

APPENDIX A FREP DISTRIBUTION

This FREP has been distributed to:

1. Fire Chief
2. Incident Commander
3. EMA Director
4. EMA Deputy Director
5. Floodplain Administrator, Planning Department
6. Emergency Operations Director (E911)
7. Public Safety PIO
8. Mayor

APPENDIX B

INCIDENT COMMAND SYSTEM FORMS

For tracking purposes during and record keeping/reimbursement following a flood event, all information, observations, and actions as well as the time that the action or event occurred must be recorded using FEMA's Incident Command System (ICS) Form or equivalent. These forms are available at http://www.fema.gov/pdf/emergency/nims/ics_forms_2010.pdf.

APPENDIX C

FLOOD DETECTION & FORECAST RESOURCES

- C-1 USGS STREAM GAGES & FLOOD STAGES
- C-2 USGS STREAM GAGE HEIGHT, AHPS LEVEL & ASSOCIATED FLOOD FREQUENCY
- C-3 USGS/AHPS REAL TIME GAGES
- C-4 CRITICAL RAINFALL DURATIONS FOR VARIOUS WATERSHEDS AFFECTING COLUMBUS
- C-5 PRECIPITATION FORECAST
- C-6 FLASH FLOOD FORECAST
- C-7 PRECIPITATION DEPTH-DURATION-FREQUENCY CURVES
- C-8 USGS INUNDATION MAPPING LIBRARY
- C-9 CBBEL FLOOD DEPTH MAPS

APPENDIX C-1

USGS STREAM GAGES & FLOOD STAGES

C-1 USGS STREAM GAGES & FLOOD STAGES

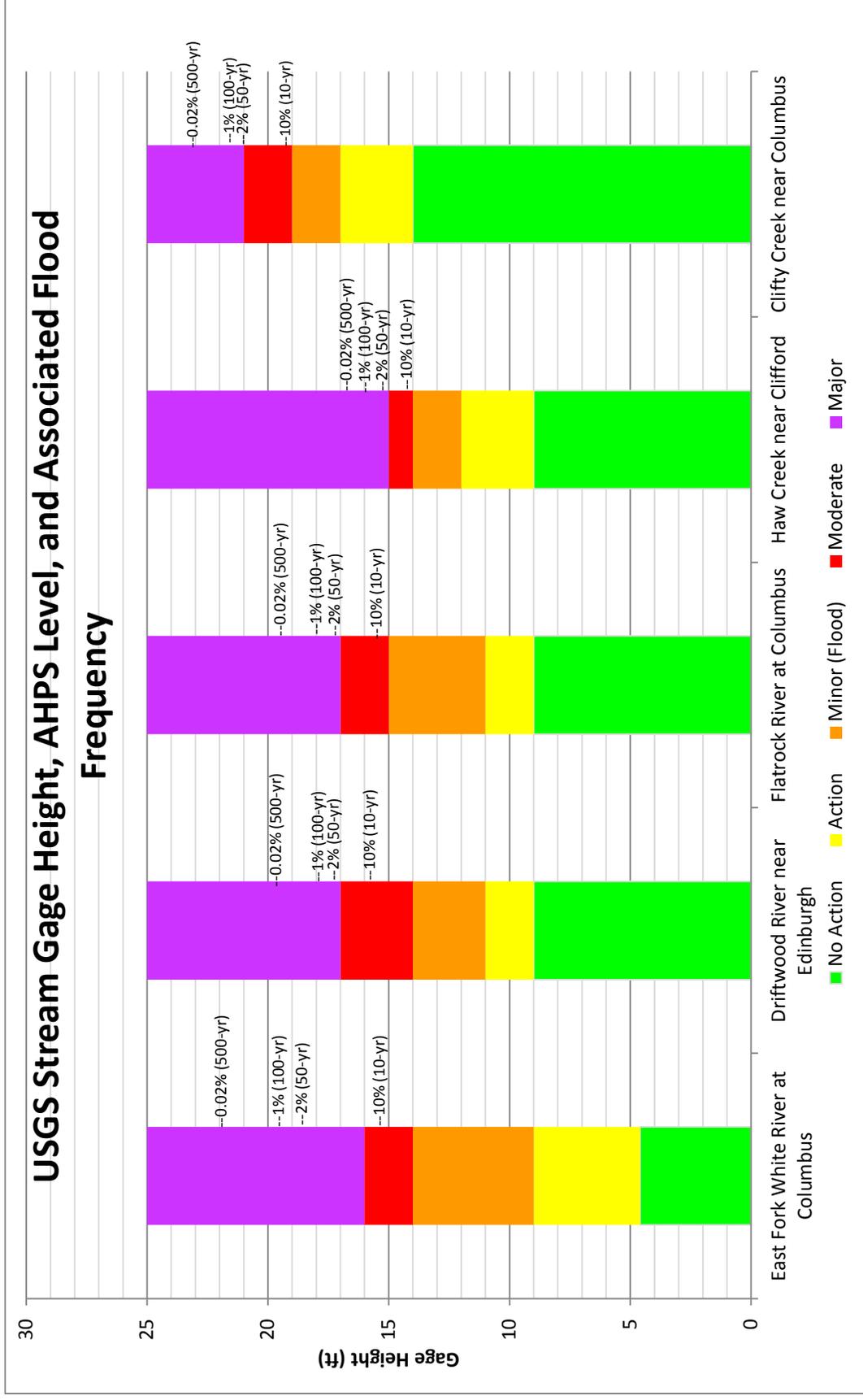
MAIN STEM WATERWAYS & TRIBUTARIES	USGS GAGE NO.	USGS GAGE NAME	NWS AHPS FLOOD LEVEL (ft) ¹				
			Action Flood Stage	Minor Flood Stage	Mod. Flood Stage	Major Flood Stage	Forecast
East Fork White River <i>(applies to tributaries east of SR 11 and Driftwood River east of I-65)</i>	3364000	East Fork White River at Columbus	4.6	9	14	16	X
Airport Tributary							
Denios Creek							
Denios Creek Tributary							
Opossum Creek							
East Fork White Creek							
East Fork White Creek Tributary							
North Ogleville Tributary							
Driftwood River <i>(west of I-65)</i>	3363000	Driftwood River near Edinburgh	9	11	14	17	X
Catherine Creek							
Wolf Creek							
Flatrock River	3363900	Flatrock River at Columbus	9	11	15	17	
Big Slough							
Haw Creek	3364042	Haw Creek in Hope, IN <i>(for forecast)</i>	7.5	9	12	14	
	3364200	Haw Creek near Clifford <i>(for forecast and action)</i>	9	12	14	15	
Clifty Creek	3364500	Clifty Creek at Hartsville <i>(for forecast)</i>	6	9	11	13	
	3364650	Clifty Creek near Columbus	14	17	19	21	
Sloan Branch							

¹ <http://water.weather.gov/ahps2/index.php?wfo=ind> as reported 11/30/12

APPENDIX C-2

USGS STREAM GAGE HEIGHT, AHPS LEVEL & ASSOCIATED FLOOD FREQUENCY

C-2 USGS STREAM GAGE HEIGHT, AHPS LEVEL & ASSOCIATED FLOOD FREQUENCY



APPENDIX C-3

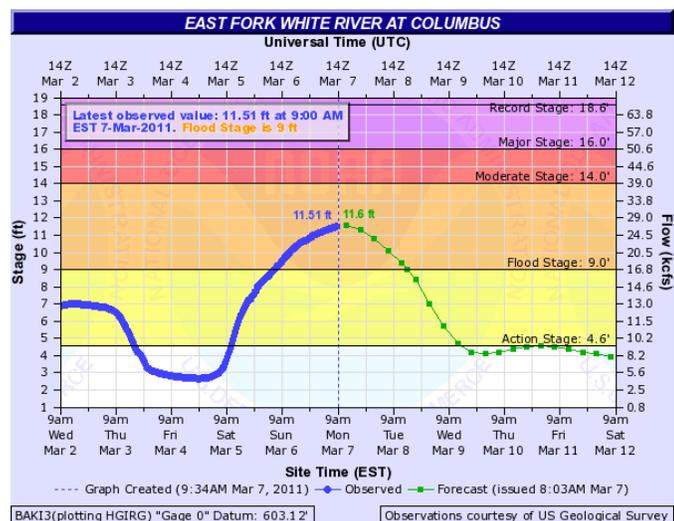
USGS/AHPS REAL TIME GAGES

C-3 USGS/AHPS REAL TIME STREAM GAGES

The 7 stream gages in Columbus and upstream in Bartholomew County noted in this Plan have “Action”, “Flood”, “Moderate”, and “Major” flood event levels designated by the NWS based on historical information and local input. These levels are shown compared to the USGS real-time stream gage data and flood forecast information provided by the NWS through the Advanced Hydrological Prediction Service (AHPS). Of these, 2 gages (East Fork White River at Columbus and Driftwood River near Edinburg) have observed real-time stream heights and 5-day predicted stream height. The remaining 5 have observed real-time stream height only.

