

# Fort Bend County - Big Creek 2017 CDBG-DR Infrastructure Application

## Attachments

SF-424

Public Participation Summary

Resolution

Maps

Additional Information for the Infrastructure Application

Texas Division of Emergency Management (TDEM) DR 4332- HMGP Applicant Briefing slides

Tetra Tech HMGP Benefit Cost Analysis Memo for Big Creek

Beneficiary Information

2019 Low and Moderate Income Summary Data (LMISD)

Race/Ethnicity/Gender Calculator Form

American Fact Finder DP05 Table

Documentation of Hurricane Harvey related damage

Local Disaster Declaration

USGS Graphs – Big Creek Gauge at Hwy 36

Environmental Exception Form

Recent Audit

Key Staff Listing

Fort Bend County Purchasing Manual (local procurement policies and procedures)

### Application for Federal Assistance SF-424

<b>* 1. Type of Submission:</b> <input type="checkbox"/> Preapplication <input checked="" type="checkbox"/> Application <input type="checkbox"/> Changed/Corrected Application	<b>* 2. Type of Application:</b> <input checked="" type="checkbox"/> New <input type="checkbox"/> Continuation <input type="checkbox"/> Revision	<b>* If Revision, select appropriate letter(s):</b> <input type="text"/> <b>* Other (Specify):</b> <input type="text"/>
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<b>* 3. Date Received:</b> <input type="text"/>	<b>4. Applicant Identifier:</b> TX489157
--	---

<b>5a. Federal Entity Identifier:</b> <input type="text"/>	<b>5b. Federal Award Identifier:</b> <input type="text"/>
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**State Use Only:**

<b>6. Date Received by State:</b> <input type="text"/>	<b>7. State Application Identifier:</b> <input type="text"/>
--	--

**8. APPLICANT INFORMATION:**

<b>* a. Legal Name:</b> Port Bend County Texas	
<b>* b. Employer/Taxpayer Identification Number (EIN/TIN):</b> 74-6001969	<b>* c. Organizational DUNS:</b> 0000081497075

**d. Address:**

<b>* Street1:</b>	301 Jackson Street
<b>Street2:</b>	Suite 602
<b>* City:</b>	Richmond
<b>County/Parish:</b>	Port Bend County
<b>* State:</b>	TX; Texas <input checked="" type="checkbox"/>
<b>Province:</b>	
<b>* Country:</b>	USA: UNITED STATES
<b>* Zip / Postal Code:</b>	77469

**e. Organizational Unit:**

<b>Department Name:</b> Community Development	<b>Division Name:</b> <input type="text"/>
--	---

**f. Name and contact information of person to be contacted on matters involving this application:**

<b>Prefix:</b> Ms. <input checked="" type="checkbox"/>	<b>* First Name:</b> Marilyn
<b>Middle Name:</b>	
<b>* Last Name:</b> Kindell	
<b>Suffix:</b>	

<b>Title:</b> Community Development Department Director
---

<b>Organizational Affiliation:</b> <input type="text"/>
--

<b>* Telephone Number:</b> 281-341-4410	<b>Fax Number:</b> 281-341-3762
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<b>* Email:</b> marilynn.kindell@fortbendcountytexas.gov
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**Application for Federal Assistance SF-424**

**\* 9. Type of Applicant 1: Select Applicant Type:**

B: County Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

\* Other (specify):

**\* 10. Name of Federal Agency:**

U.S. Department of Housing and Urban Development (HUD)

**11. Catalog of Federal Domestic Assistance Number:**

14.228

CFDA Title:

Community Development Block Grant (CDBG) Program Disaster Recovery

**\* 12. Funding Opportunity Number:**

\* Title:

Hurricane Harvey Infrastructure Application Guide

**13. Competition Identification Number:**

Title:

**14. Areas Affected by Project (Cities, Counties, States, etc.):**

Add Attachment

Delete Attachment

View Attachment

**\* 15. Descriptive Title of Applicant's Project:**

Community Development Block Grant - Disaster Recovery (CDBG-DR) Infrastructure Program - Big Creek Expansion Project

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

**Application for Federal Assistance SF-424**

**16. Congressional Districts Of:**  
\* a. Applicant  \* b. Program/Project

Attach an additional list of Program/Project Congressional Districts if needed.

**17. Proposed Project:**  
\* a. Start Date:  \* b. End Date:

**18. Estimated Funding (\$):**

* a. Federal	<input type="text" value="13,060,895.00"/>
* b. Applicant	<input type="text" value="0.00"/>
* c. State	<input type="text" value="0.00"/>
* d. Local	<input type="text" value="0.00"/>
* e. Other	<input type="text" value="0.00"/>
* f. Program Income	<input type="text" value="0.00"/>
* g. TOTAL	<input type="text"/>

**\* 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**  
 a. This application was made available to the State under the Executive Order 12372 Process for review on .  
 b. Program is subject to E.O. 12372 but has not been selected by the State for review.  
 c. Program is not covered by E.O. 12372.

**\* 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**  
 Yes  No  
If "Yes", provide explanation and attach

**21. \*By signing this application, I certify (1) to the statements contained in the list of certifications\*\* and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances\*\* and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**  
 \*\* I AGREE  
\*\* The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

**Authorized Representative:**  
Prefix:  \* First Name:   
Middle Name:   
\* Last Name:   
Suffix:   
\* Title:   
\* Telephone Number:  Fax Number:   
\* Email:   
\* Signature of Authorized Representative:  \* Date Signed:

## Public Participation Summary

Fort Bend County's Hurricane Harvey Infrastructure Project: Big Creek Expansion Project process involved one public notice and one public meeting. The dates of the public notice, meeting and other participation opportunities are listed below.

Public Meeting Notice in Newspaper	January 31, 2019
Emails to Mailing List	February 5, 2019
Beginning of thirty day comment period	February 4, 2019
Fort Bend Connect Meeting/Announcement	February 8, 2019
Public Meeting	February 21, 2019
End of thirty day comment period	March 5, 2019
Commissioners Court approval	May 14, 2019

The thirty day public comment period for the draft of the Hurricane Harvey Infrastructure Project: Big Creek Expansion Project Application started on February 4, 2019 and ended on March 5, 2019.

A public notice was published on January 31, 2019 in the local newspaper. In addition, over eighty emails were sent to persons, organizations, and local governments on the FBC Community Development mailing list.

A FBC Community Development Department (FBCCDD) Staff member attended the February 8, 2019 Fort Bend Connect Meeting. Fort Bend Connect is networking group of individuals, groups, agencies, or organizations that strive to address the multiple needs in Fort Bend County. The monthly meetings are planned to provide valuable information regarding resources available to benefit the Fort Bend community. A copy of the public notice was posted on the announcement board; FBCCDD staff made an announcement during the meeting and handed out over twenty copies of the public notice to interested persons. Staff answered questions from persons wanting more information.

No written comments nor telephone inquiries were received during the public commenting period related to this project. No one attended the February 21, 2019 meeting.

The Hurricane Harvey Infrastructure Project: Big Creek Expansion Project Application is scheduled to be approved by Fort Bend County Commissioners Court on Tuesday, May 28, 2019. Any comments received during the public comment regarding agenda and announcement portion of the Commissioners meeting will be included in this section.

PUBLISHER'S AFFIDAVIT

Public Notice

THE STATE OF TEXAS §
COUNTY OF FORT BEND §

Before me, the undersigned authority, on this day personally appeared Lee Hartman who being by me duly sworn, deposes and says that he is the Publisher of Fort Bend Herald and that said newspaper meets the requirements of Section 2051.044 of the Texas Government Code, to wit:

- 1. it devotes not less than twenty-five percent (25%) of its total column lineage to general interest items;
2. it is published at least once each week;
3. it is entered as second-class postal matter in the county where it is published; and
4. it has been published regularly and continuously since 1959.
5. it is generally circulated within Fort Bend County.

(CLIPPING) (S)
ON Back

Publisher further deposes and says that the attached notice was published in said newspaper on the following date(s) to wit:

1-31

, A.D. 2019

[Handwritten Signature]

Lee Hartman
Publisher

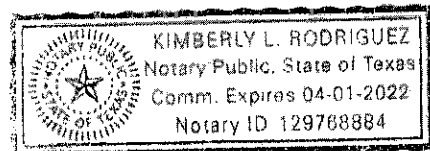
SUBSCRIBED AND SWORN BEFORE ME by Lee Hartman, who

X a) is personally known to me, or

b) provided the following evidence to establish his/her identity,

on this the 1 day of February, A.D. 2019 to certify which witness my hand and seal of office.

