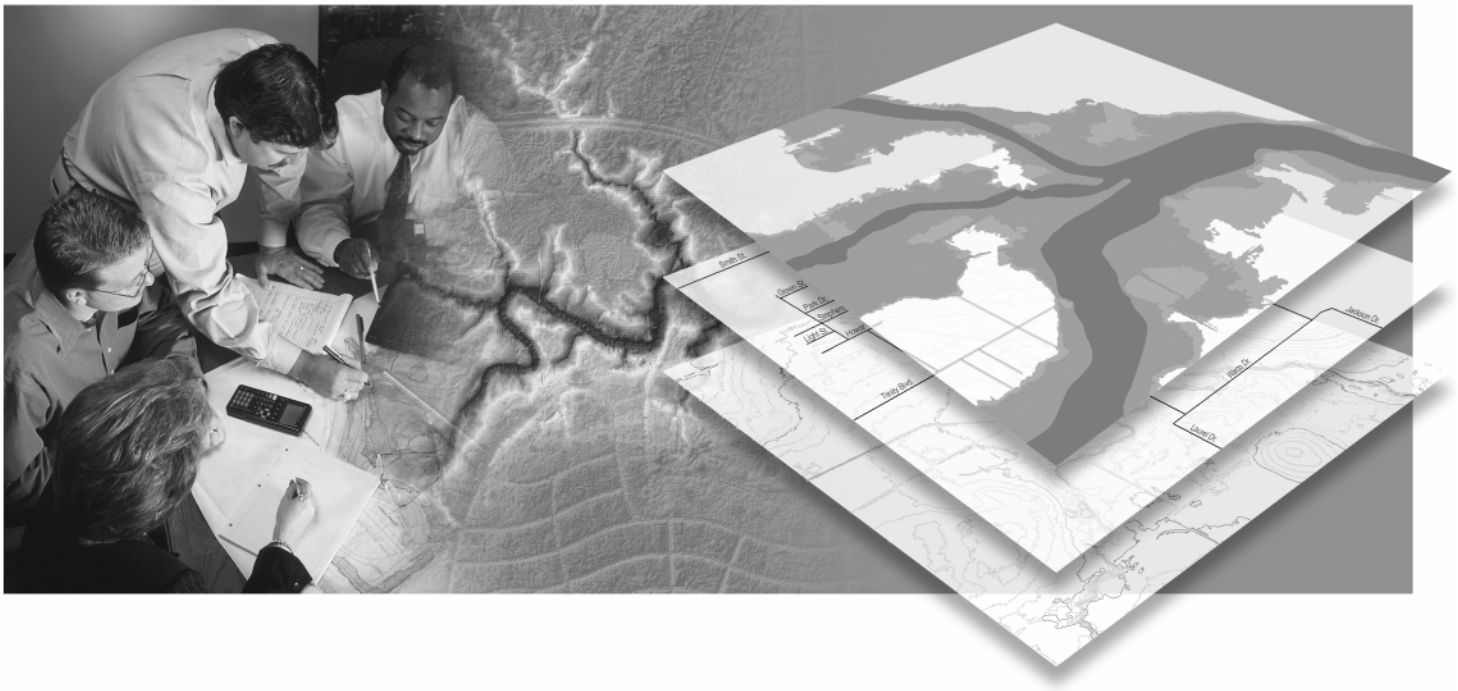
Flood Insurance Study

Harris County, Texas and Incorporated Areas

VOLUME 1 of 8



COMMUNITY NAME	COMMUNITY NO.	COMMUNITY NAME	COMMUNITY NO.
Baytown, City of	485456	Nassau Bay, City of	485491
Bellaire, City of	480289	Pasadena, City of	480307
Bunker Hill Village, City of [1]	480290	Pearland, City of	480077
Deer Park, City of	480291	Piney Point Village, City of	480308
El Lago, City of	485466	Seabrook, City of	485507
Galena Park, City of	480293	Shoreacres, City of	485510
Hedwig Village, City of[1]	480294	South Houston, City of	480311
Hilshire Village, City of	480295	Southside Place, City of	480312
Houston, City of	480296	Spring Valley, City of	480313
Humble, City of	480297	Stafford, City of	480233
Hunters Creek Village, City of	480298	Taylor Lake Village, City of	485513
Jacinto City, City of	480299	Tomball, City of	480315
Jersey Village, City of	480300	Webster, City of	485516
La Porte, City of	485487	West University Place, City of	480318
Missouri City, City of	480304	Harris County Unincorporated Areas	480287
Morgans Point, City of	480305		

[1] No Special Flood Hazard Areas identified

This Preliminary FIS report only includes revised Floodway Data tables, revised Flood Profiles, and Addendum 10.4. The unrevised Floodway Data tables, Flood Profiles, and FIS text will appear in the final FIS report.