To view USGS gage observed stages:

1. <http://water.weather.gov/ahps2/index.php?wfo=ind>
2. Observe flood condition based on color coding
3. Select stream gage of interest
4. Click on “Hydrograph Page” for flood categories, historic crests, flood impacts and photos



APPENDIX C-4

CRITICAL RAINFALL DURATIONS FOR VARIOUS WATERSHEDS AFFECTING COLUMBUS

C-4 CRITICAL RAINFALL DURATIONS FOR VARIOUS WATERSHEDS AFFECTING COLUMBUS

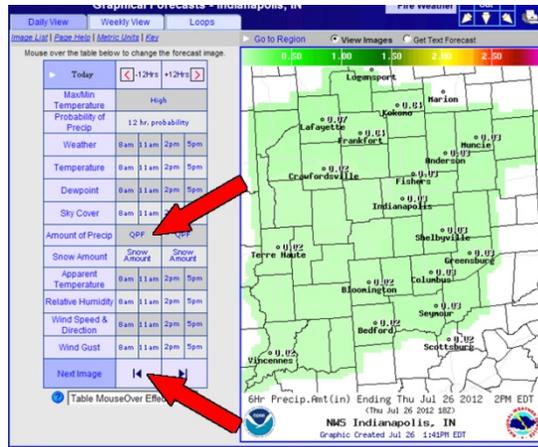
Stream	Critical Rainfall Durations
Airport Tributary	2-6 hr
Clifty Creek	12-72 hr
Denios Creek	6-24 hr
East Fork White Creek	6-48 hr
Flatrock River	24-72 hr
Haw Creek	12-48 hr
Opossum Creek	2-6 hr
Sloan Branch	6-24 hr
Wolf Creek	6-24 hr

APPENDIX C-5
PRECIPITATION FORECAST

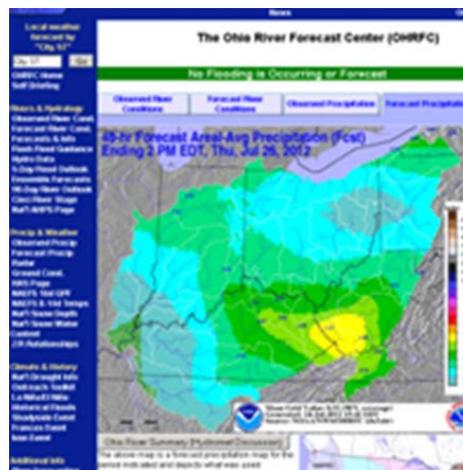
C-5 PRECIPITATION FORECASTS

The NWS precipitation forecast is updated hourly and provides 6-hour increments of temperature, probability of precipitation, snow amount, wind speed and direction, and wind gusts data. A more detailed graphic for the 48-hour increment forecast is through the NWS Ohio River Forecast Center (OHRFC). The National Operational Hydrologic Remote Sensing Center has maps that illustrate the water equivalent of snow on the ground.

- To view up to date rainfall 12 & 6-hour forecasts:
3. www.crh.noaa.gov/ind/
 4. Select "Forecast Graphics" tab
 5. Mouse over the table to change the forecast information
 6. "QPF" shows precipitation in 6-hr increments and "Next Image" shows 3-days of QPF data



- For 48-hour rainfall forecasts:
1. <http://www.erh.noaa.gov/ohrfc/>
 2. Select the "Forecast Precipitation" tab



APPENDIX C-6
FLASH FLOOD FORECAST

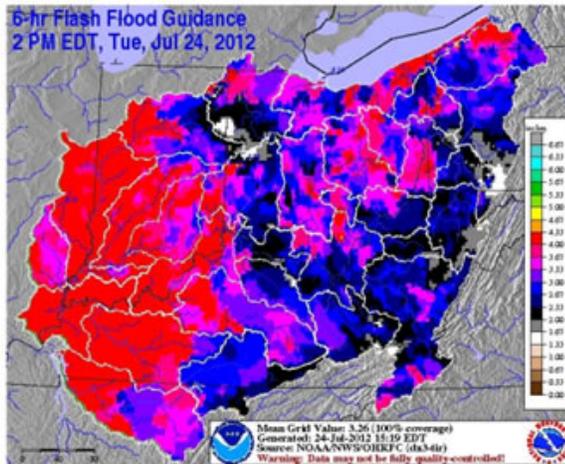
C-6 FLASH FLOOD FORECAST

The NWS Ohio River Forecast Center has Flash Flood Guidance maps that indicate the amount of rainfall needed in the specified number of hours in order to begin flooding. The maps are refreshed a few times a day (in the mid-morning, mid-afternoon, and by late evening). In significant flooding events, they are also updated during the overnight hours.

- To view Flash Flood Guidance:
1. <http://www.erh.noaa.gov/ohrfc/FFGuidance.html>
 2. Select the flood duration of interest (1, 3, 6, 12 or 24-hr)



NWS Flash Flood Guidance



Example of NWS 6-hr Flash Flood Guidance

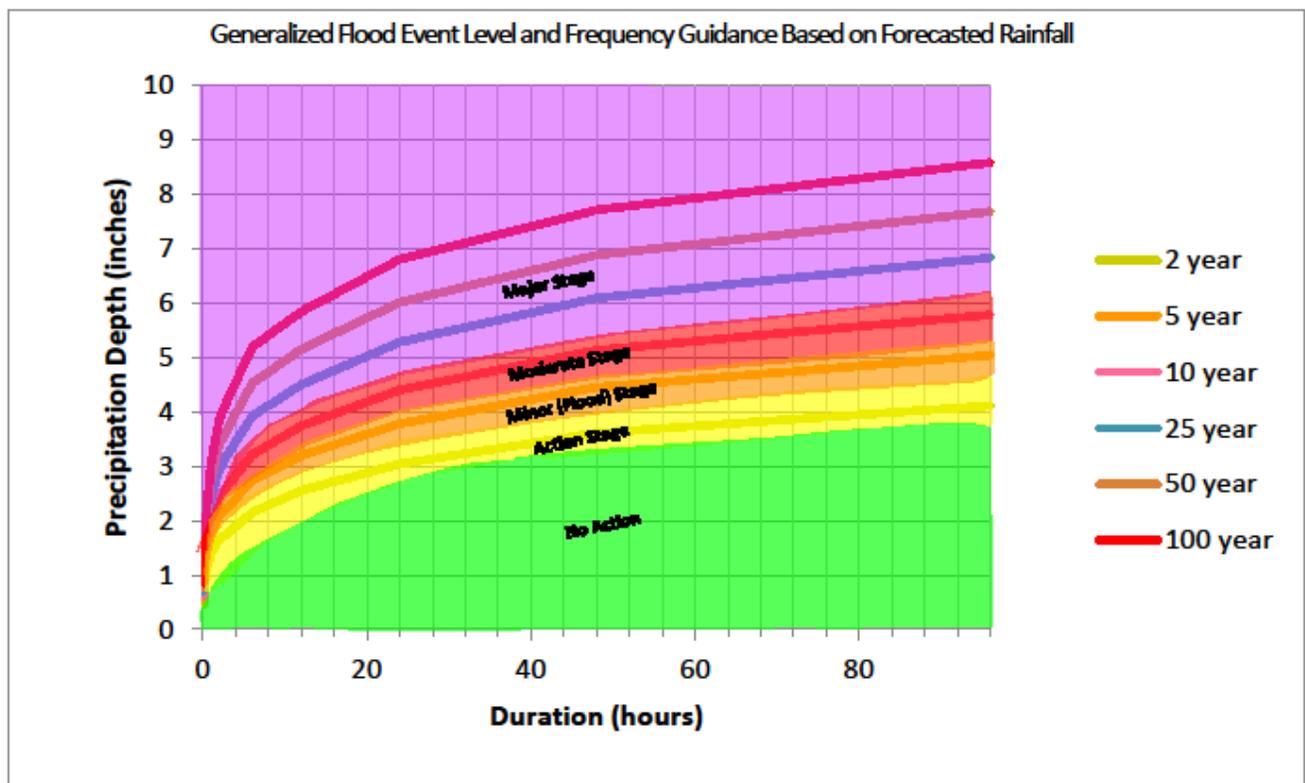
APPENDIX C-7

PRECIPITATION DEPTH-DURATION-FREQUENCY CURVES

C-7 PRECIPITATION DEPTH-DURATION-FREQUENCY CURVES

Because rainfall events happen in all sorts of amounts and durations and resulting flooding depends on both factors, precipitation depth vs. duration graphs provide a way to combine both factors to obtain a general idea of the frequency flood level that could result from a given forecasted rainfall event for watersheds that do not have other stream gage related forecast tools.

By obtaining the forecasted precipitation totals for various time increments that are critical for a given watershed (this varies by size and physical characteristics of a watershed), the expected frequency of the rainfall can be determined from the graph and related to flood depth mapping or FIS studies to get an approximate idea of flood extent and depths to expect.



APPENDIX C-8

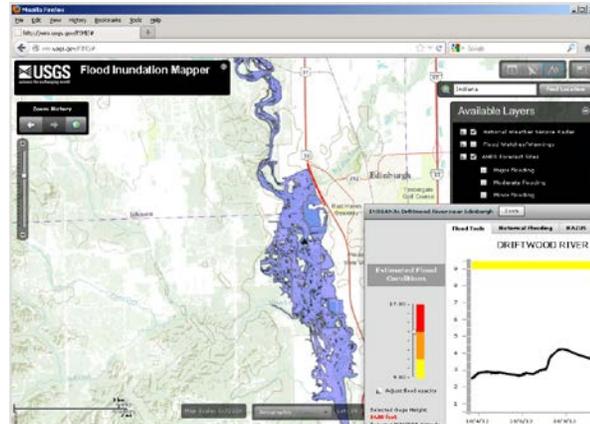
USGS INUNDATION MAPPING LIBRARY

C-8 USGS INUNDATION MAPPING LIBRARY

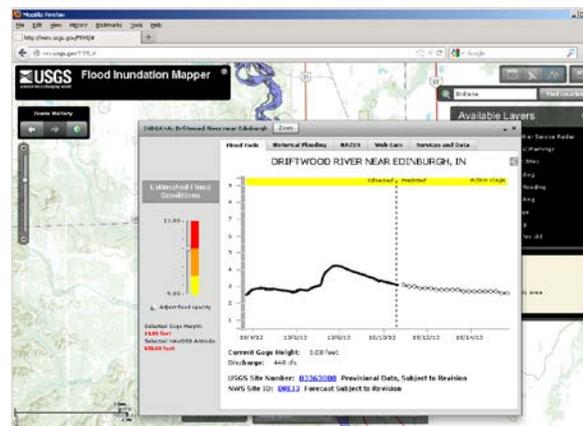
USGS is partnering with the NWS, USACE and FEMA to develop flood inundation maps in locations across the country identified to be at the highest risk for flooding, including Columbus, IN. The USGS anticipates that the Inundation Map Library for East Fork White River, Flatrock River and Haw Creek will be completed in 2013. The Inundation Map Library for Driftwood River is already completed.