[Handwritten Signature]
Notary Public, State of Texas



## 930 Legal Notices

### REQUEST FOR COMPETITIVE SEALED PROPOSAL

Katy ISD Maintenance and Operations is accepting Competitive Sealed Proposals for the 2019 Campus Life Safety and Specialty System Upgrades by the "Proposal Due Date" of Thursday, February 28, 2019 at 2:00 p.m. Proposals will be received at Katy ISD's facility at 20400 Frenz Road, Katy, TX 77449. A Pre-Proposal Conference will be held February 1, 2019, 9:00 AM, at the above location. Pre-qualification requirements and proposal documents may be obtained from Selas-O'Brien Engineers, Inc., 10930 W. Sam Houston Pkwy. N., Suite 900, Houston, TX 77064 (281) 664-1900. Proposal Evaluation Criteria are published in the "INSTRUCTIONS TO PROPOSERS" section of the proposal documents. Katy ISD reserves the right to postpone or accept or reject any or all requests for proposals as it deems to be in its best interest and to waive formalities and reasonable irregularities in this proposal.

**There is more \$\$\$ in that old furniture, clothes or knick-knack than you thought. Sell them in a garage sale, by listing it in the Fort Bend Herald Classifieds at 281-232-3737.**

**NEED A classified! Call 281-232-3737.**

## 705 Unfurnished Apartment

**BAYOUBEND APARTMENTS**  
*Rosenberg's Best Kept Secret*  
**REDUCED RATE**  
 2x1 \$945-\$955 & 1/2 OFF 1st Months Rent  
 Washer & Dryer Included - Reserved Parking Included  
 Upon Credit Approval. With this ad.  
**2901 AIRPORT AVE. ROSENBERG**  
**281-342-5990**

## 930 Legal Notices

FORT BEND ISD, in accordance Texas Education Code 44.031, Texas Government Code 2254, and Texas Government Code 2269, is soliciting prospective bids RFP Supplemental Professional Learning Consulting Services RFP 19-064MC. Submissions will be due 02/26/2019 @ 2:00 P.M. CST. **NO LATE BIDS WILL BE ACCEPTED.** Contact: Maria Castellanos via email at maria.castellanos@fortbendisd.com. Bid may be downloaded from: <http://purchasing.fortbendisd.com/CurrentBids.aspx>. Mail response in a sealed envelope with RFP # on outside to: FBIISD, 555 Julie Rivers Drive, Sugar Land, TX 77478, ATTN: Maria Castellanos. RFP 19-064MC

**SUBSCRIBE TODAY!**

Fort Bend ISD, in accordance Texas Education Code 44.031, Texas Government Code 2254, and Texas Government Code 2269, is soliciting prospective bids RFP Supplemental Instructional Resources for K-12: ELA, Math, Science, Social Studies, World Languages, Health, Physical Education, Stem, Coding, Robotics RFP 19-066MC. Submissions will be due 02/26/2019 @ 3:00 P.M. CST. **NO LATE BIDS WILL BE ACCEPTED.** Contact: Maria Castellanos via email at maria.castellanos@fortbendisd.com. Bid may be downloaded from: <http://purchasing.fortbendisd.com/CurrentBids.aspx>. Mail response in a sealed envelope with RFP # on outside to: FBIISD, 555 Julie Rivers Drive, Sugar Land, TX 77478, ATTN: Maria Castellanos. RFP 19-066MC

## 930 Legal Notices

**PUBLIC NOTICE**  
**FORT BEND COUNTY, TEXAS**  
**COMMUNITY DEVELOPMENT BLOCK GRANT DISASTER RECOVERY (CDBG-DR 4332)**  
**Hurricane Harvey Infrastructure Application and Hurricane Harvey Local Buyout and Acquisition Program Application**

In February of 2018, the federal government allocated Community Development Block Grant disaster recovery (CDBG-DR) funds for the purpose of assisting in long-term recovery from 2017 disasters. The U.S. Department of Housing and Urban Development (HUD) was authorized under this Act to distribute the funds to state grantees. The State of Texas was required to submit a plan detailing the proposed use of all funds, including the criteria for eligibility and how the use of these funds will address long-term recovery and restoration of infrastructure, housing, and economic revitalization in the most impacted and distressed area. Within the State of Texas, these funds were distributed based on Methods of Distribution (MOD) developed by the Regional Councils of Government. The Houston-Galveston Area Council (H-GAC) is responsible for administering the hurricane recovery programs and guiding long-term and short-term resilience efforts in the 19-county Gulf Coast Planning Region that includes Fort Bend County. H-GAC developed a state-approved MOD for approximately \$241 million in CDBG-DR funds. Under this MOD, Fort Bend County was allocated \$21,155,575 for a Local Buyout and Acquisition Program and \$17,417,192 for a Local Infrastructure Program.

The Fort Bend County's draft Local Buyout Program and Infrastructure applications include the proposed projects to be funded using CDBG-DR Program funds and will be available for public review and comment from Monday, February 4, 2019 to Tuesday, March 5, 2019. A public meeting will be held on Thursday, February 21, 2019, at 10:00 a.m., at the William B. Travis Building, 301 Jackson St., 7th Floor Meeting Room, Richmond, Texas to receive comments from the public regarding the Hurricane Harvey Infrastructure Application and Hurricane Harvey Local Buyout and Acquisition Program Applications. The public is encouraged to attend and to submit comments to Marilyn Kindell, Community Development Director, at the Fort Bend County Community Development Department, 301 Jackson St., Suite 602, Richmond, Texas, 77469. Comments will be incorporated into the draft application documents, as appropriate.

Persons with vision or hearing impairments or other individuals with disabilities requiring auxiliary aids and services may contact the department at (281) 341-4410 regarding reasonable accommodations for the meeting. This venue is accessible for persons with physical disabilities. Spanish language translators are available at the meeting for persons with Limited English Proficiency. Persons requiring other language translators must contact the department at least 48 hours prior to the meeting at (281) 341-4410 to request translation services for the meeting.

Have the following you call t description of the ty time and date, teleph

Our customer serv you p

Call Fort I

281-

1-31

**RESOLUTION**

**Fort Bend County Community Development**

**Application to the Texas General Land Office for  
Community Development Block Grant – Disaster Recovery Assistance**

**WHEREAS**, the County Court of Commissioners finds it in the best interest of the citizens of Fort Bend County to participate in the infrastructure program through the Texas General Land Office for Community Development Block Grant – Disaster Recovery assistance regarding infrastructure affected by flooding in 2017; and

**WHEREAS**, an application must be submitted to the Texas General Land Office to participate in such program, and

**WHEREAS**, the County Court of Commissioners designates KP George, Fort Bend County Judge, as Fort Bend County's authorized official with the power to apply, reject, alter or terminate the grant on behalf of Fort Bend County.

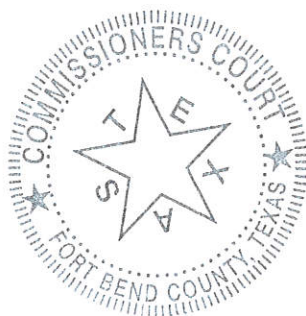
**NOW THEREFORE, BE IT RESOLVED** that the County Court of Commissioners approves submission of the grant application listed above by the Fort Bend County Judge to the Texas General Land Office.

Passed, Approved and Resolved on the 28th day of May, 2019.

  
\_\_\_\_\_  
KP George, County Judge

ATTEST:

  
\_\_\_\_\_  
Laura Richard, County Clerk





## Maps

### 1. Big Creek Expansion Project – Project Map

- This map shows the location and scope of the project. Also on this map is the latitude and longitude in decimal degrees for the center point of the project as well as the lat/long for the beginning and end points of the project.

### 2. Big Creek Project Overview – All Phases

- This map shows all phases of the expansion and excavation of Big Creek. Fort Bend County has complete over 20 miles of expansion and excavation from the Brazos River up to FM 2977. This last phase (segment 5) is the project listed in this application.