PRELIMINARY
JULY 29, 2015

FEMA

REVISED:
FLOOD INSURANCE STUDY
NUMBER 48201CV001E

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components. A listing of Community Map Repositories can be found on the Index Map.

This FIS was revised on [TBD]. Users should refer to Section 10.0, Revision Description, for further information. Section 10.0 is intended to present the most up-to-date information for specific portions of this FIS report. Therefore, users of this FIS report should be aware that the information presented in Section 10.0 supersedes information in Sections 1.0 through 9.0 of this FIS report.

This publication incorporates revisions to the original FIS.

Initial Countywide FIS Effective Date: September 28, 1990

First Revised Countywide FIS Date: September 30, 1992 – to update corporate limits; to decrease Base Flood Elevations; to update map format and roads and road names; and to incorporate previously issued letters of map amendment.

Second Revised Countywide FIS Date: November 6, 1996 – to update corporate limits, map format and roads and road names; to decrease Base Flood Elevations; and to incorporate previously issued letters of map amendment.

Third Revised Countywide FIS Date: April 20, 2000 – to update corporate limits; to add Base Flood Elevations, Special Flood Hazard Areas; to change Base Flood Elevations, Special Flood Hazard Areas, and zone designations; to add road and road names; to reflect updated topographic information; and to incorporate previously issues letters of map revision, and previously issues letters of map amendment.

Fourth Revised Countywide FIS Date: June 18, 2007 – to change Base Flood Elevations, Special Flood Hazard Areas, zone designations, and floodway; and to reflect updated topographic information.

Fifth Revised Countywide FIS Date: October 16, 2013 – to change Base Flood Elevations, Special Flood Hazard Areas, and floodway; and to incorporate previously issued letters of map revision.

Sixth Revised Countywide FIS Date: June 9, 2014 – to change Base Flood Elevations, Special Flood Hazard Areas, and floodway; and to incorporate previously issued letters of map revision.

Seventh Revised Countywide FIS Date: May 4, 2015 – to update corporate limits.

Eighth Revised Countywide FIS Date: [TBD] – to change Base Flood Elevations, Special Flood Hazard Areas, zone designations and floodway; to incorporate previously issued letters of map revision; to reflect updated topographic information; and to update roads and road names

This Preliminary FIS report only includes revised Floodway Data tables, revised Flood Profiles, and Addendum 10.4. The unrevised Floodway Data tables, Flood Profiles, and FIS text will appear in the final FIS report.

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Table 16. Letters of Map Revision - Sixth Revision (Cont'd)

Case Number	Date Issued	Project Identifier	Revised Map Panels	Revised Floodway Data Tables	Revised Profiles
10-06-1715X	4/30/2010	Northwest Park Colony	48201C0465M	N/A	E24P
11-06-2873P	7/26/2011	Little White Oak Bayou Floodway Revision	48201C0660M	E101-00-00	N/A
12-06-1071P	5/30/2012	Buffalo Bayou	48201C0670M	N/A	W05P
12-06-3003P	3/7/2013	Tributary 34.6 to Greens Bayou	48201C0465M	N/A	N/A

Case number 07-06-1889P also includes revision to the "Summary of Discharges" table, as shown in Table 15.

10.3 Seventh Revision – May 4, 2015

This PMR revises map panels associated with the City of Baytown. The portions of the City of Baytown within Chambers County that were previously shown on the Harris County and Incorporated Areas FIRMs and FIS Report are now shown separately on the Chambers County and Incorporated Areas FIRMs and FIS Report. See the separately published countywide FIS Reports and FIRMs for NFIP applications and purposes for the City of Baytown in areas outside of Harris County.