To view USGS gage stages and associated Inundation Maps:

1. <http://wim.usgs.gov/FIMI/>
2. Zoom or type Columbus, IN in "Find Location"
3. Select black triangle corresponding to gage of interest
4. View observed and forecasted gage stages
5. Select stage of interest using slider bar to view inundation mapping
6. Select desired background map from options
7. View flood depths by clicking on point of interest



Expected Inundation Area if Flood Stage at Driftwood at Edinburg Gage Reaches Stage of 14 feet



Example of Web Site Observed Stage Data

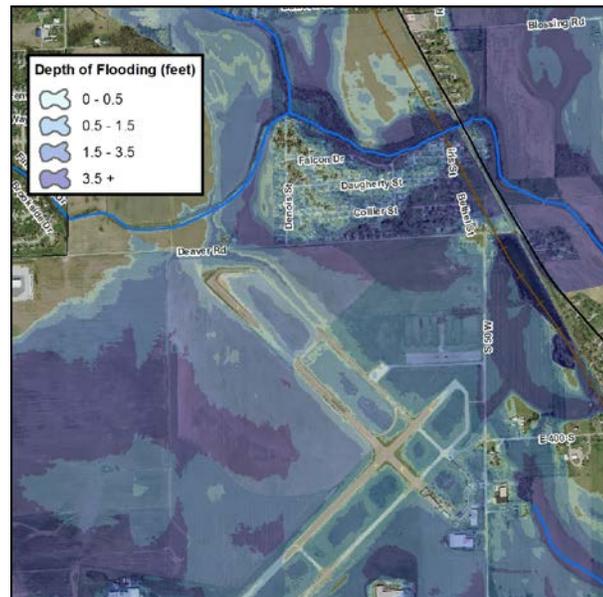
APPENDIX C-9
CBBEL FLOOD DEPTH MAPS

C-9 CBBEL FLOOD DEPTH MAPS

As part of the Flood Risk Management Plan prepared for the City, CBBEL developed Flood Depth Maps for portions of the East Fork White River, Airport Tributary, Denios Creek, Opossum Creek, Driftwood River, Flatrock River, Haw Creek, Clifty Creek, and Sloan Branch. For each of these areas studied, flood depths are illustrated for the 10-year, 50-year, 100-year, and 500-year flood frequencies. These flood depth maps can be used in conjunction with the USGS Inundation Map Library and NWS forecast tools to provide information on potential extent and depth of flooding along Columbus area streams.

To view CBBEL Flood Depth Maps:

1. *[location of maps]*
2. Select flood frequency (10, 50, 100 or 500-year)
3. Zoom to area of interest



Example of flood depth maps

APPENDIX D NOTIFICATION CONTACT LIST & SUMMARY OF EXPECTED ACTIONS

- D-1 FLOOD EVENT NOTIFICATION CONTACT LIST
- D-2 SUMMARY OF EXPECTED ACTIONS DURING A FLOOD FIGHT

APPENDIX D-1

FLOOD EVENT NOTIFICATION CONTACT LIST

D-1 FLOOD EVENT NOTIFICATION CONTACT LIST

ORGANIZATION	NAME	EMAIL	PHONE
Fire Chief <i>(acting as FREP Coordinator)</i>	David Allmon	dallmon@columbus.in.gov	376-2679 603-2093 (c)
Alternate	Mike Kutsko	mkutsko@columbus.in.gov	376-2679 603-2086 (c)
EMA Director <i>(acting as FREP Coordinator)</i>	Dennis Moats	dmoats@bartholomew.in.gov	379-1680 371-0104 (c)
Alternate	Reigna Zeigler	rzeigler@bartholomew.in.gov	379-1680 343-2721 (c)
NWS	On-Duty		
E911 Director	Ed Reuter	ereuter@bartholomew.in.gov	379-1551 344-6909 (c)
Alternate	Julie Pierce	jpierce@bartholomew.in.gov	379-1583 343-6984 (c)
Incident Commander	TBD		
Alternate	TBD		
Mayor	Kristin Brown	kbrown@columbus.in.gov	376-2500 447-2994 (c)
Utilities Director	Keith Reeves	kreeves@columbusutilities.org	376-2400 x422 350-2686 (c)
Engineering Director	David Hayward	dhayward@columbus.in.gov	376-2540 344-0920 (c)
Planning <i>(Floodplain Administrator)</i>	Thom Weintraut	tweintraut@columbus.in.gov	376-2550 344-9645 (c)
Alternate	Jeff Bergman	jbergman@columbus.in.gov	376-2550 343-1200 (c)
City Council	Dascal Bunch	dbunch@columbus.in.gov	
City Council	Ryan Brand	rbrand@columbus.in.gov	
City Council	Frank Jerome	fjerome@columbus.in.gov	
City Council	Frank Miller	fmiller@columbus.in.gov	
City Council	Tim Shuffett	tshuffett@columbus.in.gov	
City Council	Jim Lienhoop	jlienhoop@columbus.in.gov	
City Council	Aaron Hankins	ahankins@columbus.in.gov	

ORGANIZATION	NAME	EMAIL	PHONE
County Commissioner	Larry Kleinhenz	dlonderee@bartholomew.in.gov	350-0052 (c)
County Commissioner	Carl Lienhoop	dlonderee@bartholomew.in.gov	350-0969 (c)
County Commissioner	Rick Flohr	dlonderee@bartholomew.in.gov	350-0051 (c)
IDHS	Through EMA		
Red Cross	Mary Ellen Anable	meanablearc@incolumbus.com	379-9551 350-3703 (c)
Surveyor (Drainage Board)	Tom Finke	tfinke@bartholomew.in.gov	379-5348
Code Enforcement	Brian Thompson	bthompson@bartholomew.in.gov	379-1535
School Buses	Karen Wetherald	wetheraldk@bcsc.k12.in.us	376-4246 343-5771 (c)
EMS/Hospital	Dan Spartz	dspartz@crh.org	376-5270 350-8156 (c)
	Martha Myers	mmyers@crh.org	376-5658 350-4673 (c)
Sheriff (Law Enforcement)	Mark Gorbett	mgorbett@bartholomew.in.gov	379-1648 343-1566 (c)
Police Chief (Law Enforcement)	Jason Maddix	jmaddix@columbus.in.com	376-2600 343-1875 (c)
Fire County Fire Chief's Assoc. President	Rodney Ferrenburg	rferrenburg@ecifd.org	343-8177 (c)
County Highway	Danny Hollander	dhollander@bartholomew.in.gov	379-1660
Street Department	Bryan Burton	bburton@columbus.in.gov	376-2508 343-6777 (c)
Alternate- Streets	Richard Macy	rmacy@columbus.in.gov	343-6001 (c)
Alternate- Transit	Cindy Setser	csetser@columbus.in.gov	376-2506 374-2827 (c)
Public Safety PIO - City	Matt Myers	mmyers@columbus.in.gov	376-2605 603-2026 (c)
Public Safety PIO -County	Todd Noblitt	tnoblitt@bartholomew.in.gov	343-6560 (c)
Media- (WCSI)	John Foster	jfoster@wcsiradio.com	374-9467 (c)
Volunteer Fire Department Clay Township	Doyle Morgan	blueflash901@yahoo.com	343-2408 (c)
Volunteer Fire Department Clifford	Steve LaRue	cliffordfire@gmail.com	343-8069 (c)
Volunteer Fire Department Columbus Township	Rodney Ferrenburg	rferrenburg@ecifd.org	343-8177 (c)

ORGANIZATION	NAME	EMAIL	PHONE
Volunteer Fire Department Elizabethtown	Tom Nienabor	tdnienabor@hotmail.com	343-7225 (c)
Volunteer Fire Department German Township	John Searle	jrs809195@hotmail.com	552-3652 (c)
Volunteer Fire Department Harrison Township	Wally Dietz	walldietz@bildico.com	343-4801 (c)
Volunteer Fire Department Hope	Jon Ross	hopevolunteerfiredepartment@ hotmail.com	344-9607 (c)
Volunteer Fire Department Jonesville/Wayne Township	Rick Trimpe	rtrimpe@bartholomew.in.gov	343-3244 (c)
Volunteer Fire Department Southwest	Brad Lovins	blovins@ntndriveshaft.com	764-0020 (c)
Volunteer Fire Department Hartsville	Ed Johnson	wejohn@yahoo.com	371-7968 (c)

APPENDIX D-2

SUMMARY OF EXPECTED ACTIONS DURING A FLOOD FIGHT

D-2 SUMMARY OF EXPECTED ACTIONS DURING A FLOOD FIGHT

EVENT	ACTION	REFERENCE EXHIBIT &/or APPENDIX	FIRE CHIEF (as FREP Co.)	EMA DIRECTOR (as FREP Co.)	E911	INCIDENT COMMANDER	MAYOR	UTILITIES	ENGINEERING	PLANNING (Floodplain)	CITY COUNCIL	COUNTY COMM.	IDHS	RED CROSS (Animal Care)	EMA	SURVEYOR	CODE ENFORCEMENT	BUSES (School/Transit)	EMS/HOSPITAL	LAW ENFORCEMENT	FIRE	PUBLIC SAFETY PIO	MEDIA	VOL. FIRE DEPTS.	ROAD CREWS (Streets/Hwy)	
ACTION FLOOD STAGE	Activate FREP		X	X																						
	A. Determine Areas Affected		X	X																						
	Make Notifications		X	X		X																				
	B. Monitor Data & Conditions		X	X																						
	Monitor USGS/NWS Data			X																						
	Run Flood Safe Routes	Ex.5																							X	
	C. Warning & Evacuation																									
	D. Record Observations & Actions	D-2		X	X		X																			X
Evaluate the Situation			X	X																						
MINOR FLOOD STAGE	A. Determine Areas Affected	C-1 & C-2 Ex.1	X	X																						
	Make Notifications		X	X		X																				
	B. Monitor Data & Conditions		X	X																						
	Monitor USGS/NWS Data			X																						
	Run Flood Safe Routes	Ex.5																							X	
	Staff Sand Bag Pick-up																								X	
	C. Warning & Evacuation																									
	Identify Impassible Roads	E-13		X																						X
	Identify Affected Public	Ex.E-1 E-1 to E-12		X	X					X																
	D. Record Observations & Actions	D-2		X	X		X																			X
Evaluate the Situation			X	X																						
MODERATE FLOOD STAGE	A. Determine Areas Affected	C-1 & C-2 Ex.2 to Ex.4	X	X						X																
	Make Notifications		X	X	X	X																				
	Open EOC														X											
	B. Monitor Data & Conditions		X	X																						
	Monitor USGS/NWS Data			X																						
	Run Flood Safe Routes	Ex.5																							X	
	Staff Sand Bag Pick-up																								X	
	C. Warning & Evacuation			X	X		X															X	X			
	Identify Impassible Roads	E-13		X																						X
Identify Affected Public	Ex.E-2 to Ex.E-4 E-1 to E-12		X	X					X																	
Prepare Shelters														X												