### 3. Project Beneficiary Maps

- PL 94-171 County Block Map (2010 Census): Fort Bend County, TX – CDBGUOGID 489157\_048
- 2010 Census – Census Block Map: Pleak Village, TX – Place 58088

### 4. Floodplain (FIRM) Maps

- FIRM Map – Fort Bend County
- FIRM Map – Big Creek from FM 2977 to Spur 10
- FIRMETTE – Big Creek at Pleak

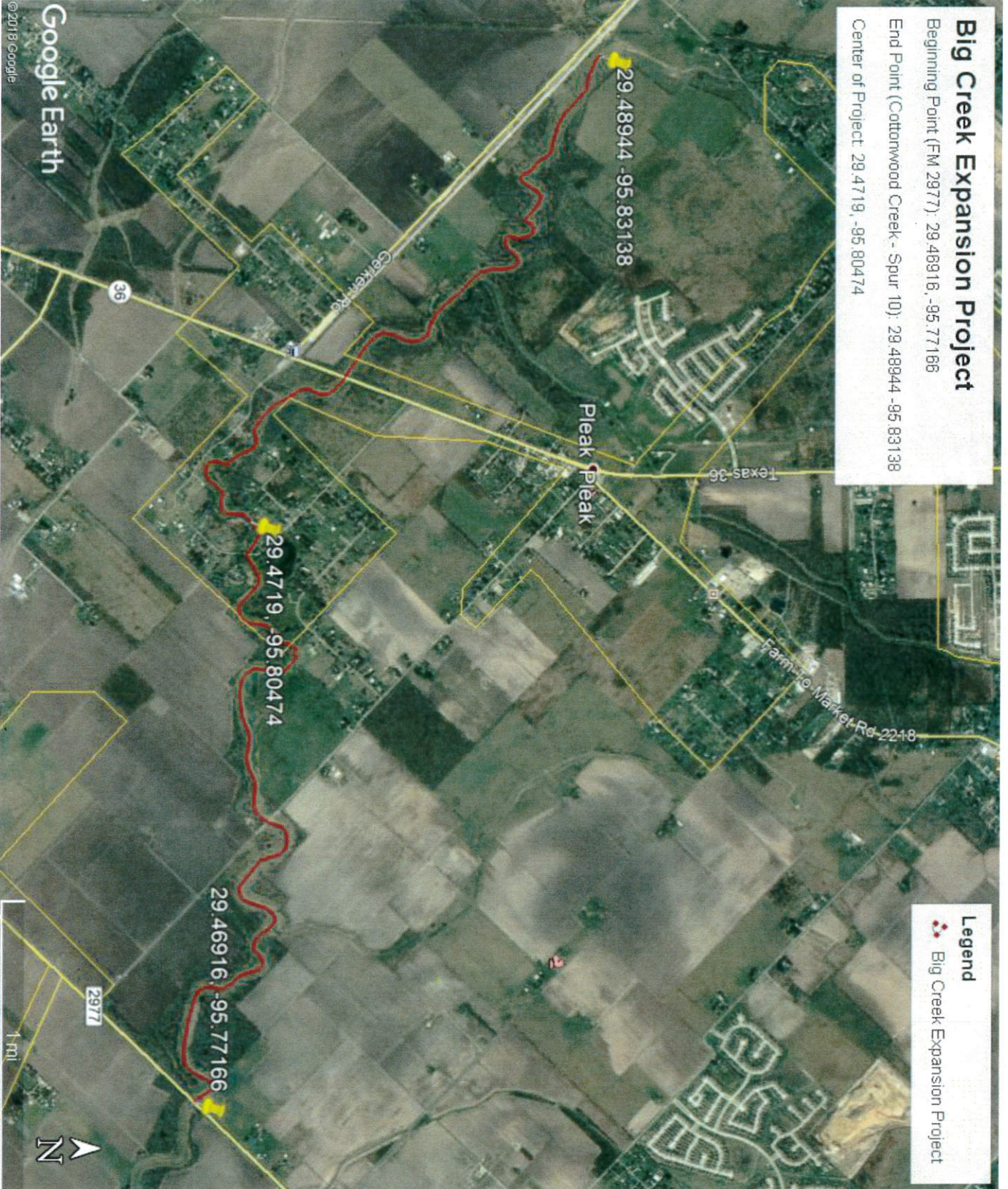
# Big Creek Expansion Project

Beginning Point (FM 2977): 29.48918, -95.77166

End Point (Cottonwood Creek - Spur 10): 29.48944, -95.83138

Center of Project: 29.4719, -95.80474

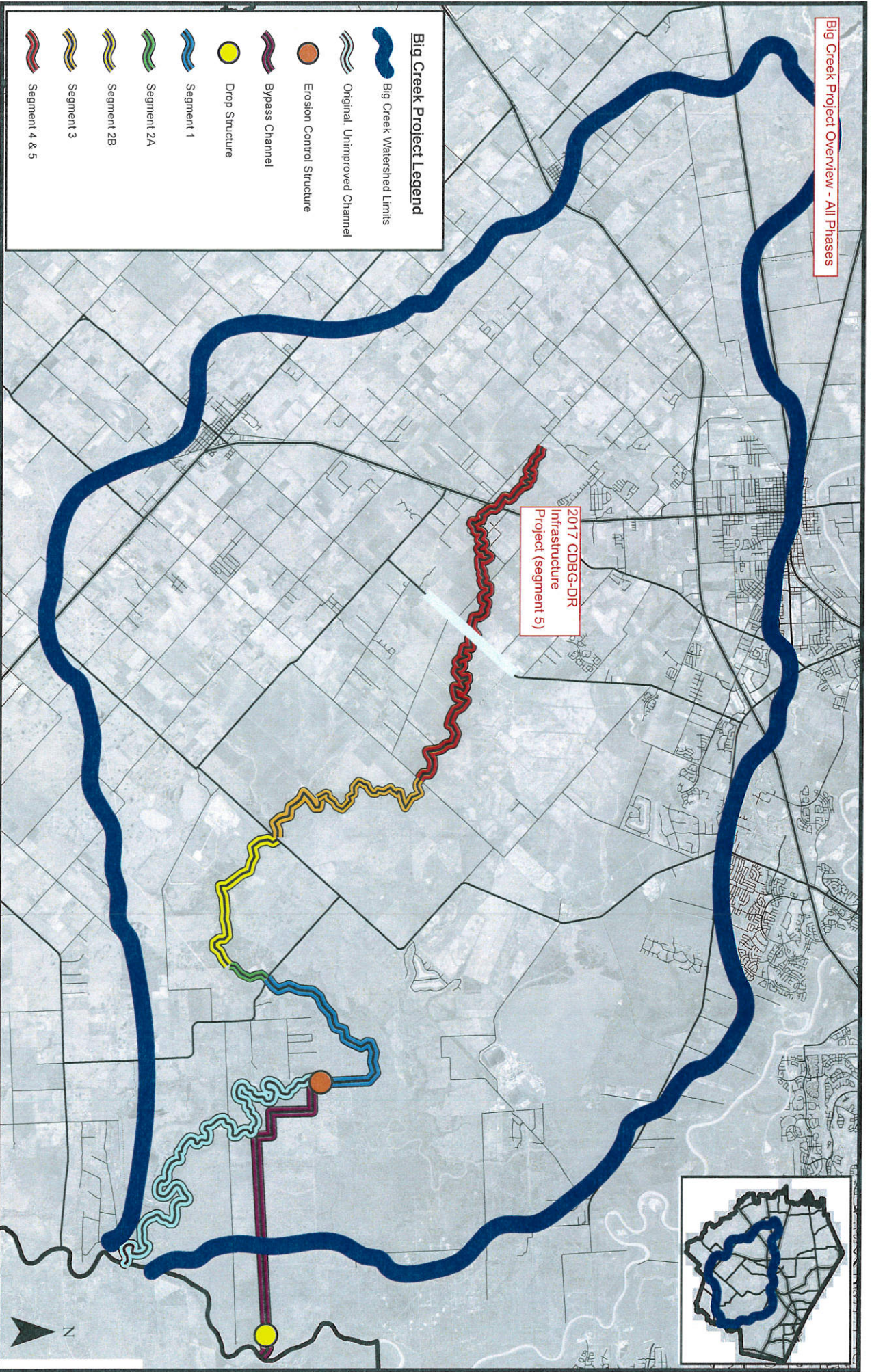
**Legend**  
Big Creek Expansion Project