10.4 Eighth Revision – [TBD]

This PMR is a joint effort between FEMA and its Cooperating Technical Partner (CTP), the Harris County Flood Control District (HCFCD). The CTP Agreement was established under FEMA contract No. EMT-2010-CA-0014, with Mapping Activity Statement (MAS) 16. This PMR incorporates updated hydrology and hydraulic models for approximately 59.4 stream miles that have been updated to reflect key changes in the Addicks Reservoir Watershed (HCFCD Unit # U100-00-00). These changes include approved Letters of Map Revision (LOMRs), extensive development with its associated on-site detention resulting in land use and other watershed parameter changes, and updated hydrology and hydraulics from the adjacent Cypress Creek Watershed (HCFCD Unit # K100-00-00) overflows to the Addicks Reservoir Watershed and updated floodplain boundaries for Addicks Reservoir as a result of more up-to-date topographic information. The study also incorporates changes to T101-00-00 (Mason Creek), T101-13-00 (Diversion Channel to Mason Creek), and T101-10-00 (Unnamed Tributary to Mason Creek) from previously approved LOMR 08-06-1677P, for which the Addicks Reservoir Watershed portions have been superseded. Under contract No. HSFEHQ-09-D-0369, FY13, TO1 to FEMA, the Risk Assessment, Mapping, and Planning Partners (RAMPP) incorporated the Addicks Reservoir Watershed study into the FIRMs and FIS. This work was completed in May 2015.

Base map used for this PMR was provided in digital format by the Harris Galveston Area Council and was revised and enhanced by Harris County.

For this PMR, an initial kickoff meeting for the Addicks Reservoir Watershed study was held on October 1, 2010, and attended by representatives from HCFCD, Lockwood, Andrews and Newnam, Inc., Grounds Anderson, Sirrus, Brooks and Sparks, and West Belt Surveying. A final CCO meeting was held on [TBD] and attended by representatives of [insert after meeting happens]. [Once study completed add: All concerns and issues raised at that meeting have been addressed in this study.]

The Addicks Reservoir watershed covers an area approximately 137 square miles in west Harris County and includes six primary streams: Langham Creek (U100-00-00), South Mayde Creek (U101-00-00), Bear Creek (U102-00-00), Horsepen Creek (U106-00-00), Dinner Creek (U120-00-00) and Turkey Creek (W167-00-00), with additional smaller streams. The Addicks Reservoir watershed is located north of Interstate (IH-10), south of U.S. Highway (US) 290, west of Beltway (BW) 8, and east of the Harris County line with Waller County. Approximately 1 square mile of the Addicks Reservoir watershed is within Waller County. The majority of the watershed is located in unincorporated areas of Harris County with only the Addicks Reservoir in the City of Houston.

The Addicks Reservoir and Dam were constructed in the late 1940's under the authorization of the Unites States Army Corps of Engineers (USACE) to provide flood damage protection to the City of Houston and other downstream communities by reducing downstream flooding of Buffalo Bayou (HCFCD Unit # W100-00-00). The Addicks Dam is located on the north side of IH-10 and comprised of five 8-foot by 6-foot gated outlet box conduits.

Table 17. Scope of Revision – [TBD] Revision

Stream	Limits of Revised or New Detailed Study
T101-00-00 (Mason Creek)	From approximately 4,000 feet downstream of Peek Road South to approximately 4,600 feet upstream of Franz Road
T101-10-00 (Unnamed Tributary to Mason Creek)	From the confluence with T101-00-00 (Mason Creek) to approximately 1,700 feet upstream of the confluence with T101-00-00
T101-08-00*	From the confluence with T101-00-00 (Mason Creek) to approximately 5,700 feet upstream
T101-13-00 (South Diversion Channel to Mason Creek)	From the confluence with T101-00-00 (Mason Creek) to just upstream of Morton Road
U100-00-00 (Langham Creek)	From approximately 38,300 feet upstream of the confluence with W100-00-00 (Buffalo Bayou) to approximately 450 feet upstream of South of House Hail Road

*Area went from Zone AO to Zone X (unshaded)

Table 17. Scope of Revision – [TBD] Revision (continued)