EVENT	ACTION	REFERENCE EXHIBIT &/or APPENDIX	FIRE CHIEF (as FREP Co.)	EMA DIRECTOR (as FREP Co.)	E911	INCIDENT COMMANDER	MAYOR	UTILITIES	ENGINEERING	PLANNING (Floodplain)	CITY COUNCIL	COUNTY COMM.	IDHS	RED CROSS (Animal Care)	EMA	SURVEYOR	CODE ENFORCEMENT	BUSES (School/Transit)	EMS/HOSPITAL	LAW ENFORCEMENT	FIRE	PUBLIC SAFETY PIO	MEDIA	VOL. FIRE DEPTS.	ROAD CREWS (Streets/Hwy)
	Gathering Place Coordination	E-14												X											
	Notification to Affected Public				X																	X	X		
	Initiate Post-Flood Data Collection	F-1								X															
	D. Record Observations & Actions	D-2	X	X	X	X								X	X							X			X
	Evaluate the Situation		X	X																					
MAJOR FLOOD STAGE	A. Determine Areas Affected	C-1 & C-2 Ex.2 to Ex.4	X	X																					
	Make notifications		X	X	X																				
	B. Monitor Data & Conditions		X	X																					
	Monitor USGS/NWS Data			X																					
	Run Flood Safe Routes	Ex.5																							
	C. Warning & Evacuation																								
	Identify Impassible Roads	E-13	X																						X
	Identify Affected Public	Ex.E-2 to Ex.E-4 E-1 to E-12	X	X						X															
	Open shelters													X											
	Gathering Place Coordination	E-14												X											
	Notification to Affected Public				X																				
	Evacuate endangered public																	X		X	X	X			X
	Post-Flood Data Collection	F-1								X															
	D. Record Observations & Actions	D-2	X	X	X	X								X	X			X		X	X	X			X
Evaluate the Situation		X	X																						
TERMNATE & FOLLOW-UP	A. Terminate Flood Event		X	X																					
	B. Make Notifications		X	X	X	X																			
	C. Run Flood Safe Routes	Ex.5																							X
	D. Conduct Damage Assessment									X					X	X	X								
	Document Depth & Areas Flooded	F-1								X						X									
	Evaluate Damaged Structures	F-2 & F-3								X					X		X								
	Inspect Bridges for Visible Damage	F-2 & F-3							X																
	E. Collect & Dispose of Debris																								X
	F. Re-enter Evacuated Areas																	X		X	X	X			X
	Close Shelters													X											
	G. Close EOC														X										
	H. Restock Sand Bag Supply																								X
	Restock & Repair Signs & Barricades																								X
	I. Record Observations & Actions	D-2	X	X	X	X			X	X				X	X			X		X	X	X			X
J. Conduct Flood Fight Debrief		X	X	X	X				X				X	X					X	X	X			X	

APPENDIX E

EXPECTED EXTENT OF FLOODING IN FLOODPRONE AREAS

- E-1 EXPECTED EXTENT OF FLOODING ALONG AIRPORT TRIBUTARY
- E-2 EXPECTED EXTENT OF FLOODING ALONG BIG SLOUGH
- E-3 EXPECTED EXTENT OF FLOODING ALONG CLIFTY CREEK
- E-4 EXPECTED EXTENT OF FLOODING ALONG DENIOS CREEK
- E-5 EXPECTED EXTENT OF FLOODING ALONG DRIFTWOOD RIVER
- E-6 EXPECTED EXTENT OF FLOODING ALONG EAST FORK WHITE CREEK
- E-7 EXPECTED EXTENT OF FLOODING ALONG EAST FORK WHITE RIVER
- E-8 EXPECTED EXTENT OF FLOODING ALONG FLATROCK RIVER
- E-9 EXPECTED EXTENT OF FLOODING ALONG HAW CREEK
- E-10 EXPECTED EXTENT OF FLOODING ALONG OPPOSSUM CREEK
- E-11 EXPECTED EXTENT OF FLOODING ALONG SLOAN BRANCH
- E-12 EXPECTED EXTENT OF FLOODING ALONG WOLF CREEK
- E-13 RELATIONSHIP OF RIVER GAGE STAGE & ANTICIPATED OVERTOPPING OF MAJOR TRANSPORTAION ROUTES
- E-14 POTENTIAL EVACUATION GATHERING PLACES

EXHIBIT E-1: Expected Flood Depths for a 10% Annual Chance (10-Year) Flood

EXHIBIT E-2: Expected Flood Depths for a 2% Annual Chance (50-Year) Flood

EXHIBIT E-3: Expected Flood Depths for a 1% Annual Chance (100-Year) Flood

EXHIBIT E-4: Expected Flood Depths for a 0.2% Annual Chance (500-Year) Flood

APPENDIX E-1

EXPECTED EXTENT OF FLOODING ALONG AIRPORT TRIBUTARY

E-1 EXPECTED EXTENT OF FLOODING ALONG AIRPORT TRIBUTARY

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
Walesboro Airfield (1)	AT2	CR450 South between CR 125 West and SR 11	Up to over 2' flood depths on a reach of CR 450 South. Prevents access to at least 4 businesses. Shallow flooding begins at the 10-year flood level	
	AT3	CR 400 South just east of CR 50 West	Up to over 1' of flooding of a reach of CR 400 South. Prevents access to at least 3 sets of structures. Flooding begins above the 100-year flood event	
	AT4	former airport property bounded by Deaver Road, CR 50 West, CR 400 South, and CR 175 West	Significant flooding of potential development area. Average flood depths of 2'. Flooding of the area begins below the 10-year flood event	
	AT5	business in the northwest corner of the CR 50 West and CR 450 South intersection	Shallow flooding of entrance road, potentially up to 3' flood depths in parking areas as well as potential flooding of business. Flooding begins below the 10-year flood level	1 hazardous material facility
	AT6	business north of Airport Tributary in the northeast corner of the CR 175 W and CR 450 South intersection	Potential for over 4' of flooding of business buildings and parking as well as some flooding of road leading to business. Flooding begins below the 10-year flood level	1 hazardous material facility
	AT7	CR 175 West between CR 350 South and CF 450 South	Up to 3' flood depths on a reach of CR 175 West. Does not currently impact direct access to structures. Flood depths of up to a foot are still possible on the 10-year flood	
	Walesboro (2)	AT1	area bounded by Airport Tributary, railroad, and CR 450 South	4 structures with flood depths less than 2', 17 structures with flood depths over 2', flooding of access roads to over 6' as well as over 3' on CR 450 South leading to the entrance, one structure may be above flood elevations but would be surrounded by water. Some access road and potentially structure flooding is beginning at the 10-year flood level

APPENDIX E-2

EXPECTED EXTENT OF FLOODING ALONG BIG SLOUGH

E-2 EXPECTED EXTENT OF FLOODING ALONG BIG SLOUGH

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
CR 450 N	BS1	CR 450 N just east of US 31	Flooding from Big Slough of over 5' with flooding beginning below the 10-year level, no direct impact to access to structures	
CR 500 N	BS2	CR 500 north east of US 31	Flooding by more than 1' of water with overtopping beginning below the 10-year flood level of Big Slough, direct access to one farmstead is prevented by flood waters	
CR 550 N	BS3	North side of CR 550 North just east of US 31	Small portion of parking area in 500-year floodplain, one building and grain elevators located in Big Slough floodway	1 hazardous material facility

APPENDIX E-3

EXPECTED EXTENT OF FLOODING ALONG CLIFTY CREEK

E-3 EXPECTED EXTENT OF FLOODING ALONG CLIFTY CREEK

Neighborhood Reference	General Location	Map Identifier	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
Wehmeier/Columbus East (24)	Businesses along Repp Drive south of State Street (SR46)	CC1	Flooding up to 3 feet deep may occur at one building with flooding starting above the 50-year flood level. Parking lots may experience shallow flooding. Access roads may be flooded by over 1 foot of water (once flooding exceeds 100-year flood levels) preventing access to 9 businesses.	1 fire station
	Wehmeier Addition north and east of Marr Road and State Street (SR 46)	CC2	Flooding of 45 structures to depths less than 2' and 69 structures over 2', neighborhood roads are also flooded to depths up to 3', approximately 5 structures would be above flood waters but without access to and from the neighborhood, flooding begins below the 50-year level, 16 structures located in the floodway	
	Marr Road and Indiana Avenue north of State Street	CC3	Flooding of Indiana Avenue north of the softball diamonds begins below the 100-year event. Flooding of Marr Road begins above the 100-year event and reaches depths up to about 1'. Depths on Indiana Avenue reach 1 1/2 feet and prevent access to the buildings on Salzburg Boulevard (Steinhurst Manor Apartments). Flooding of Marr Road prevents access to the Columbus East High School from Marr Road but access from the north is still available.	
	A portion of the building complex on Salzburg Boulevard north of Indiana Avenue (Steinhurst Manor)	CC4	The northeast most parking lot is flooded by about a foot of water, access to the northwest parking is prevented by water up to almost 2' deep, access to the northwest parking is impacted above the 10-year flood, access to the northeast parking begins to be impacted at the 50-year flood	
	Columbus East High School	CC13	Flooding of a portion of the high school & parking areas with up to 3' flood depths is possible. Flooding begins above the 100-year flood as long as there are no culverts under Marr Road to transfer flood water from the east to the west side. Access to the flood-free portions of the school is only available from the north, protection has been constructed to above the 100-year flood	1 school