Google Earth

© 2018 Google

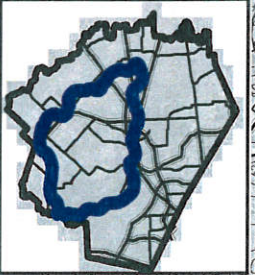
Big Creek Project Overview - All Phases



Big Creek Project Legend

- Big Creek Watershed Limits
- Original, Unimproved Channel
- Erosion Control Structure
- Bypass Channel
- Drop Structure
- Segment 1
- Segment 2A
- Segment 2B
- Segment 3
- Segment 4 & 5

2017 CDBG-DR  
Infrastructure  
Project (segment 5)



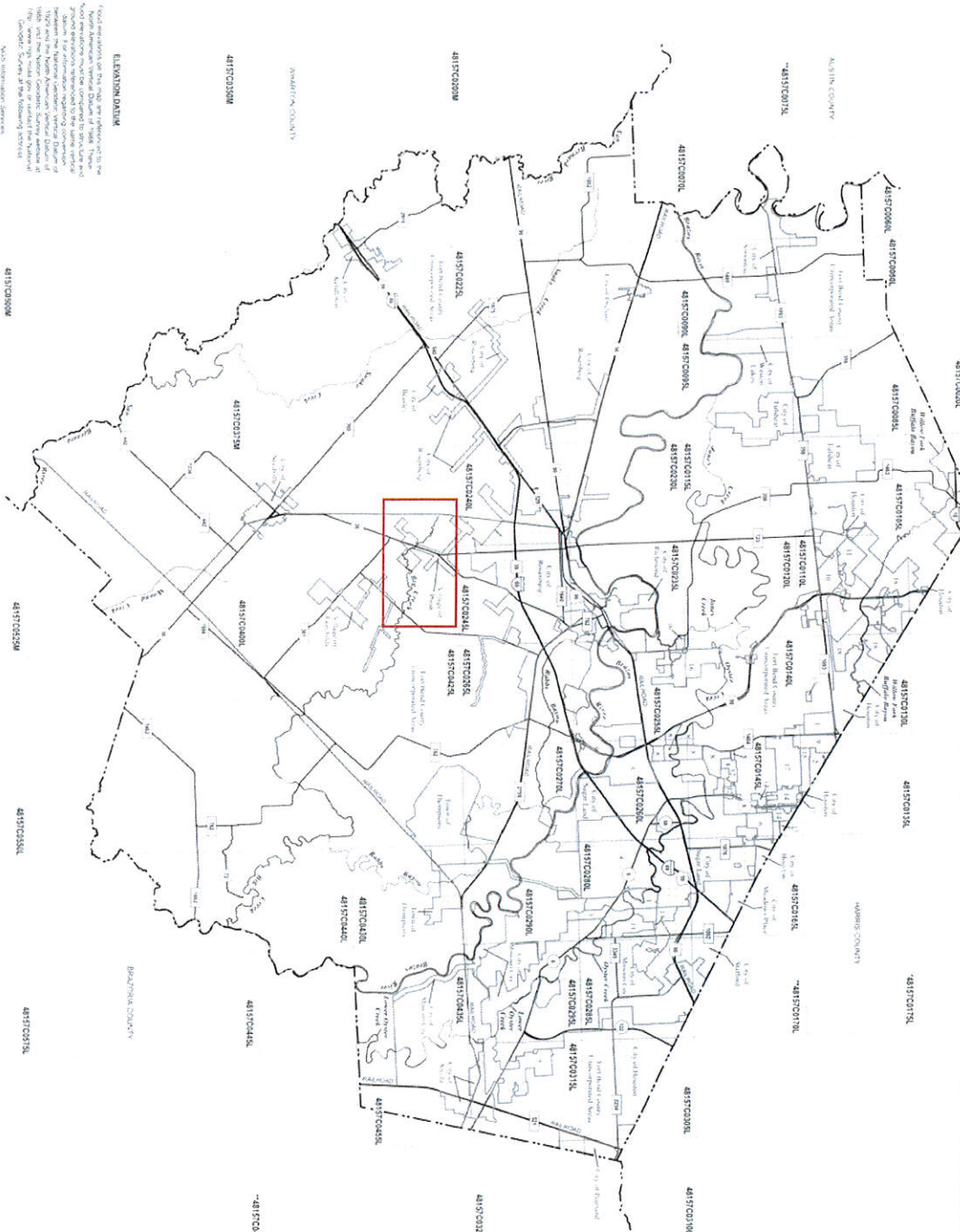




Panel	Effective Date	Panel	Effective Date	Panel	Effective Date	Panel	Effective Date
481STC0001	April 2, 2014	481STC0100	April 2, 2014	481STC0200	April 2, 2014	481STC0300	April 2, 2014
481STC0002	April 2, 2014	481STC0101	April 2, 2014	481STC0201	April 2, 2014	481STC0301	April 2, 2014
481STC0003	April 2, 2014	481STC0102	April 2, 2014	481STC0202	April 2, 2014	481STC0302	April 2, 2014
481STC0004	April 2, 2014	481STC0103	April 2, 2014	481STC0203	April 2, 2014	481STC0303	April 2, 2014
481STC0005	April 2, 2014	481STC0104	April 2, 2014	481STC0204	April 2, 2014	481STC0304	April 2, 2014
481STC0006	April 2, 2014	481STC0105	April 2, 2014	481STC0205	April 2, 2014	481STC0305	April 2, 2014
481STC0007	April 2, 2014	481STC0106	April 2, 2014	481STC0206	April 2, 2014	481STC0306	April 2, 2014
481STC0008	April 2, 2014	481STC0107	April 2, 2014	481STC0207	April 2, 2014	481STC0307	April 2, 2014
481STC0009	April 2, 2014	481STC0108	April 2, 2014	481STC0208	April 2, 2014	481STC0308	April 2, 2014
481STC0010	April 2, 2014	481STC0109	April 2, 2014	481STC0209	April 2, 2014	481STC0309	April 2, 2014

FIRM Panel Data for Printed Panels of Fort Bend County, TX and Incorporated Areas

Panel	Effective Date	Panel	Effective Date	Panel	Effective Date	Panel	Effective Date
481STC0011	April 2, 2014	481STC0110	April 2, 2014	481STC0210	April 2, 2014	481STC0310	April 2, 2014
481STC0012	April 2, 2014	481STC0111	April 2, 2014	481STC0211	April 2, 2014	481STC0311	April 2, 2014
481STC0013	April 2, 2014	481STC0112	April 2, 2014	481STC0212	April 2, 2014	481STC0312	April 2, 2014
481STC0014	April 2, 2014	481STC0113	April 2, 2014	481STC0213	April 2, 2014	481STC0313	April 2, 2014
481STC0015	April 2, 2014	481STC0114	April 2, 2014	481STC0214	April 2, 2014	481STC0314	April 2, 2014
481STC0016	April 2, 2014	481STC0115	April 2, 2014	481STC0215	April 2, 2014	481STC0315	April 2, 2014
481STC0017	April 2, 2014	481STC0116	April 2, 2014	481STC0216	April 2, 2014	481STC0316	April 2, 2014
481STC0018	April 2, 2014	481STC0117	April 2, 2014	481STC0217	April 2, 2014	481STC0317	April 2, 2014
481STC0019	April 2, 2014	481STC0118	April 2, 2014	481STC0218	April 2, 2014	481STC0318	April 2, 2014
481STC0020	April 2, 2014	481STC0119	April 2, 2014	481STC0219	April 2, 2014	481STC0319	April 2, 2014



**ELEVATION DATUM**  
 Elevation information on this map is referenced to the North American Vertical Datum of 1988. These elevations are based on the mean sea level of the Gulf of Mexico. For more information regarding this datum, please refer to the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:  
 National Geodetic Survey  
 1115 North West Second Street  
 Galveston, TX 77550-1199  
 (409) 742-2222