Stream	Limits of Revised or New Detailed Study
U101-00-00 (South Mayde Creek) and U101-22-00 (Unnamed Tributary to South Mayde Creek)	From approximately 19,300 feet upstream of the confluence with U100-00-00 (Langham Creek) within Addicks Reservoir to approximately 10,500 feet upstream of Katy Hockley Road
U101-07-00 (Tributary 9.4 to South Mayde Creek)	From the confluence with U101-00-00 (South Mayde Creek) to approximately 3,300 feet upstream of the confluence with U101-00-00 (South Mayde Creek)
U101-08-00 (Tributary 9.6 to South Mayde Creek)	From the confluence with U101-00-00 (South Mayde Creek) to approximately 11,200 feet upstream of the confluence with U101-00-00 (South Mayde Creek)
U102-00-00 (Bear Creek) and U202-01-00 (Bear Creek Diversion Channel)	From approximately 10,800 feet downstream of Barker Cypress Road to approximately 3,900 feet upstream of Longenbaugh Road
U102-01-00 (Unnamed Tributary to Bear Creek)	From the confluence with U102-00-00 (Bear Creek) to approximately 9,275 feet upstream of the confluence with U102-00-00 (Bear Creek)
U106-00-00 (Horsepen Creek)	From the confluence with U200-00-00 (Addicks Reservior Diversion Channel) to approximately 6,000 feet upstream of Queenston Boulevard
U120-00-00 (Dinner Creek)	From the confluence with U100-00-00 (Langham Creek) to approximately 3,100 feet upstream of Fry Road
W167-01-00 (Tributary 3.9 to Turkey Creek)	From the confluence with W167-01-00 (Turkey Creek) to approximately 2,050 feet upstream of Acacia Arbor

In addition to the Addicks Reservoir Watershed study, this revision also incorporated the following LOMRs. These changes are also reflected in Table 8, "Floodway Data," and Exhibit 1, "Flood Profiles". Case number 14-06-1080P also includes revisions to the "Summary of Discharges" table, as shown in Table 18.

Case Number	Date Issued	Project Identifier	Revised Map Panels	Revised Flood Data Tables	Revised Profiles
14-06-1080P	October 10, 2014	524-Acre Stone Creek Ranch Development	48201C0195N & 48201C0385N	K155-00-00	K46P & K47P
13-06-4636P	August 21, 2014	Mason Creek Corporate – Merchants Way Bridge	48201C0595M	N/A	T05P & T06P
14-06-1079P	September 15, 2013	T101-00-00 (Mason Creek)	N/A[1]	T101-00-00	N/A
13-06-0262P	May 20, 2013	T101-00-00 (Mason Creek)	N/A[1]	T101-00-00	N/A
11-06-3712P	September 6, 2011	Centerpoint Energy Bridge Replacement Over HCFCD Unit No. W167-04-00	N/A[2]	N/A	W28P

[1] N/A = Not Applicable. No revision to the Flood Insurance Rate Map (FIRM) panel 48201C0615M, Flood Insurance Study (FIS) report revision only.
[2] N/A = Not Applicable. No revision to FIRM panel 48201C0630M, FIS report revision only.

Topographic information used for basin delineation was derived from LiDAR data flown between February and March 2008 under authority from the Houston-Galveston Area Council (H-GAC) and HCFCD. One-foot contours were developed from the 2008 LiDAR for HCFCD by Merrick & Company. Differential subsidence has occurred across Harris County from 2001 to 2008 varying from less than 0.1 foot in the southeast portion of the county to approximately 0.6 foot in the west. In order to remove the effects of subsidence on the 2008 LiDAR, HCFCD used information provided by the Harris Galveston Subsidence District and the United States Geological Survey. This information provided an accurate approximation of the overall subsidence across the county between 2001 and 2008 at various locations. A more detailed summary of the process and data used can be found in Appendix C, Addicks Reservoir (U100-00-00) Hydraulic Update, 2013 (Reference 10.4.1).