Neighborhood Reference	General Location	Map Identifier	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
McKinley Ave	McKinley Ave between Marr Road and Clifty Creek	CC5	A portion of this road is flooded up to over 3 feet between Marr Road and the set of 3 buildings that use this as the only access. Flooding begins above the 10-year flood level for both the road and the structures.	
Sandy Hook/Clifty Crossing (25)	Businesses just south of National Road between Clifty Creek and just west of 10 th Street	CC6	Parking lots are flooded by up to approximately 1 1/2 feet but buildings appear to be elevated above flood elevations. Parking lot flooding begins at about the 50-year flood level. Open ground between the businesses east of Taylor Road appears to be an important auxiliary path for flood waters to pass under National Road	
	National Road west of Taylor Road	CC7	About 1200' of the road just west of the intersection is flooded at depths up to about 2 1/2 feet preventing access to at least one business. Flooding begins above the 100-year flood level	
	Sandy Hook neighborhood bounded by Taylor Road, National Road, and Waycross Drive	CC8	Potential shallow depth flooding of about a dozen homes, significant street flooding depths up to 3' preventing access to and from about 50 homes, road flooding blocks one of the accesses to an assisted living facility, flooding of at least one business. Water overtops Taylor Road and begins flooding the area above the 100-year level flood, structure flooding is beginning at the 500-year flood level	1 child care facility
Regency Drive (28)	Hartford Place neighborhood bounded by Dawnshire Drive, Tally Road, Clifty Creek, and 25th Street	CC9	Up to 2' of flood depths possible in some streets limiting access to and from up to 50 homes. Flooding begins above the 50-year flood level of Clifty Creek, 1 or 2 homes may experience minor flooding	
CR 50 N	CR 50 North between CR 275 East and N Dellasburg Road	CC10	Flood depths over 4' on portions of the road. Flooding starts below the 10-year flood level. Access to a private drive for 3 residences is cut off starting above the 10-year flood level	
	Between Clifty Creek and 25th Street west of CR 500 East	CC11	2 structures are located in the floodway. An additional 4 are in the 100-year floodplain. Only 1 structure appears to be flooded by the 10-year flood.	
CR 500 E	CR 500 East between Clifty Creek and 25th Street	CC12	CR 500 East is flooded by up to 3 feet deep water, flooding begins above the 10-year flood level, no direct impact to access to structures	

APPENDIX E-4

EXPECTED EXTENT OF FLOODING ALONG DENIOS CREEK

E-4 EXPECTED EXTENT OF FLOODING ALONG DENIOS CREEK

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
Bethel Village (4)	DC1	Bethel Village neighborhood northwest of Deaver Road and SR 11	Over 100 structures with flood depths less than 2', 60 structures with flood depths over 2', flooding of almost all streets by up to approximately 4', flooding of several structures and inundation of the access into and out of the neighborhood occurs below the 10-year flood elevation, 6 structures in the floodway, various projects are being or have been considered/constructed to attempt to reduce flooding of the neighborhood. (This description applies to flooding from Denios Creek only. See WR8 for description of impacts when flooding source is White River)	
	DC2	Deaver Road west of SR 11	Overtopped by over 5 feet cutting off access to and from the neighborhood and a farmhouse to the north, flooding starts below the 10-year flood elevation, prevents as much access to surrounding properties as the flooding of the properties themselves (This description applies to flooding from Denios Creek only. See WR6 for description of impacts when flooding source is White River)	
SR 11 South (5)	DC3	Neighborhood along Dawson Street west of SR 11	Approximately 10 structures are located in the floodway, 18 structures are flooded by depths up to 2', 19 structures are flooded by water over 2' deep. Access to about all of the structures is prevented by road flooding up to almost 3', flooding begins at less than 10-year levels (This description applies to flooding from Denios Creek only. See WR11 for description of impacts when flooding source is White River)	
Shadow Creek Farms (6)	DC4 (also identified as OC2)	CR 150 West between CR 200 South and CR 300 South	Overtopped by over 1' of water cutting off access to 2 residences and potentially the east access to the subdivision north of Denios Creek (Shadow Creek Farms), shallow flooding occurs near the creek at the 10-year flood elevation. EFK White River flood waters come near to the road but do not appear to overtop it.	

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
	DC5 (also identified as OC3)	Shadow Creek Farms subdivision southwest of CR 200 South and CR 150 West along Shadow Creek Blvd	Existing structures appear to be built above the flood elevations. However, a short portion of Rolling Knoll Lane and portions of what looks like the early stages of construction for another street show flood depths of more than a foot. This, in combination with flooding of CR 150 West, would isolate about 25 existing homes and potentially more as the subdivision is developed. Flooding of the street does not start until levels greater than the 100-year.	
Access Roads	DC6	Access roads along I-65 between CR 200 South and CR 300 South	West side access road flooded by less than about 1' of water, flood-free to flood levels above the 100-year. East side access road flooded by up to more than 3' of water, minimal flooding occurs for the 10-year flood level alternative route exists	
CR 400 W	DC7	CR 400 West north of CR 250 South	Overtopped by up to about 2', does not prevent access to any structures, flooding starts below the 10-year flood elevation	
Carr Hill Road	DC8	Carr Hill Road east of CR 475 West	Overtopped by up to about 2' cutting off access from the west to one residence. Road overtopping starts below the 10-year flood elevation	
Goeller Road	DC9	Goeller Road just east of CR 475 West	Road is overtopped by about 1/2 foot of water but does not cut off direct access to any structures. Overtopping starts above the 50-year flood levels.	

APPENDIX E-5

EXPECTED EXTENT OF FLOODING ALONG DRIFTWOOD RIVER

E-5 EXPECTED EXTENT OF FLOODING ALONG DRIFTWOOD RIVER

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
Front Door East/ Jonathan Moore Pike (10)	DW1	SR46 (Jonathan Moore Pike) east of I-65 to EFK White River	The road is overtopped by up to 6' of water, blocks access to 5 or more businesses and other structures east of I-65, prevents access to 3 hazardous material facilities, flooding of the edge of SR 46 begins at about the 10-year flood level.	
	DW3	Along Jonathan Moore Pike and Merchants Mile east of I-65	Approximately 17 structures are flooded to depths less than 2' and 5 greater than 2'. Jonathan Moore Pike floods to over 5' of depth. Parking lots are flooded to depths of around 2'. Flooding of Jonathan Moore Pike starts below the 10-year flood levels as does access road and potentially some structure flooding, 5 structures are in the floodway	3 hazardous material facilities
Front Door West/ Westhill (11)	DW4	North and south of Jonathan Moore Pike west of I-65	Approximately 15 structures are flooded to depths of less than 2' while 6 are greater than 2'. Jonathan Moore Pike floods to about 3' of depth and access road flooding occurs and may cause 2-5 buildings to be isolated by flood waters. Access to buildings further south is flooded but other flood-free access exists from Jonathan Moore Pike to the west. Flooding of Jonathan Moore Pike starts below the 10-year flood levels as does access road and some structure flooding.	3 hazardous material facilities
	DW5	Carlos Folger Drive between CR 315 West and Jonathan Moore Pike	Shallow flooding begins below the 10-year flood elevation reaching almost 5' of depth during the 50-year flood. Alternative access to structures along the road exists.	
	DW6	Between Jonathan Moore Pike and Carlos Folger Drive along CR 325 West	Approximately 2 structures are flooded up to more than 1', Carlos Folger Drive and CR 325 West are flooded by up to 4' of water cutting off access to SR 46 from the north, flooding of the road begins at less than the 10-year flood level while flooding of the structures may begin at the 10-year level, alternate access to structures exists	water treatment plant office
	DW7	Not used		

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
CR 325 W (12)	DW8	CR 325 West between Lowell Road and Carlos Folger Drive	Portions of this stretch of road are flooded by more than 4' of water cutting off direct access to over 10 structures along the road. Flooding of portions of the road begin below the 10-year flood level, 4 properties with structures have been bought out	
Lowell Road (13)	DW9	Vicinity of the Lowell Road and CR 250 West intersection	At a stage of 17 feet (approximately the 50-year flood) portions of both roads are flooded to over 1' deep cutting off access to a few structures north of Lowell Road and others west of CR 250 West and preventing access to the west side of Driftwood River along Lowell Road. Flooding begins between the stages of 15 and 16' (approximately the 10 year) as measured at the Driftwood at Edinburg USGS gage.	
Tellman Camp Road (15)	DW2	Along Tellman Road between CR 250 West and Indianapolis Road	Approximately 30 structures are inundated to levels greater than 2', approximately 4 structures are inundated to levels less than 2'. Tellman Road is flooded by over 10 feet of water cutting off access to approximately 50 structures, flooding of most of the structures and access to the structures begins below the 10-year flood level, 17 structures in the floodway	
	DW10	Not used		
CR 330 W	DW11	Along CR 330 West from approximately 2,000 to 3,000 feet south of CR 450 North	Flooding of the road begins at about stage 16 as recorded at the USGS gage on Driftwood River at Edinburg cutting off access from the south to 5 structures on the east side of the road. Access to the north remains open at a stage of 17 feet (approximate 50-year flood level)	
CR 250 W	DW12	Along CR 250 West north of CR 500 North	Flooding up to about 1' deep of a short section of road begins above stage 16 (over the 10 year) as recorded at the USGS gage at Edinburg, no direct access to structures is impacted	

APPENDIX E-6

EXPECTED EXTENT OF FLOODING ALONG EAST FORK WHITE CREEK

E-6 EXPECTED EXTENT OF FLOODING ALONG EAST FORK WHITE CREEK

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
CR 600 S	EFKWC1	CR 600 South just east of CR 400 West	Up to approximately 1 1/2' foot of flooding, flooding begins near the 10-year flood level, does not impact direct access to structures	
CR 400 W	EFKWC2	CR 400W between CR 550 South & CR 600 S	Up to approximately 1/2' of flooding, flooding begins at near 50-year flood levels, does not impact direct access to structures	
CR 550 S	EFKWC3	CR 550 South just west of CR 400 West	Up to approximately 3' of flooding beginning below the 10-year flood level. Impacts access to 3-4 structures	
SR 58	EFKWC4	SR 58 east of CR 500 West	Flood depths over 2' beginning below the 10-year level, preventing access to at least one structure	
CR 350 S	EFKWC5	CR 350 South (Deaver Road) east of CR 500 West	About 2' of flooding, beginning below the 10-year level, prevents direct access to 1 structure	

