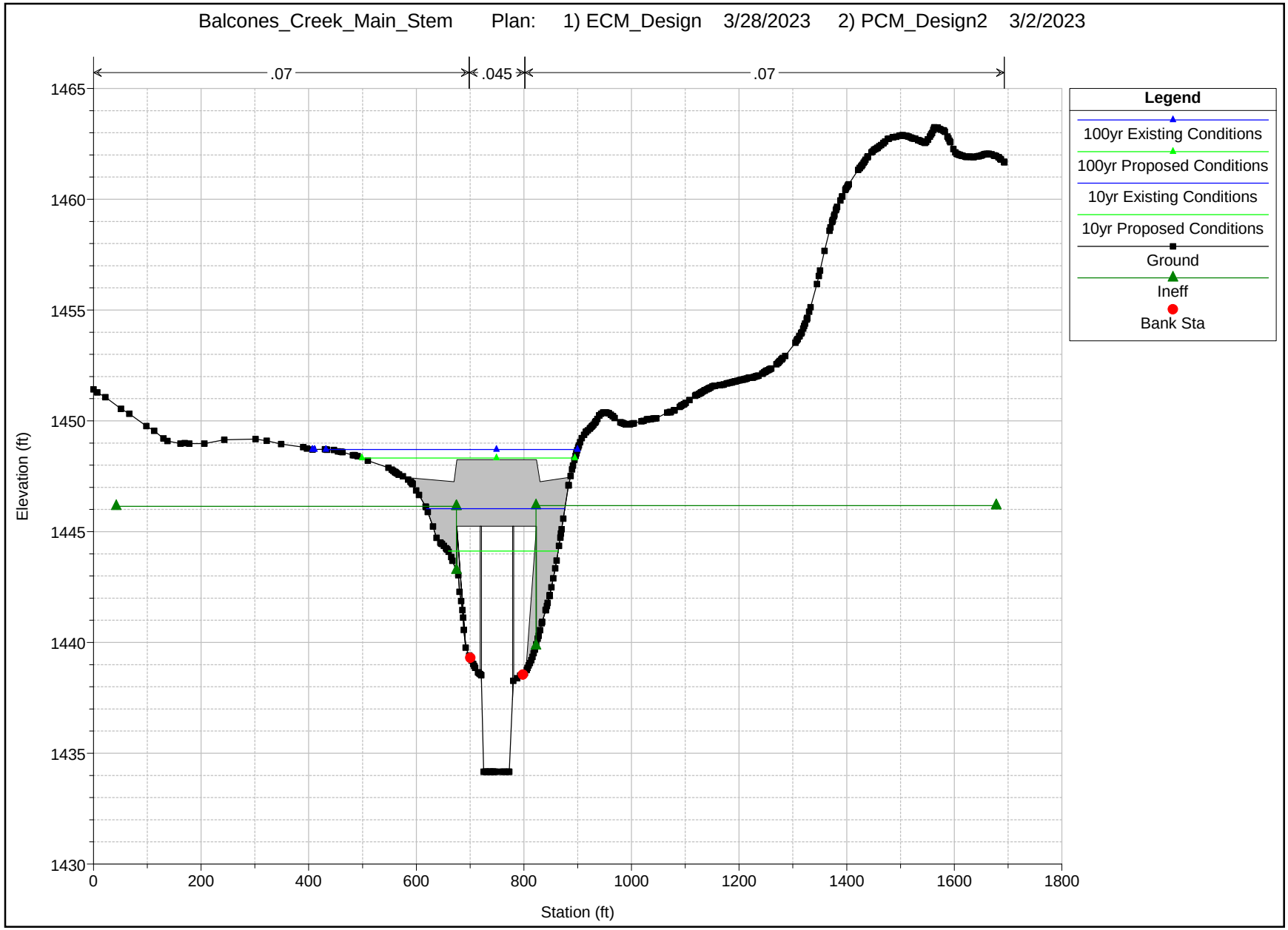
- Proposed Roadway
- Bridge Alignment
- Proposed 100-yr FP Limits
- Interstate Highway
- US Highway
- San Antonio Flood Planning Basin
- Regional County

halff

REGION 12 SAN ANTONIO REGIONAL FLOOD PLANNING GROUP

Exhibit 2 - Toutant Beauregard Road LWC: Proposed Conditions

0 12.5 25
Miles


Balcones_Creek_Main_Stem Plan: 1) ECM_Design 3/28/2023 2) PCM_Design2 3/2/2023
.07
.045
.07
Legend
100yr Existing Conditions
100yr Proposed Conditions
10yr Existing Conditions
10yr Proposed Conditions
Ground
Ineff
Bank Sta
Elevation (ft)
1465
1460
1455
1450
1445
1440
1435
1430
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

2023 San Antonio Regional Flood Plan
Project Summary Sheet

Project Name: Cibolo Creek Spill Study

FME ID: 12XXXXXX

Project Sponsor: Guadalupe County

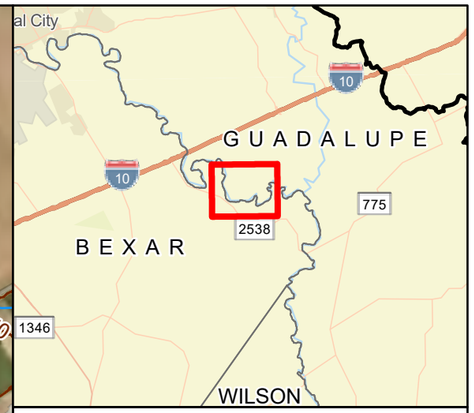
Project Source: 2022 Bexar County Drainage Needs

Study Type: Watershed Planning

Project Cost: (2020 Prices) $ 250,000

Project Description:

During the analysis of crossings at Bexar Bowling Way and Ullrich Road at Cibolo Creek, it was determined that a 2D hydraulic study flood study would be needed to evaluate spill flow from the creek. The spill starts 2,500ft upstream of the Bexar Bowling Way Crossing to 2,000ft north of Ullrich Road Crossing.
The project cost was developed using FME Planning Cost Estimates found in section 5.2.1.1 of the San Antonio Regional Flood Plan for Watershed Planning.
The study areas covers 1.2 square miles.



Legend

- Streams
- Contours (5ft.)
- Contours (10ft.)
- Proposed Study Area
- Building Footprints

100-Year Flood Depth (ft.)

- < 0.5
- 0.5 - 1
- 1 - 2
- > 2
- County Boundary

2023 SAN ANTONIO REGIONAL FLOOD PLAN

CIBOLO CREEK
SPILL STUDY

PROPOSED STUDY

N

0 375 750 1,500
FEET

REGION 12

HDR

APRIL 2023