The hydrologic model was updated to reflect current conditions in the Addicks Reservoir Watershed. These updates included changing the modeling version used, from the USACE, Hydrologic Engineering Center (HEC) HEC-HMS, version 3.1.0, to HEC-HMS, version 3.4. The watershed parameters were also updated based on the changes in the land use with associated on-site detention, subbasin delineation, and known improvement projects. The land use parameters (percent urban development and percent impervious) were also updated to reflect 2008 ground conditions. This is consistent with the time period for the capture of the primary topographic resource, the 2008 LiDAR (one-foot contours). Other watershed parameters, such as watershed lengths (L) or percent channel improvement (DCI), were updated where necessary to address know improvement projects or other updates to the watershed. Watershed parameters in the effective model were also updated to ensure consistency with current HCFCD methodology (Reference 10.4.2).

The storage volume that represents the flow attenuation through the overflow area between Cypress Creek and Addicks Reservoir in the effective hydrologic model was approximated during the Tropical Storm Allison Recovery Project. The latest Cypress Creek model was updated in the Harris County, Texas and Incorporated Areas Fifth Revision dated October 16, 2013, which resulted in an update of the overflow characteristics. The updated hydrologic model for the Addicks Reservoir includes this updated overflow from Cypress Creek.

For T-101-00-00 (Mason Creek) and associated tributaries, HEC-HMS was used for developing the hydrologic model as a part of LOMR 08-06-1677P. The LOMR has been superseded due to the Addicks Reservoir update, however the hydrology associated with T-101-00-00 (Mason Creek) and associated tributaries remains valid and has been incorporated in this study. The parameters were updated based on the changes in the land use with associated on-site detention, subbasin delineation, and known improvement projects. The land use parameters (percent urban development and percent impervious) were also updated to reflect 2008 ground conditions. This is consistent with the time period for the capture of the primary topographic resource, the 2008 LiDAR (one-foot contours). Other parameters, such as watershed lengths (L) or percent channel improvement (DCI), were updated where necessary to address know improvement projects or other updates.

Table 18. Revised Summary of Discharges – [TBD] Revision

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) Percent Annual Chance 10-percent	2-percent	1-percent	0.2-percent
K155-00-00					
(Tributary 40.7 to Cypress Creek)					
At mouth	4.17	342	717	963	1,796
At stream mile 1.43	3.03	177	371	499	930
At stream mile 2.32	2.35	167	349	469	874
At stream mile 3.44	1.43	138	289	389	725
T101-00-00					
(Mason Creek)					
At mouth	16.37	4,774	7,666	9,234	13,655
At Fry Road	13.95	3,974	6,402	7,712	11,363
Downstream of Kingsland Boulevard	10.64	2,880	4,644	5,570	8,238
At IH 10	8.76	2,260	3,641	4,366	6,457
At Mason Road	7.71	1,979	3,191	3,824	5,659
Downstream of Colonial Parkway	6.16	1,565	2,528	3,027	4,485
Downstream of Confluence with T101-08-00	4.86	1,563	2,519	3,015	3,481
Downstream of Peek Road	3.38	1,109	1,797	2,163	3,275
Downstream of Franz Road	2.40	724	1,168	1,404	2,133

Table 18. Revised Summary of Discharges – [TBD] Revision (continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) Percent Annual Chance 10-percent	2-percent	1-percent	0.2-percent
T101-03-00					
(South Diversion Channel To Mason Creek)					
At Mouth	1.99	417	676	809	1,264
U100-00-00					
(Langham Creek)					
At Addicks Dam Road	136.76	21,628	35,767	43,220	64,101
At confluence of U101-00-00 (South Mayde Creek)	125.98	19,066	31,755	38,478	57,237
At confluence of U102-00-00 (Bear Creek)	85.94	14,814	24,511	29,581	43,452
At Clay Road	46.26	10,194	16,688	20,052	28,915
At confluence of U118-00-00	21.44	4,575	7,362	8,760	12,590
At confluence of U120-00-00 Dinner Creek	18.56	3,338	5,332	6,378	9,378
At Longenbaugh Road	11.67	1,365	2,330	2,882	4,629
At Househahl Road	0.00	--	57	153	646
U101-00-00					
(South Mayde Creek)					
At confluence with U100-00-00 (Langham Creek)	40.04	5,072	8,775	10,551	15,941
At confluence of U101-03-00	31.09	5,017	7,814	9,153	13,120
At confluence with U101-08-00 (Tributary 9.6 to South Mayde Creek)	23.10	3,237	5,211	6,267	9,693
At Stockdick School Road	14.36	1,930	3,197	3,912	6,464
At Katy Hockley Cut Off Road	8.25	1,555	2,543	3,077	4,662
U101-07-00					
(Tributary 9.4 to South Mayde Creek)					
At mouth	0.33	33	95	132	255
Just upstream of Elrod Road	0.19	86	150	187	244
Just downstream of Grand Parkway	0.18	68	106	124	181
Just downstream of Porter Road	0.00	--	4	20	40
U101-08-00					
(Tributary 9.6 to South Mayde Creek)					
At mouth	2.47	476	724	870	1,353
At Grand Parkway	1.70	255	393	465	700