**MAP INDEX**  
 This index map shows the location of the FIRM panels in the Fort Bend County, Texas. The FIRM panels are shown in a grid pattern. The map index is printed on a separate sheet. For more information regarding this map index, please refer to the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:  
 National Geodetic Survey  
 1115 North West Second Street  
 Galveston, TX 77550-1199  
 (409) 742-2222

**MAP REVISIONS**  
 This map was revised on 12/21/2017. The FIRM panels were updated to reflect the most current information. For more information regarding this map revision, please refer to the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:  
 National Geodetic Survey  
 1115 North West Second Street  
 Galveston, TX 77550-1199  
 (409) 742-2222

**MAP REVISIONS**  
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 National Geodetic Survey  
 1115 North West Second Street  
 Galveston, TX 77550-1199  
 (409) 742-2222

**NATIONAL FLOOD INSURANCE PROGRAM**  
**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**FORT BEND COUNTY**  
**TEXAS**  
**AND INCORPORATED AREAS**  
**DATE LISTING OF COMMUNITIES: 12/21/2017**

**MAP INDEX**  
 PANELS PRINTED: 42, 48, 90  
 MAP NUMBER: 481STC1  
 MAP REV: 12/21/2017  
 MAP INDEX: 12/21/2017

**MAP INDEX**  
 MAP NUMBER: 481STC1  
 MAP REV: 12/21/2017  
 MAP INDEX: 12/21/2017

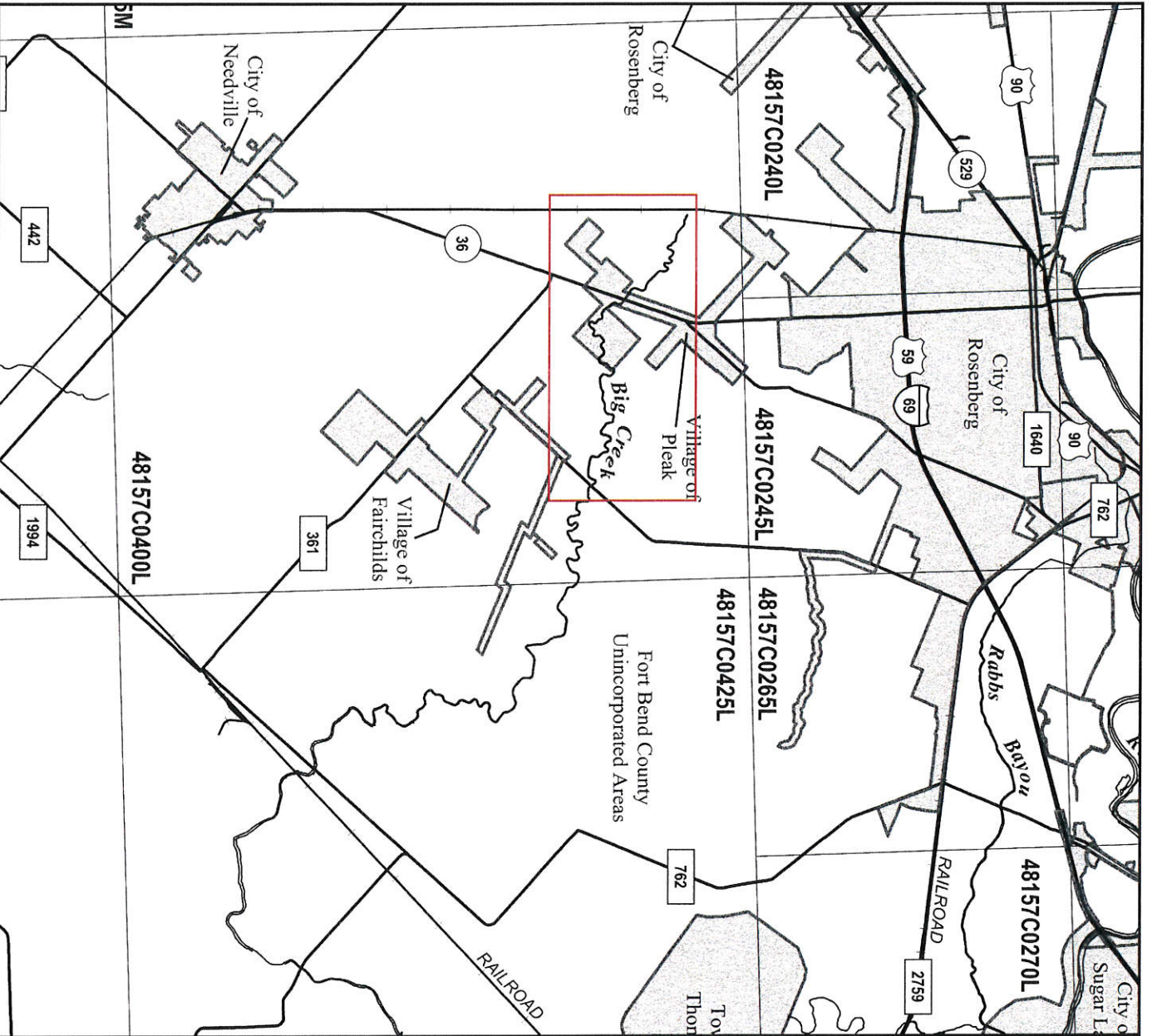
**MAP INDEX**  
 MAP NUMBER: 481STC1  
 MAP REV: 12/21/2017  
 MAP INDEX: 12/21/2017

**NATIONAL FLOOD INSURANCE PROGRAM**  
**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**FORT BEND COUNTY**  
**TEXAS**  
**AND INCORPORATED AREAS**  
**DATE LISTING OF COMMUNITIES: 12/21/2017**

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 MAP REV: 12/21/2017  
 MAP INDEX: 12/21/2017

**MAP INDEX**  
 MAP NUMBER: 481STC1  
 MAP REV: 12/21/2017  
 MAP INDEX: 12/21/2017



MAP INDEX

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**FORT BEND COUNTY,**  
**TEXAS**  
**AND INCORPORATED AREAS**  
 (SEE LISTING OF COMMUNITIES TABLE)

# MAP INDEX

**PANELS PRINTED:** 40, 45, 60, 70, 80, 85, 90, 95, 105, 110, 115, 120, 130, 135, 140, 145, 165, 200, 225, 230, 235, 240, 245, 255, 260, 265, 270, 280, 285, 290, 295, 305, 310, 315, 320, 350, 375, 400, 425, 430, 435, 440, 445, 455, 500, 525, 550, 575

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
**48157CIND08**  
**MAP REVISED**  
**DECEMBER 21, 2017**