APPENDIX E-7

EXPECTED EXTENT OF FLOODING ALONG EAST FORK WHITE RIVER

E-7 EXPECTED EXTENT OF FLOODING ALONG EAST FORK WHITE RIVER

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
Walesboro (2)	WR2	West of SR 11 between CR 400 South and Southern Crossing	Approximately 13 structures in the 500-year floodplain of EFK White River, flooding may limit access to some of the structures	
	WR3	East of SR 11 north of CR 400 South for 600 feet	Approximately 1 structure in the floodway, 5 more in the 100-year floodplain and 3 more in the 500-year floodplain, access to these structures may be prevented by floodwaters	
Southern Crossing (3)	WR1	Southern Crossing of White River	Approximately 3' deep flooding beginning below the 10-year flood level, flooding of the road approaches does not appear to directly impact the entrance to structures	
Bethel Village (4)	WR6	Deaver Road west of SR 11	Inundated by up to almost 6' but flooding does not start until over the 10-year flood event, prevents as much access to surrounding properties as the flooding of the properties themselves. (This description applies to flooding from East Fork White River only. See DC2 for description of impacts when flooding source is Denios Creek.)	
	WR8	Bethel Village neighborhood northwest of Deaver Road and SR 11	80 structures with flood depths less than 2', 60 structures with flood depths over 2', flooding of almost all streets by up to approximately 4', flooding of several structures and inundation of the access into and out of the neighborhood occurs above the 10-year flood elevation. (This description applies to flooding from East Fork White River only. See DC1 for description of impacts when flooding source is Denios Creek.)	
	WR5	Not used		
SR 11 South (5)	WR4	East of SR 11 near Deaver Road	Approximately 9 structures flooded to depths >2' and 0 structures flooded to depths <2', access is prevented by flooding of SR 11, flooding begins at less than 10-year levels, 6 structures are in the floodway	
	WR7	SR 11 approximately 1500 feet north and south of Deaver Road	Flood depths of over 3' beginning near the 50-year level, prevents direct access to 2 farmsteads	

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
SR 11 South (5) cont.	WR9	East of SR 11 near SR11 crossing of Denois Creek	Approximately 2 structures flooded to depths <2', access is prevented by flooding of SR 11, flooding of structures begins at about the 10-year level, road flooding begins above the 10-year levels	
	WR10	Blessing Road east of SR 11	Flood depths of about 6' prevent access to approximately 6 structures starting at below 10-year levels	
	WR11	Neighborhood along Dawson Street west of SR 11	About 20 structures are flooded to depths of about 2', another almost 12 structures are isolated due to flood waters on Dawson Street up to almost 2' deep, flooding begins above the 50-year level. (This description applies to flooding from East Fork White River only. See DC3 for description of impacts when flooding source is Denois Creek.)	
Huffman Drive/ WWTP (8)	WR15	SR11, Huffman Drive, & WWTP access road just north and south of Denois Creek under SR 11	Flooding of a portion of SR 11 (2' deep), Huffman Drive (5' deep) and WWTP access road (1' deep), flooding begins on each road below the 10-year flood level, access to a few structures that are above flood levels is prevented (including Southside elementary School), minor flooding of about 5 structures	Waste water treatment plant, Southside Elementary School access
	WR16	Not used		
Garden City (9)	WR17	Kenmill Street area east of RR between Garden Street and CR 200 South	Approximately 38 structures flooded to depths less than 2' and 53 structures flooded to depths over 2', although some structures are also above the 500-year flood elevations, access to most of these structures (including Southside Elementary School) is prevented by flooding of SR 11, minor flooding begins at about the 10-year level, 2 structures are located in the floodway	1 hazardous material facility, mobile home park, Southside Elementary School access
	WR18	Garden City east of RR between SR 46 and Garden Street	Approximately 13 structures flooded to depths less than 2' and 8 structures flooded to depths over 2', although some structures are also above the 500-year flood elevations, access to most of these structures is prevented by flooding of SR 11, flooding of the road and a few structures begins below the 10-year level, 4 structures are in the floodway	

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
	WR19	Garden Street west of SR 11	While structures in this reach appear to be above the 500-year flood levels, flooding of Garden Street up to about 4' begins below the 10-year flood level preventing access to and from approximately 16 structures	
	WR20	Not used		
Gladstone Avenue (23)	WR12	Gladstone Avenue south of Clifty Creek	Over 6' flood depths preventing access to approximately 3 sets of structures, up to 3' depths for Clifty Creek flooding, flooding from EFK White River or from Clifty Creek begins at less than 10-year flood levels	
	WR13	Gladstone Avenue between the RR and Clifty Creek	Road overtops by up to about 7', prevents access to a couple sets of structures when White River floods, a few additional structures are cut off when Clifty Creek floods, flooding begins at less than 10-year levels	
Water Street (29)	WR23	South of 1st Street between Lafayette Avenue & Brown Street	Access roads flooded by up to over 7' of water preventing access to 1 or 2 businesses, structures appear to be near or above flood elevations, road flooding begins at less than 10-year flood levels	
Mariah/ Reo St (30)	WR21	Commercial and residential area east of Haw Creek, south of State Street and north of the RR	Approximately 12 structures flooded to depths less than 2' and 10 structures flooded to depths over 2', flooding may occur from water backing up Haw Creek and overtopping the berm along the commercial property or EFK White River water flooding over the RR, overtopping of these features occurs around the 50-year flood level of EFK White River. (This description applies to flooding from East Fork White River only. See HC13 for description of impacts when flooding source is Haw Creek.)	1 hazardous material facility
Beatty Lane	WR14	Beatty Lane south of RR	Flood depths over 7 feet preventing entrance to one farmstead	
	WR22	Not used		

APPENDIX E-8

EXPECTED EXTENT OF FLOODING ALONG FLATROCK RIVER

E-8 EXPECTED EXTENT OF FLOODING ALONG FLATROCK RIVER

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
Mill Race Park (14)	FR1	Between 5th and 11th Streets and Flatrock River and Jackson Street	1 or 2 structures flooded by less than 2' of water with access blocked for those structures and potentially 5 additional structures, road and minor structure flooding begins at about the 50-year level. Potential for flooding of Cummins COB loading dock at 500-year level.	1 hazardous material facility
Indianapolis Road (16)	FR3	Along Indianapolis Road from about 3000' north to 2000' south of CR 100 N	Flood depths along Indianapolis Road are over 3', 1 structure along this reach of the road is flooded by less than 2' of water while 23 are flooded by over 2', road and structure flooding begins below the 50-year flood level, direct access to more than 10 businesses is blocked by flood waters, 17 structures are located in the floodway	
	FR4	CR 100 North from Indianapolis Road to CR 200 West	Flood depths along this road segment are over 6', cutting off access to at least one set of buildings, flooding starts below the 10-year flood level	
	FR7	West of Indianapolis Road roughly between Brian Drive and Arcadia Drive	Road flooding at over 3' depth preventing access to several businesses that appear to be above the 500-year flood level, road flooding (including Indianapolis Road) begins around the 10-year level	1 hazardous material facility
Washington St (17)	FR2a	Area from Washington Street to Flatrock River and between 12 th Street and Newsome Avenue	45 structures with flood depths less than 2', 90 structures with flood depths over 2', flooding of streets to 3' or more of water, flooding of several structures and inundation of the access into and out of the neighborhood begins below the 50-year flood elevation, RR embankment provides some protection between the 10- and 50-year floods for the southern portion of the area	
Noblitt Falls (18)	FR2b	Noblitt Falls neighborhood west of Washington Street and Newsome Avenue to 23 rd Street	20 structures with flood depths less than 2', 35 structures with flood depths over 2', flooding of streets to 3' or more of water, flooding of several structures and inundation of the access into and out of the neighborhood begins at about the 50-year flood elevation when the lagoon berm is overtopped or water flows over a low point in Newsome Avenue near its intersection with Lawton Avenue, 40 structures located in the floodway	
Riverside Drive South (19)	FR6	Riverside Drive between 23rd and 28th Streets	Flooding of auxiliary access to some structures may occur at less than the 10-year flood level, all structures appear to be above 500-year flood levels and have access to the east	

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
US 31 (20)	FR10	Along National Road between Washington Street and 2000' east of Indianapolis Road	Minor flooding possible at the 500-year flood level, access to adjoining properties becomes flood-free before internal access within those properties, impacts access to 2 hazardous material facilities	
Long Road (22), Commerce Park (21)	FR8	Northeast, southeast, and southwest quadrant of National Road and Indianapolis Road intersection	Potential flooding less than 2' deep on 5 structures with street flooding over 3' deep preventing access, some flooding begins around the 50-year level, 20 structures in the floodway	2 hazardous material facilities
Long Road (22)	FR12	North and east of Long Road and Lowell Road intersection	3 structures with flood depths less than 2', parking lot flooding begins at 50-year level with potential flooding of structures at 100-year level, at 500-year access to another group of structures is flooded	
	FR13	Along east side of Indianapolis Road for 1800' south of Long Road	Parking lot and access road flooding up to about 1' which may block access to 2 businesses starting above the 100-year flood level	
Riverside Drive North (45)	FR11	Riverside Drive between Rocky Ford Road and Washington Street	3 structures flooded by less than 2', 3 structures flooded by more than 2', flooding begins above the 10-year flood level, auxiliary access is available for all but 2 structures via alley east of the structures	
CR 200 W	FR5	CR 200 West from CR 100 North to approximately 3,500 feet north	Flooding of road up to about 2' blocks access for 2 sets of structures, flooding begins at less than the 500-year level	
Princeton Park Drive	FR9	Along Princeton Park Drive south of Heathrow Drive	Some road flooding less than 1/2' except for in front of one residence where flood depths are over 3', structure may or may not be above the 500-year flood elevation, access to that one structure may be blocked at less than 50-year flood levels	
Riverside Drive	FR14	Riverside Drive north of North Street	Road flood depths up to about 1' blocking access to 5 or 6 residences beginning above 100-year flood levels	
CR 400 N	FR15	CR 400 North between US 31 & River Road	Flood depths of over 4' beginning below the 10-year level, no direct impact to access to structures	
CR 550 N	FR16	CR 550 North between Flatrock River and US 31	Flood depths on road over 7' preventing direct access to about 3 parcels beginning below the 10-year flood elevation	