-- Data Not Available

Table 18. Revised Summary of Discharges – [TBD] Revision (continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) Percent Annual Chance 10-percent	2-percent	1-percent	0.2-percent
U101-22-00 (Unnamed Tributary to South Mayde Creek)					
Downstream of Pitts Road	0.00	452	1,106	1,572	3,036
U102-00-00 (Bear Creek)					
Upstream of State Highway 6	30.80	3,647	6,243	7,601	11,741
Downstream of Fry Road	20.60	2,202	3,882	4,694	6,697
At Grand Parkway	13.61	1,453	2,904	4,568	12,136
Downstream of Katy Hockley Cut Off Road	6.17	1,749	4,728	6,845	14,237
U102-01-00 (Unnamed Tributary to Bear Creek)					
Downstream of Clay Road	2.93	1,463	2,196	2,542	3,597
U106-00-00 (Horsepen Creek)					
At mouth	18.99	4,610	7,480	8,919	12,737
At State Highway 6 (FM 1960)	13.95	3,261	5,194	6,251	9,224
At confluence of U106-13-00	10.32	1,663	2,695	3,250	4,817
At confluence of U106-10-00	4.85	530	818	980	1,437
Downstream of Baker Cypress Road	2.99	420	714	883	1,380
U120-00-00 (Dinner Creek)					
Downstream of Barker Cypress Road	5.01	1,213	1,905	2,270	3,350
U200-00-00 (Addicks Reservoir Diversion Channel)					
At confluence of U106-00-00 (Horsepen Creek)	43.70	9,892	16,013	19,258	27,615
W167-01-00 (Tributary 3.9 to Turkey Creek)					
At mouth	4.06	1,219	1,872	2,198	3,129
At West Little York Road	1.74	901	1,313	1,507	2,103

The hydraulic models were updated to reflect the current conditions in the Addicks Reservoir Watershed. These updates included changing the modeling version used, from HEC-RAS, version 3.0.1, to HEC-RAS, version 4.1. Modeled flows were based on the updated hydrology of the watershed that reflects current conditions. One-foot contours, derived from LiDAR, were used as the topographic surface to update the overbank topography in the hydraulic models. New field survey data was used, for 27 structures constructed after the development of the effective models or significantly modified since the effective models were developed), to reflect current ground conditions within the channel banks. The hydraulic models also evaluated the geometric components of the effective hydraulic models, such as cross sections, n-values, and streams centerlines for potential inconsistencies with HCFCD methodology. Some of these inconsistencies included the routing step used and the impacts on peak flows due to updated storage models for the watershed.

The effective cross sections were the basis for the updated cross sections. Cross sections were compared with the one-foot contours and survey and modified where needed. These modifications included reorienting cross sections to better represent the overall stream flood wave, lengthening or shortening, relocating to avoid bridge abutments or to better follow surveyed elevation points.

Starting water surface elevations for Langham Creek, Bear Creek, South Mayde Creek, and Tributary 3.9 to Turkey Creek were set at known water surface elevations from the static pool elevations of Addicks Reservoir. These static pool elevations were based on the report "Static Pool Water Surface Elevation in Addicks (U100-00-00) and Barker (T100-00-00) Reservoirs" prepared December 2013 by Brown and Gay Engineers, Inc. The starting water surface elevations for Tributary 9.4 to South Mayde Creek, Tributary 9.6 to South Mayde Creek, Tributary 4.5 to Bear Creek, Horsepen Creek, and Dinner Creek were based on the normal depth method.