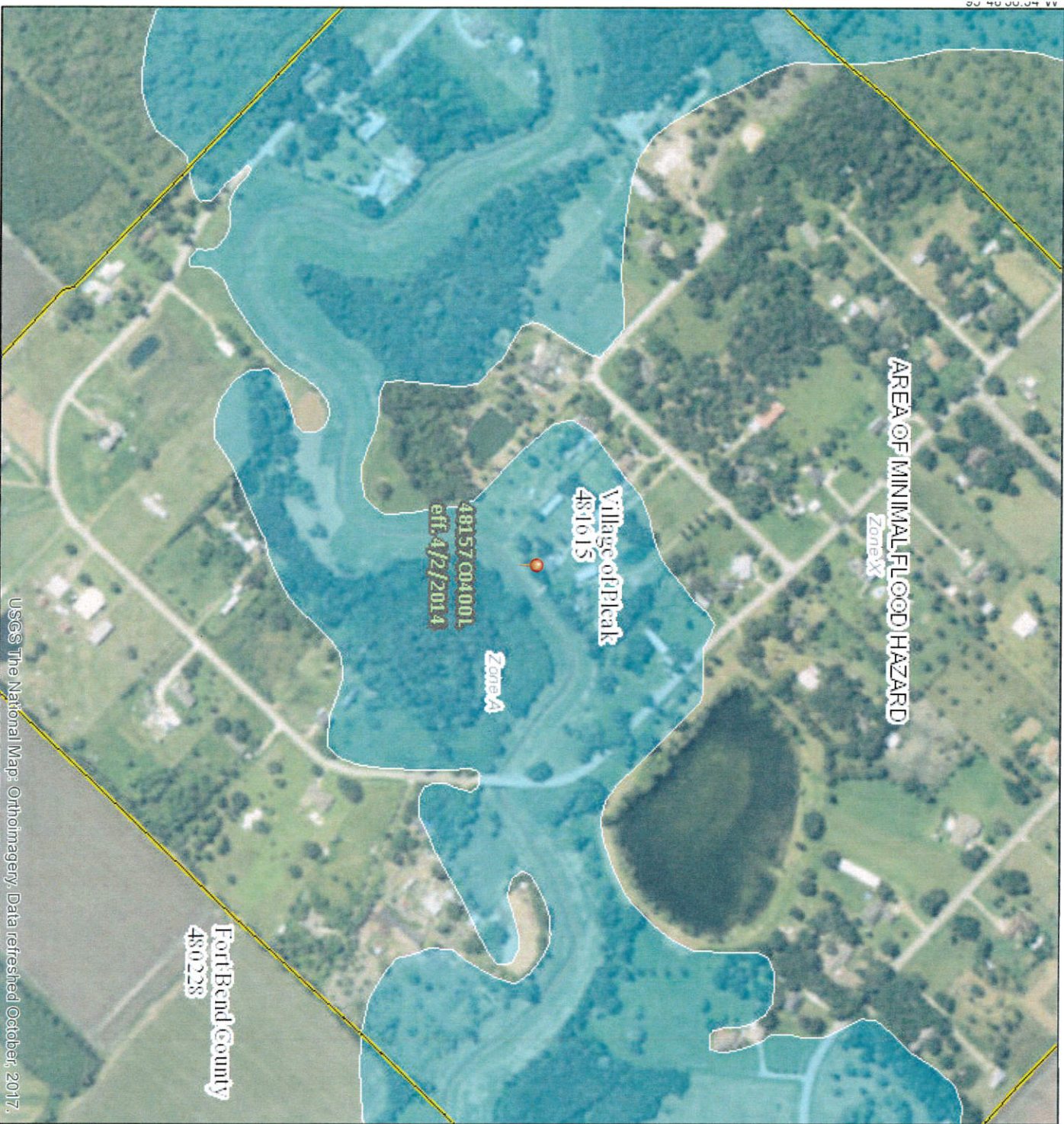


Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

# National Flood Hazard Layer FIRMette

29°28'34.89"N



## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

	Without Base Flood Elevation (BFE) Zone A, V, A99
	With BFE or Depth Zone AE, AO, AH, VE, AR Regulatory Floodway

0.2% Annual Chance Flood Hazard, Area of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile (Zone D)

Future Conditions 1% Annual Chance Flood Hazard Zone X

Area with Reduced Flood Risk due to Levee. See Notes, Zone X

Area with Flood Risk due to Levee Zone D

	Area of Minimal Flood Hazard Zone X
	Effective LOMRS
	Area of Undetermined Flood Hazard Zone

	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall

	20.2
	17.5
	Water Surface Elevation
	Coastal Transect
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature

Cross Sections with 1% Annual Chance

	Digital Data Available
	No Digital Data Available
	Unmapped

MAP PANELS

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **3/5/2019 at 7:10:18 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap Imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRN panel number, and FIRN effective date. Map Images for unmapped and unmodernized areas cannot be used for regulatory purposes.

USGS The National Map, Orthorectified, Data refreshed October, 2017.

0 250 500 1,000 1,500 2,000 Feet

1:6,000

95°47'58.88"W



## Additional Information

### Funding Information

- **FEMA Coverage**
  - Fort Bend County did not submit this project to FEMA for possible reimbursement under FEMA's Public Assistance (PA) Program. This is due to the fact that Big Creek from FM 2977 up to its confluence at Coon Creek and Cottonwood Creek (near Spur 10) sustained little direct damage to the channel itself as a result of Hurricane Harvey. That said, the limited capacity of Big Creek's channel meant that it was unable to contain the large amounts of water moving through the channel during Hurricane Harvey, causing flooding in homes, roads, and agricultural lands.
  - (Note that Fort Bend County did submit a FEMA Public Assistance Project Worksheet for damage that occurred to Big Creek further downstream.)
  - As stated in the application, this project was not submitted to the FEMA Hazard Mitigation Grant Program as this project did not meet the FEMA requirement of having a Benefit Cost Ratio of 1.1 or greater. Attached is the PowerPoint presentation (DR-4332 HMGP applicant briefing FINAL 03292018) used by the Mitigation Unit of the Texas Division of Emergency Management (TDEM) that states projects must demonstrate the 1.1 Benefit Cost Ratio (see slide 14).
- **Other Funding**
  - In the past, Fort Bend County Commissioners Court allocated funds to contribute towards the previous phases of the expansion of Big Creek. Fort Bend County has had a recent change in leadership and subsequent changes in priorities. No funds have been allocated for this project at this time.

### Project Detail

- The Fort Bend County Drainage District maintains the Big Creek channel and has existing easement along Big Creek, including through the Village of Pleak. Since the Fort Bend County Drainage District maintains the Big Creek channel, no agreement between Fort Bend County and the Village of Pleak is necessary. Instead, the Drainage District will see right-of-way entry to Big Creek from the individual property owners along Big Creek.
- The expansion and excavation of Big Creek from FM 2977 up to confluence at Cottonwood Creek and Coon Creek (near Spur 10) would provide immediate benefit the Village of Pleak, making the Village of Pleak the main service area for this project. The Village of Pleak is a Census Defined Place (Place 58088) with 64.33% LMI.



# DR-4332

## HMGP APPLICANT BRIEFING

Hazard Mitigation Section  
TDEM Recovery, Mitigation, and Standards

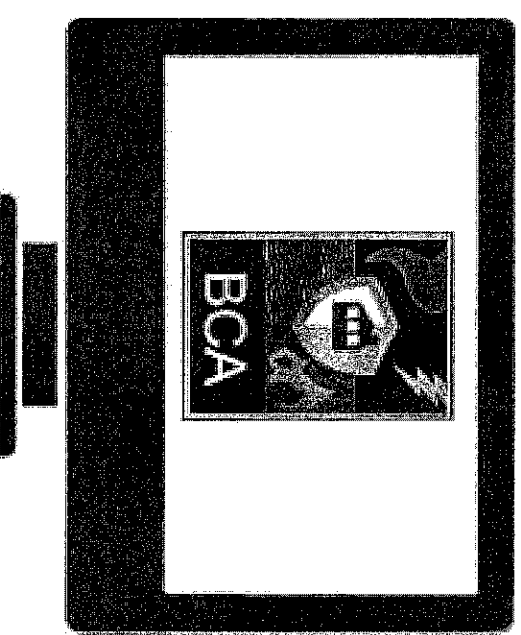


Texas Department of Public Safety

DIVISION OF EMERGENCY MANAGEMENT

# Benefit-Cost Analysis

- Projects must demonstrate a benefit-cost ratio of 1:1 or greater
- Pre-calculated benefits
  - Substantially damaged determination in SFHA
  - \$276,000 acquisitions in SFHA
  - \$175,000 elevations in SFHA
  - Hurricane wind retrofit measures



## MEMORANDUM

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**To:** Fort Bend County

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**From:** Troy Dorman  
Christy Williams  
Jonathan Smith

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**CC:** Kim Truong  
Jenn Lenart

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**Date:** 8/21/2018

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**Subject:** Big Creek Expansion Project  
BCA Results

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### 1.0 INTRODUCTION

The Big Creek Expansion Project is located about five miles south of Rosenberg, Texas. This project proposes widening the creek from its intersection with FM 2977 to its confluence with Cottonwood Creek and Coon Creek. The excavation of this portion of the creek marks the last 18% (and furthest upstream) of the planned creek improvements in a multi-phase project. An initial screening of the benefits received in this project area indicate that the widening of the channel and addition of weirs will:

- Increase the channel's capacity to convey a 10-year frequency rainfall event as well as reduce its floodplain levels; and
- Reduce the probability of structural and roadway flooding within the watershed.

The analysts compared the estimated construction costs of this final phase of the Big Creek Expansion project (i.e., \$13,615,531) to the benefits anticipated from the modeled flood reductions. The BCA (Benefit Cost Analysis) indicated that the benefits received from the proposed final phase are not significant enough to obtain a Benefit Cost Ratio (BCR) that is greater than 1.0 – required to be eligible to receive FEMA Hazard Mitigation Grant Program funding. After testing multiple scenarios, the analysts concluded that the BCR would be a maximum of **0.09**. The analysis indicates that the likely cause for this low score is that previous phases of the project have already maximized ultimate benefits.