APPENDIX E-9

EXPECTED EXTENT OF FLOODING ALONG HAW CREEK

E-9 EXPECTED EXTENT OF FLOODING ALONG HAW CREEK

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
Mariah/ Reo St (30)	HC13	Commercial and residential area east of Haw Creek, south of State Street and north of the RR	Approximately 17 structures flooded to depths less than 2' and 9 structures flooded to depths over 2', flooding may occur from Haw Creek water overtopping the berm along the commercial property or EFK White River water flooding over the RR, overtopping of these features can occur around the 50-year flood level of EFK White River or the 10-year level of Haw Creek	1 hazardous material facility
CEP/ 2nd St (31)	HC3	Central Avenue between 3rd Street and 7th Street	Depths of over 1' with flooding beginning above the 100-year level, flooding eliminates one access route for the business	
	HC4	Cummins Engine Plant north of 3rd Street and Central Avenue	Flooding of parking and building begins at levels near the 100 year, floodwall is under construction to protect structure from flooding	1 hazardous material facility
	HC8	West side of Haw Creek between 3rd Street and the RR	Fill has been placed south of 2nd St so depths in this portion are unknown. North of 2nd Street flood depths are up to 6 feet, 5 buildings are flooded to depths over 2', 2 buildings are flooded to depths less than 2', 3rd Street flood depths are over 4' while 2nd Street depths are a little over 1', flooding of the area north of 2nd St begins above the 100-year flood	1 hazardous material facility
Tech Center/ Pleasant Grove (32)	HC1	Cummins, Inc property	levee/floodwall system has been built to protect Cummins Technology Center structures from flooding, Child Care Center begins flooding just below the 100-year flood level	1 hazardous material facility (protected), Cummins Child Care facility
	HC2	Pleasant Grove neighborhood between State Street and 7th Street between Pleasant Grove and Cherry Street	Flood depths up to over 7' for structures and streets, flooding begins below the 50-year flood level, alternate flood-free access is available, several structures have been bought out	

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
10th / Central (33)	HC5	Neighborhood between Haw Creek and Cottage Avenue and between 7th and 12th Streets	68 structures with flood depths less than 2', 104 structures with flood depths over 2', structure flooding may begin below 10-year level, significant street flooding with depths over 6', some street flooding at the 10-year level, access is cut off to approximately 12 structures that appear to be flood-free , 2 structures have been bought out	
	HC6	8th Street between Haw Creek and Central Avenue	Over 3' depth, flooding begins below the 50-year flood level, access is prevented to already flooded areas	
	HC7	10th Street between Haw Creek and Hutchins Avenue	Street flooding up to 6', flooding begins below the 10-year level, access is prevented to already flooded areas	
17th/ Keller (34)	HC12	Neighborhood between 17th and 20th Streets and Keller Avenue to Haw Creek Avenue	Approximately 36 structures with less than 2' flood depths, 12 structures with more than 2' flood depths, street flooding up to over 4' of water, street flooding begins at about the 50-year level	
CRH (35)	HC10	Columbus Regional Hospital east of Haw Creek along 17th Street	Flooding of parking areas near the creek with over 2' of water along with building flooding, parking lot flooding begins below the 50-year level, building flooding via the loading dock would begin about the 100-year level, hospital has constructed flood control measures to protect against structure flooding	medical facility
Midway (36)	HC11	North of Columbus Regional Hospital to 24th Street between Haw Creek and Midway Street	Flooding of parking lots to depths over 5', 19 structures with flood depths less than 2', 10 structures with flood depths over 2', street flooding generally about 2' deep, flooding of parking lots starts below the 10-year event, structure flooding begins below the 100-year level, alternate access to non- flooded structures (except 2) is maintained, impacts to Columbus Health and Rehabilitation Center begin about the 100-year event level	Columbus Health and Rehabilitation Center, school

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
Everroad Park East (37)	HC17	Everroad Park East along Griffa Avenue north of 25th Street	In the southern portion of the area, flooding of structures begins at about the 100-year level, shallow flooding of about 10 residential structures and over 2' for a business along with street flooding of up to 1' preventing direct access to about 16 residences. In the northern part of the area, flooding begins just above the 10-year flood level, 30 structures are flooded to depths over 2' and about 15 are flooded to depths less than 2', access to about 3 structures is prevented by flood waters	
Everroad Park West/ Eastbrook (38)	HC14	Southwest corner of the 25th Street and National Road intersection (Eastbrook Plaza)	Approximately 2' deep flood waters in strip mall structures and parking areas beginning around the 50-year flood level	
	HC15	National Road west of Haw Creek to Herman Darlage Drive	Flood depths of up to about 3', flooding begins below the 100-year flood level, flooding limits access to neighborhood to the north and a few businesses along the road	
	HC16	Everroad Park West neighborhood west of Haw Creek between National Road and 31st Street	Street flooding begins below the 50-year level making about 10 structures inaccessible, structure flooding beginnings at or above 50-year level, 112 structures flooded by less than 2', 67 structures flooded by depths over 2', streets flooded by over 2' of water	
Cedar Ridge (39)	HC19	Between Middle road and Trestle Drive between Cedar Crest Drive and Cedar Ridge Drive	Street flooding of over 1' prevents access to about 25 structures, flooding begins above the 100-year flood	
	HC20	Trestle Drive south of Rocky Ford Road	Flood depths over 1' prevent access to one structure and cut off 1 of the accesses to a neighborhood on its west south of Rocky Ford Road, flooding begins above the 100-year level	
Windsor Place/ Hillcrest (40)	HC18	Windsor Place/Hillcrest neighborhood east of Haw Creek between 30th Street and Rocky Ford Road	Over 70 structures flooded by less than 2' of water, 15 structures flooded by over 2', streets flooded by over 2' of water, access prevented to even more structures, structure and street flooding begins at the 50-year flood level	

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
Northbrook/ Candlelight (41)	HC22	Candlelight/Northbrook neighborhood between Candlelight Drive and Haw Creek and Northbrook Drive and Rocky Ford Road	138 houses and 154 mobile homes flooded by less than 2', 1 house and 80 mobile homes flooded by over 2', flooding begins below the 50-year flood level	mobile home park
	HC23	Not used		
Sycamore Bend/Arrowood (42)	HC24	Arrowood/Willowwood neighborhood north of Rocky Ford Road and west of Indianwood Drive	Minor street flooding begins below the 50-year flood level, approximately 20 structures are flooded by less than 2' of water, streets are flooded by approximately 2' of water making over 50 structures inaccessible even though some are above flood waters	
	HC25	Marr Road and Sawin Drive near their intersection	Flood depths over 2' beginning below the 50-year level, no impact on direct access to structures	
	HC26	Not used		
Marr Road (43)	HC27	Along Marr Road from CR400 North to about Sawin Drive	Depths over 4' preventing direct access to one or two farmsteads, flooding begins east of Haw Creek at less than the 10-year level	
	HC28	Not used		
	HC29	Not used		
North Haw Creek (44)	HC30	CR 400 North east of Marr Road	Flood depths up to 5' preventing direct access to 2 farmsteads, flooding begins below the 10-year level	
	HC31	Marr Road between CR 550 North and CR450 North	Flood depths over 2' with minor flooding starting at the 10-year level, direct access prevented to 2 farmsteads	
	HC32	Along Talley Road south of CR 450 North	Flood depths over 1' beginning below the 50-year level, does not impact direct access to structures	
	HC33	CR 450 North east of Marr Road	Flood depths over 4' preventing direct access to 3 farmsteads, flooding begins below the 10-year level	
	HC34	CR 250 East north of CR 450 North	Flood depths over 3' preventing direct access to 2-3 farmsteads, flooding begins below the 10-year level	
	HC35	CR 500 North east of CR 150 East	Flood depths over 5' with flooding starting below the 10-year level, direct access prevented to 1 farmstead	

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
Ravenswood Drive	HC9	Along Ravenswood Drive between 15th and 17th Streets	Minor flooding possible for 3 structures, potential street flooding up to almost 1' would block access to about 7 residences, flooding begins at depths over the 100-year flood level	
Rocky Ford	HC21	Rocky Ford Road between Candlelight Drive and Taylor Road	Flooding east of Haw Creek to 1' depth of water preventing access to about 15 structures, flooding west of Haw Creek to depths of over 4' cutting off 1 of the accesses to the mobile home park on the north and the neighborhood to the south, prevents access to one business, shallow flooding begins at the 10-year level	

APPENDIX E-10

EXPECTED EXTENT OF FLOODING ALONG OPOSSUM CREEK

E-10 EXPECTED EXTENT OF FLOODING ALONG OPOSSUM CREEK

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
	OC1	North of CR 230 South & east of CR 150 West	Flooding of 2 structures and their access with over 2' of water, flooding begins below the 10-year level of Opossum Creek and the 50-year level of EFK White River (access flooding from EFK White River begins at slightly lower level)	
Shadow Creek Farms (6)	OC2 (also identified as DC4)	CR 150 West between CR 200 South and CR 300 South	Overtopped by over 1' of water cutting off access to 2 residences and potentially the east access to the subdivision north of Denios Creek (Shadow Creek Farms), shallow flooding occurs near the creek at the 10-year flood elevation. EFK White River flood waters come near to the road but do not appear to overtop it.	
	OC3 (also identified as DC5)	Shadow Creek Farms subdivision southwest of CR 200 South and CR 150 West along Shadow Creek Blvd	Existing structures appear to be built above the flood elevations. However, a short portion of Rolling Knoll Lane and portions of what looks like the early stages of construction for another street show flood depths of more than a foot. This, in combination with flooding of CR 150 West, would isolate about 25 existing homes and potentially more as the subdivision is developed. Flooding of the street does not start until levels greater than the 100 year.	
CR 200 S (7)	OC4	CR 200 South and CR150 West south and west of their intersection	CR 150 West is flooded up to 3' from Opossum Creek and up to about 2' from EFK White River, CR 200 South is flooded by up to 1/2' water from Opossum Creek and no flooding from EFK White River, flooding of CR 150 West here in combination with further south prevents access to about 10 residences, flooding along CR 200 South prevents access to 1 residence and to Southside Elementary School from the west, flooding of CR 150 West begins from EFK White River at the 50-year level and from Opossum Creek below the 10-year level, flooding of CR 200 South begins at the 50-year level	Southside Elementary School access