Overflows out of the Cypress Creek Watershed contribute significant flow into the Addicks Reservoir Watershed. A coupled 1D/2D model was developed as part of the Cypress Creek Overflow Management Study to better understand the overflow phenomenon and evaluate potential flood mitigation measures. In the model, Cypress and Addicks Watersheds were modeled together. Flow Hydrographs from the Cypress Creek PMR HEC-HMS output were used as 2D model flow input. The channel area of Cypress Creek in Cypress Creek Watershed and South Mayde, Bear and Langham Creeks in the Addicks Watershed were modeled in 1D and the overbank areas in 2D. H-GAC 2008 LiDAR based topographic data with 5 ft resolution was used to develop the 1D cross-sections. The cross-sections were placed and named the same as in the effective HEC-RAS model. A 70 ft grid cell size was used for the overbank area 2D computations. The various berms and elevated roadways in the project area were digitized into the model to better define the high points in the area that would have been subdued by the 70 ft grid cell. All culverts were coded into the model using data from effective PMR HEC-RAS model. Bridges were modeled using rating curves developed from the PMR HEC-RAS model. The manning's "n" roughness coefficients for the 1D channel area were also from the PMR HEC-RAS model. The roughness co-efficient in the 2D overbank area were developed based on the Land Use and Land Cover (LULC) data provided by HCFCD and H-GAC. The LULC data had similar classification as the HCFCD data, but for Agricultural area which was further divided to highlight lands no longer being cultivated. The roughness values varied from 0.22 in dense undeveloped areas to 0.08 for

open lands.

Figure 12, "AE Overflow Base Flood Elevation Map," may be used to estimate BFEs in an area defined by the results from a 2D modeling analysis. More precise results are available as output from the effective model. Shown on the map are points spaced 630 feet apart connected by gridlines and labeled with the BFEs (in feet) for each point location. The gridlines and points form grid squares. For points within grid squares, take a distance-weighted average of the four points at the corners of the square. For points along a gridline, take a distance-weighted average of the elevations of the two points at either end of the gridline.

Gaps in the points within the 2D modeling Limit indicate locations where the ground elevation is higher than the BFE. **For BFEs in the mapped floodplain near these areas**, use a conservative estimate of the highest BFE of the 2 or 3 nearest points.

For T-101-00-00 (Mason Creek) and associated tributaries, a HEC-RAS model was developed as a part of LOMR 08-06-1677P. The LOMR has been superseded due to the Addicks Reservoir update, however the hydraulic modeling associated with T-101-00-00 (Mason Creek) and associated tributaries remains valid and has been incorporated in this study.

Overbank Manning's "n" Values were developed with the aid of aerial photography following the HCFCD Policy, Criteria, and Procedures Manual criteria. The channel and overbank "n" values for the streams listed below are shown in Table 19. "Revised Manning's "n" Values – [TBD] Revision." For the streams not listed below the Manning's "n" Values have not been revised, please refer to Section 3.2, "Hydraulic Analyses."

Table 19. Revised Manning's "n" Values – [TBD] Revision

Stream	Channel "n"	Overbank "n"
U100-00-00 (Langham Creek)	0.04-0.055	0.07-0.15
U101-00-00 (South Mayde Creek)	0.015-0.06	0.05-0.15
U101-07-00 (Tributary 9.4 to South Mayde Creek)	0.04	0.07-0.15
U101-08-00 (Tributary 9.6 to South Mayde Creek)	0.015-0.04	0.07-0.15
U102-00-00 (Bear Creek)	0.015-0.06	0.07-0.15
U102-01-00 (Unnamed Tributary to Bear Creek)	0.04-0.06	0.07-0.15
U106-00-00 (Horsepen Creek)	0.015-0.04	0.07-0.15
U120-00-00 (Dinner Creek)	0.015-0.04	0.07-0.15
W167-01-00 (Tributary 3.9 to Turkey Creek)	0.015-0.04	0.07-0.15