Section 2 of this memorandum addresses the BCA screening inputs. The final BCA inputs are summarized in Appendix A.

## 2.1 ADJUSTMENTS TO RI

The Tetra Tech team conducted an analysis of the return intervals determined by the HEC-RAS models developed by AECOM and Dodson & Associates. This analysis was done to ensure the return intervals of the modeled flows were being represented based on the best available data. Using USGS gage data and USGS flood frequency analysis program, Peak FQ, the team found that the modeled flows have a lower return interval than previously presented and have been mischaracterized. The analytical team made adjustments to the original RIs for the modeled events to reflect the findings of the analysis (Table 1). While this discovery did not change the overall outcome of the BCA screening, it was critical when determining the overall benefits calculated by FEMA's BCA tool (Attachment A). Lower RIs result in greater benefits due to a higher likelihood of damaging storms which could be eliminated by a proposed project.

**Table 1.** AECOM and Dodson & Associates modeled return intervals versus the USGS Peak FQ (flood-frequency) analysis of streamflow records.

Modeled RI (years)	Modeled Flow (cfs)	Peak FQ RI (years)
<b>AECOM Cross Section 85570.08</b>		
10	4,167	4.8
25	5,395	8.5
50	6,376	13.6
100	7,416	22.4
500	10,046	78.7

## 2.2 STRUCTURAL ASSETS

The key limitation that the Tetra Tech analysts identified in the structural damages is that there are more outbuilding structures affected within the project area than residential structures (Table 2). For example, in the 100-year floodplain, 25 residential structures are flooded pre-mitigation compared to 53 outbuilding structures. This affects the expected damages seen on the site because outbuildings have a smaller replacement cost compared to residential structures (i.e., \$199,732 vs \$2,183,818 respectively).

**Table 2.** Example of Total Damages to Residential Structures and Outbuildings Pre-Mitigation.

Return Interval	Total Damages to Residential Buildings Pre-Mitigation	Total Damages to Outbuildings Pre-Mitigation
4.8	\$550,962	\$39,511
8.5	\$879,756	\$85,476
13.6	\$1,348,070	\$143,152
22.4	\$2,183,818	\$199,732
78.7	\$5,343,751	\$423,319

With only structural assets, the BCR was calculated at **0.06**.

## Appendix A. BCA Input

### 1.0 BCA DATA DOCUMENTATION

The analysis was performed by Jenn Lenart of Tetra Tech, Inc. under contract with Fort Bend County, TX. The damage frequency module of BCAR version 5.3.0 was utilized for this analysis. While there was data available to support the use of the full-data flood model, the sheer number of structures impacted by this project dictated use of the damage frequency module with data generated outside of BCAR version 5.3. This memorandum has been prepared to explain and document those BCAR data entries that require an explanation and citation of data source and act as a guide for the technical review of this benefit-cost analysis.

#### 1.1 HAZARD AND MITIGATION DATA

The hazard type selected for this assessment was flood and the mitigation type selected was floodwater diversion and storage. The basis for the damages was expected damages.

#### 1.2 COST ESTIMATION INFORMATION

The overall costs reflect current 2018 average low bids for the state of Texas. A breakdown of these prices has been provided by the project engineers.

##### 1.2.1 Project Useful Life

The analyst utilized a project useful life of 35-years for this project. FEMA Guidance provides recommendations for major drainage systems and localized flood reduction projects at a range from 35 to 100 years for drainage improvement projects. Since there was not a project useful life suggested by the project engineers, the FEMA standard value of 35-years was chosen considering these suggestions and a lower bound analysis.

##### 1.2.2 Mitigation Project Costs

A detailed project cost was developed and utilized during the BCA (Attachment B).

##### 1.2.3 Annual Maintenance Cost

According to Fort Bend County and the Project Design Engineer, this project will require little or no post maintenance. However, to support the concept of a lower bound analysis, the analyst included a value of \$1,000/year under the assumption that county and city staff will need to monitor the project area periodically during high flow events to confirm the project's functionality. This \$1,000 was based on an estimate of 25 hours at \$40/hour.

### 3.2 DISPLACEMENT COSTS

In part two of this assessment, the analyst used displacement costs that occurred in this project area. These values were determined using FEMA’s Full-data Flood Module displacement depth damage function (Figure 3). Under FEMA’s BCA Flood Module, the current costs for federal lodging per diem is \$91 per person and the current costs for federal meals per diem is \$51.

**Figure 3.** Screen grab from FEMA’s BCA Flood Module to determine the trendline for displacement costs.

PROJECT: Full Data test, STRUCTURE: 401 Starview Dr, Darville  
MITIGATION TYPE: Flood - Drainage Improvement

STRUCTURE BCR: 0.00

Save and Go Back Save and Continue

Residential Structure Information

Depth Damage Function Type \*  
 Default  Library  Custom

Select Depth Damage Function (DDF) \*  
 USACE Generic

Residential displacement  
 Current federal lodging per diem\* \$91  
 Current federal meals per diem\* \$51  
 Population affected\*   
 Cost per person to eat meals at home \$7  
 Displacement Cost \$ 0.00

Building Contents  
 Default (100% BRV) \$ 375,000.00  
 OR  
 User-entered (\$) \$ 0.00

Loss of Rent  
 Rent (\$/month) \$ 0.00

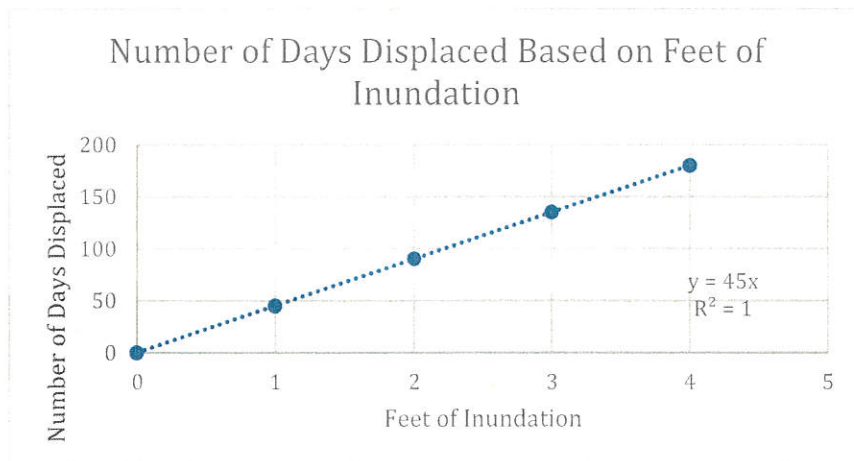
Utilities that are not elevated  NFIP  
 Utilities or other contents in the crawlspace (if any) \$ 0.00

Depth Damage Functions \*

Flood Depth (ft)	Before Mitigation (Days)	Before Mitigation (\$)	After Mitigation (Days)	After Mitigation (\$)
0.0	0.0	\$0	0.0	\$0
1.0	45.0	\$0	45.0	\$0
2.0	90.0	\$0	90.0	\$0
3.0	135.0	\$0	135.0	\$0
4.0	180.0	\$0	180.0	\$0

Using the flood depth curve, the analyst created a trendline that would determine the number of days pre-mitigation that residents would be displaced (Figure 4).

**Figure 4.** The trendline used to determine the number of days residents would be displaced during flood events depending on the feet of inundation for homes in the project area.



The depth of inundation as determined by the GIS analysis generated the number of days residents were displaced during a 10-, 50-, 100-, and 500-year flood event in the project area. The number of days displaced was multiplied against Fort Bend County’s average persons per household (i.e., 3.17) and cost

8/21/2018



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**To:** Fort Bend County

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**From:** Troy Dorman, Peter Cada, Christy Williams, Jamie Childers, Ruben Martinez, Kim Truong, Jenn Lenart -- Tetra Tech

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**Date:** Friday, July 27, 2018

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**Subject:** Big Creek Channel Expansion Project – Frequency Analysis

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The following memorandum discusses the frequency analysis performed on stream flows modeled by AECOM and Dodson & Associates using gage data from USGS gage 08115000 in Big Creek at Trinity Road and the USGS PeakFQ program.