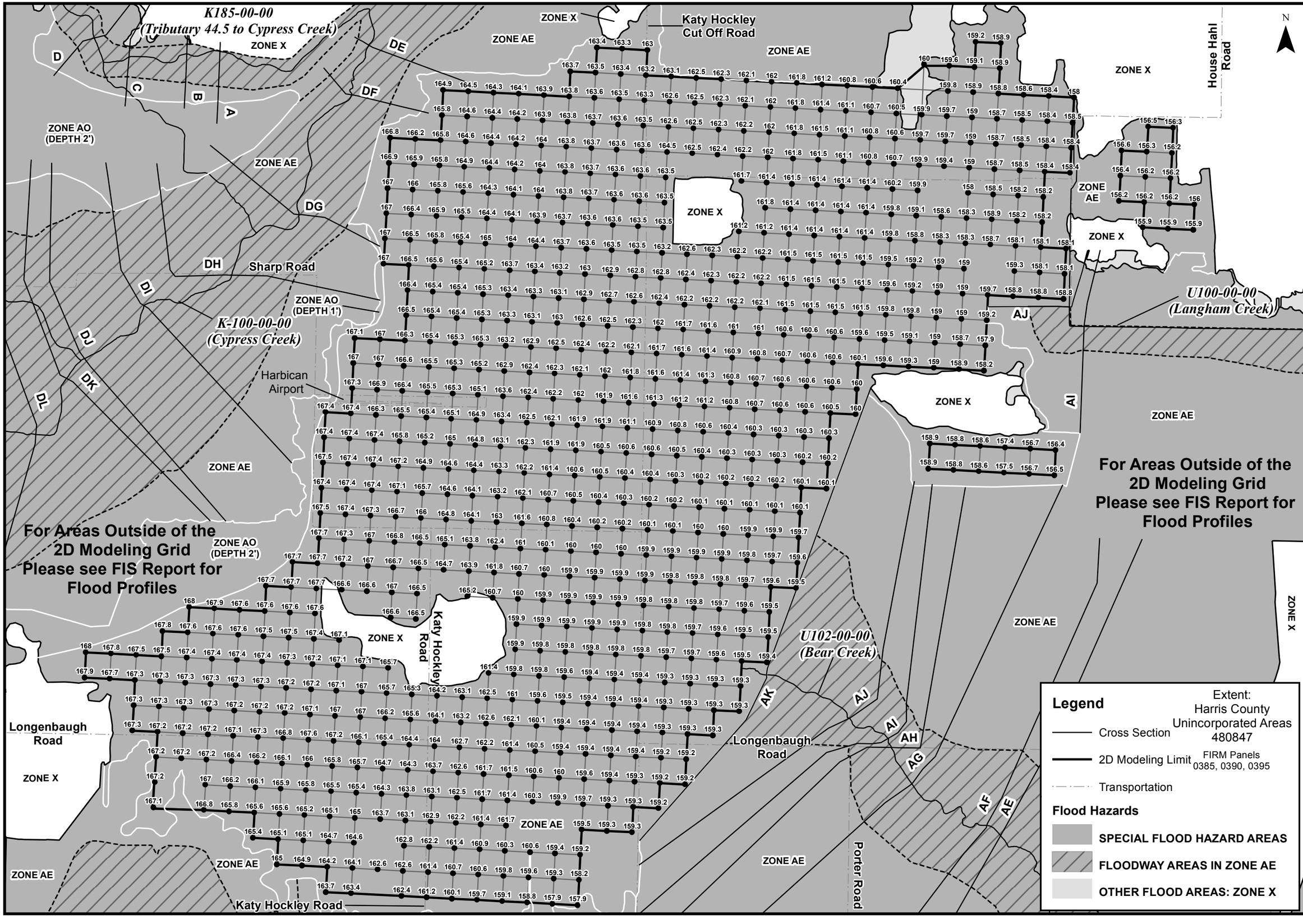
Floodplain boundaries were delineated topographic information derived from LiDAR data flown between February and March 2008 under authority from the H-GAC and HCFCD as described previously for this revision.

Table 8, "Floodway Data," and Exhibit 1, "Flood Profiles," were revised to reflect changes as a result of this restudy.

10.4.1 Addicks Reservoir (U100-00-00) Hydraulic Update, Harris County Flood Control District, Houston, Texas, June 19, 2013.

10.4.2 Addicks Reservoir (U100-00-00 Hydrology Update, Harris County Flood Control District, Houston, Texas, June 19, 2013.

AE OVERFLOW BASE FLOOD ELEVATION MAP



FEDERAL EMERGENCY MANAGEMENT AGENCY

HARRIS COUNTY, TX
AND INCORPORATED AREAS

FIGURE 12