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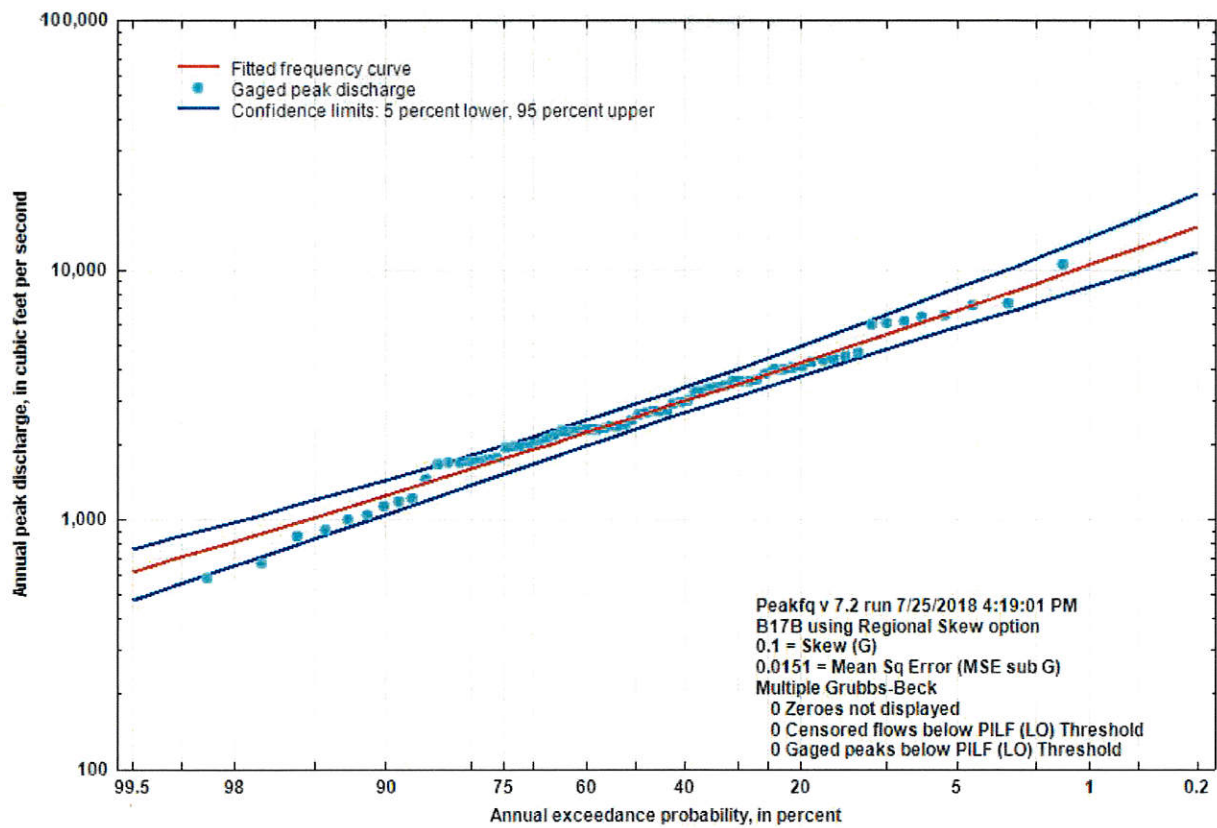


Figure 2. Peak FQ fitted frequency curve of peak flow rates at USGS gage 08115000

Table 1. Peak FQ estimated annual exceedance probability and return intervals for flow rates at USGS gage 08115000

Annual Exceedance Probability (AEP) (%)	Return Interval (RI) (years)	Flow (cfs)
99.5	1.01	612.3
99	1.01	699.3
98	1.02	809.7
97.5	1.03	851.9
96	1.04	954.6
95	1.05	1012
90	1.11	1236
80	1.25	1581
70	1.43	1892
66.7	1.50	1995
60	1.67	2209
57.0	1.75	2308

cross section geometries. Flow rates and return intervals were analyzed using the USGS gage 08115000 flow duration curve for model cross section 85570.08, which corresponds to the USGS gage location. Using Peak FQ data, AEP and return intervals (RI) for the AECOM modeled flows were calculated to be much more frequent than presented in the model (Table 2). A 10-year return interval flow of 4,167 cfs was determined to be closer to a 5-year return interval. Similarly by this analysis, a flow of 10,046 cfs, which was considered a 500-year event in the AECOM model, was calculated to be closer to an 80-year event.

Table 2. AECOM post-project peak flow return intervals

AECOM RI (years)	AECOM AEP (%)	AECOM Q Total (cfs)	Peak FQ AEP (%)	Peak FQ RI (years)
10	10	4,167	21.0	4.8
25	4	5,395	11.7	8.5
50	2	6,376	7.3	13.6
100	1	7,416	4.5	22.4
500	0.2	10,046	1.3	78.7

## 2.2. Dodson & Associates

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In 2003 Dodson & Associates developed a similar HEC-RAS model for the Big Creek Channel Improvement Project and modeled post-project peak flow rates at multiple locations along Big Creek (Table 3). USGS gage 08115000 is located in between two of the modeled locations, Below Seabourne Creek Confluence and Below Unnamed Tributary #1 (Figure 1). The peak flow for both locations were analyzed using the Peak FQ flow duration curve. Calculated return intervals for the location below Seabourne Creek ranged from 2.4 years to 12.9 years for the same flow rates that were considered to be 5- and 100-year events in the Dodson & Associates model (Table 4). The 5-year and 100-year events at the location below Unnamed Tributary #1 were determined to be closer to 4- and 19-year events when compared to Peak FQ data for the same 3,540 cfs and 7,045 cfs flow rates, respectively (Table 5).

Dodson RI (years)	Dodson AEP (%)	Dodson Peak Flow (cfs)	Peak FQ AEP (%)	Peak FQ RI (years)
5	20	3,540	28.4	3.5
10	10	4,417	18.7	5.4
25	4	5,403	11.7	8.6
100	1	7,045	5.3	18.8

### 3.0 CONCLUSION

The 20 highest peak flow rates at USGS gage 08115000 were reviewed within the context of the Peak FQ flow duration curve and are presented in Table 6 from highest to lowest peak flow. It can be seen that in the last 60 years there have been 5 events greater than Hurricane Harvey, one of which occurred in May 2015 and is the second highest on record. Hurricane Harvey, which would be considered to have a return interval between a 25-50-year by the AECOM model, is likely closer to a 12-year event. Of the 20 highest peak flows experienced at this gage, three of the events occurred in the last three years and according to the analysis have return intervals from 4-years to 20-years.

Using historical USGS gage data and USGS frequency analysis program, Peak FQ, this analysis has found that previously modeled peak flow return intervals have been mischaracterized. In both AECOM and Dodson & Associates HEC-RAS models, return intervals were presented to be longer than what was determined using Peak FQ data. This means that a peak flow rate that was characterized to have a probability of occurring only 1 time in 100 years could be more likely to occur once every 22 years. In other words, the creek will reach higher peak flow rates more frequently and pose more risk than previously presented.

Table 6. Highest 20 peak flows from available data at USGS gage 08115000 (1947-2018)

Date	Gage Peak Flow (cfs)	Peak FQ AEP (%)	Peak FQ RI (years)
6/26/1960	10,400	1.1	93.1
5/26/2015	7,250	4.8	20.7
9/20/1979	7,140	5.1	19.6
11/11/1985	6,490	6.9	14.4
8/31/1981	6,420	7.2	13.9
8/27/2017	6,160	8.1	12.3
6/19/1961	6,050	8.6	11.7
10/18/1994	6,000	8.8	11.4
10/16/2006	4,600	17.1	5.8
10/15/1957	4,500	17.9	5.6
8/18/1983	4,380	19.0	5.3
4/18/2009	4,330	19.5	5.1
6/13/1973	4,220	20.5	4.9
11/18/2003	4,050	22.2	4.5
5/30/1975	4,000	22.8	4.4
5/13/1982	3,960	23.2	4.3
11/23/2004	3,940	23.4	4.3

## ATTACHMENT B

### Project Costs