APPENDIX E-11

EXPECTED EXTENT OF FLOODING ALONG SLOAN BRANCH

E-11 EXPECTED EXTENT OF FLOODING ALONG SLOAN BRANCH

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
Madison/ Grant/ Flintwood (26)	SB2	Talley Road and Valley Forge Avenue north of 25th Street	Street flood depths over 1' preventing access to approximately 20 residences along these road segments, flooding begins at about the 10-year level	
	SB3	Neighborhood north of 25th Street between Flintwood Drive and Talley Road	Approximately 64 structures flooded to depths less than 2', 2 structures flooded by over 2' of water, street flooding up to 2' in the neighborhood and up to almost 1 foot along 25th Street preventing access to over 230 structures, flooding of 1-2 structures may begin at the 10-year level, additional structure and street flooding begins below the 50-year level, significant areas plus 25th Street are affected by the 100-year level, access to the Lutheran Home is impacted above the 50-year flood level	1 hazardous material facility, medical facility, school, Lutheran Home
Eastridge Manor (27)	SB4	Eastridge Manor neighborhood south of Rocky Ford Road between Talley Road and Virginia Street	Approximately 26 structures flooded to depths less than 2', 5 structures flooded to depths over 2', access is prevented to most structures along Elizabeth Street, Rocky Ford Road is flooded by up to 2', minor flooding of structures, Elizabeth Street, and Rocky Ford Road occurs at the 10-year level	
25th St & CR 350 E	SB1	North and east of intersection of 25th Street and Bonnell Road	Flooding of about 1/2' on 25th Street and up to 2' on Bonnell Road, minor flooding of Bonnell Road begins near the 10-year level, flooding of 25th Street begins above the 100 year, alternate access to structures is available	
Talley Road	SB5	Talley Road south of Sawin Drive	6 structures flooded to depths less than 2', 2 structures flooded to depths over 2', Talley Road flood depths near 4' prevent access to flooded structures, minor flooding begins near the 10-year level	
CR 350 N	SB6	CR 350 North east of Talley Road	Road flooding over 1' deep, does not impact direct access to any structures, minor flooding begins at 10-year level	

APPENDIX E-12

EXPECTED EXTENT OF FLOODING ALONG WOLF CREEK

E-12 EXPECTED EXTENT OF FLOODING ALONG WOLF CREEK

Neighborhood Reference	Map Identifier	General Location	Description of Flood Impacts at 500-Year Flood Levels and Frequency at Which Impacts Begin	Critical Facilities
CR 500 W	WC1	CR 500 West north of SR 46	Road flood depths over 1', does not block direct access to any structures, minor flooding begins at the 10-year level	
CR 580 W	WC2	CR 580 West between Old Nashville Road and CR 50 North	Road flood depths up to 1/2', does not prevent direct access to any structures, flooding begins above the 100-year level	

APPENDIX E-13

RELATIONSHIP OF RIVER GAGE STAGE & ANTICIPATED OVERTOPPING OF MAJOR TRANSPORTATION ROUTES

APPENDIX E-14

POTENTIAL EVACUATION GATHERING PLACES

E-14 POTENTIAL EVACUATION GATHERING PLACES

Potential Evacuation Gathering Places

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The following represents potential gathering places where residents evacuating with very short notice can gather as a group to await transportation to a more permanent shelter location. Flooding conditions can vary greatly for each specific flood event. When needed, specific gathering places shall be determined by the FREP Coordinators in coordination with the American Red Cross. Gathering places are needed only when flooding is occurring or imminent and people are escaping on foot with very little advance warning. Gathering places should be coordinated, as possible, with the American Red Cross comfort stations and/or shelters. Evacuations occurring in advance of flooding should direct evacuees to the American Red Cross shelters or designated comfort stations (depending on the expected duration and severity of the flooding).

Neighborhood or Area	Gathering Place Location Options		
	500-year Flood Safe (for use with inclement weather)	500-year Flood Safe (for use with favorable weather)	Lesser Flood Alternate* (for use with inclement weather)
(1) Walesboro Airfield	Columbus Fire Station #6	Columbus Fire Station #6	Jonesville Fire Department
(2) Walesboro	Columbus Fire Station #6	Bartholomew County Landfill	Jonesville Fire Department
(3) Southern Crossing	Not Applicable (roadway only)		
(4) Bethel Village	Bartholomew County REMC Building	Bartholomew County REMC Building	Bethel Baptist Church
(5) State Road 11 South	New Life Baptist Church		
(6) Shadow Creek Farms	Shadow Creek Farms Clubhouse	Shadow Creek Farms Clubhouse	
(7) County Road 200 South	County Fairgrounds	County Fairgrounds	
(8) Huffman Drive/WWTP	County Fairgrounds	County Fairgrounds	Columbus Waste Water Plant
(9) Garden City	Garden City Mobile Home Park	Garden City Mobile Home Park	
(10) Front Door East	Charwood	Charwood	Menards
(11) Front Door West/Westhill	Riverstone Apartments	Riverstone Apartments	INDOT Garage
(12) 325 West	Not Applicable (roadway only)		
(13) Lowell Road	Not Applicable (roadway only)		
(14) Mill Race Park	Not Applicable (park only)		
(15) Tellman Camp Road	As Needed (seasonal residences)		

* inclement weather locations closer to the affected area that may be appropriate for a less than a 500-year flood event

Potential Evacuation Gathering Places

Page 2 of 3

Neighborhood or Area	Gathering Place Location Options		
	500-year Flood Safe (for use with inclement weather)	500-year Flood Safe (for use with favorable weather)	Lesser Flood Alternate* (for use with inclement weather)
(16) Indianapolis Road	Lakeview Church of Christ	Lakeview Church of Christ	Any Area Manufacturing Facility
(17) Washington Street	Donner Park	Corner of 15th & Washington Street	
(18) Noblitt Falls	Donner Park	Corner of 20th & Washington Street	
(19) Riverside Drive South	Not Applicable (roadway only)		
(20) US 31	Not Applicable (roadway only)		
(21) Commerce Park	Lakeview Church of Christ	US 31 Railroad Bridge	
(22) Long Road	Bethel Wesleyan Church	Bethel Wesleyan Church	
(23) Gladstone Avenue	Not Applicable (roadway only)		
(24) Wehmeier/Columbus East	East Columbus Christian Church	Corner of US 31 & Fairview Drive	Columbus East High School
(25) Sandy Hook/Clifty Crossing	Four Seasons	Taylor Road & Lakeside Drive	
(26) Madison/Grant/Flintwood (north of Yellowwood Dr.)	Richards Elementary School	Corner of Chapel & Flintwood Drive	
(26) Madison/Grant/Flintwood (south of Yellowwood Dr.)	Columbus Fire Station #4	Columbus Fire Station #4	Flintwood Wesleyan Church
(27) Eastridge Manor	Calvary Church of the Nazarene	Calvary Church of the Nazarene	
(28) Regency Drive	Smith Elementary School	Corner of Talley Rd. & Kennesaw Tr.	
(29) Water Street	Not Applicable (roadway only)		
(30) Mariah/Reo	Bartholomew County Annex	Corner of State & Hinman Streets	

* inclement weather locations closer to the affected area that may be appropriate for a less than a 500-year flood event

Potential Evacuation Gathering Places

Page 3 of 3

Neighborhood or Area	Gathering Place Location Options		
	500-year Flood Safe (for use with inclement weather)	500-year Flood Safe (for use with favorable weather)	Lesser Flood Alternate* (for use with inclement weather)
(31) CEP/Second Street	St. Peters Church	Corner of Sycamore & 3rd Streets	
(32) Tech Center/Pleasant Grove	Foundation for Youth	Corner of Pleasant Grove & McKinley	
(33) 10th and Central	United Way Center	United Way Center	
(34) 17th & Keller	Columbus New Tech High School	Columbus New Tech High School	
(35) CRH	Not Applicable (floodwall protected)		
(36) Midway	Columbus Health & Rehab	Columbus Health & Rehab	
(37) Everroad Park East	Church of the Latter Day Saints	Corner of 30th St. & Marr Rd.	
(38) Everroad Park West	Total Fitness	Corner of US 31 & Brentwood Drive	
(39) Cedar Ridge	Sandcrest Medical Building	Corner of Middle Rd. & Cedar Crest Dr.	
(40) Windsor Place/Hillcrest	St. John's Lodge	Corner of Richland & Briar Drives	
(41) Northbrook	Airport Terminal	Corner of Middle Rd. & Cessna Dr.	
(41) Candlelight	Candlelight Club House	Candlelight Club House	
(42) Sycamore Bend/Arrowood	Rocky Ford Free Methodist Church	Rocky Ford Free Methodist Church	
(43) Marr Road	Not Applicable (roadway only)		
(44) North Haw Creek	Not Applicable (roadway only)		
(45) North Riverside Drive	Not Applicable (roadway only)		

* inclement weather locations closer to the affected area that may be appropriate for a less than a 500-year flood event

APPENDIX F

POST-FLOOD DAMAGE ASSESSMENT & DATA COLLECTION PROTOCOLS

- F-1 SUMMARY OF POST-FLOOD DAMAGE ASSESSMENT
- F-2 POST-FLOOD DAMAGE FLOW CHART
- F-3 DATA COLLECTION PROTOCOL

APPENDIX F-1

SUMMARY OF POST-FLOOD DAMAGE ASSESSMENT

F-1 SUMMARY OF POST-FLOOD DAMAGE ASSESSMENT

1. EVALUATE DAMAGE TO STRUCTURES

- EMA – conduct initial assessment using Red Cross form to determine if structure is “Destroyed”, “Major Damage”, “Minor Damage” or “Affected”
- EMA – coordinate with Red Cross, IDHS and FEMA on post flood damage assessments for larger flood events
- EMA - contact IDHS to see if anyone has submitted an online form reporting damage or losses
- EMA – leave a door hanger that an initial damage assessment has been done. Hanger should include contact information regarding permits
- EMA – create database and provides it to City (Planning)

2. IDENTIFY DAMAGE AREAS IN SFHA

- City (Planning) – use floodplain maps to identify “Destroyed”, “Major Damage”, “Minor Damage” (excludes Affected) structures in the SFHA
- City (Planning) – update database with worksheet data

3. DISTRIBUTE OUTREACH MATERIALS

- City (Code Enforcement & Planning) – distribute information using the local media, flyers posted at shelters, churches, city offices, city webpage, E911 mass notification system, etc. with policies and procedures for repairs, a checklist, and contact information for building permits

4. REVIEW PERMIT APPLICATION & VERIFY SFHA STATUS

- Owner – obtain an estimate to repair to pre-damaged condition (including cost of materials, labor, clean-up, debris removal)
- City (Planning) – on a case-by-case basis, use maps to verify the floodplain status of structures provided by owner (refer to IDNR for all floodway and non-delineated floodplain locations)
- City (Code Enforcement) – if structure is not in the SFHA, review permit application and proceed to Step 6

5. COST ESTIMATE TO REPAIR DAMAGE (for structures in the SFHA)

- City (Code Enforcement) – determine assessed value of pre-damaged structure
- City (Code Enforcement) – determine if there is cumulative damage resulting from past flood damage
- City (Code Enforcement) – update database to include cost to repair, assessed value, and cumulated damage amount (if applicable)

6. ISSUE LOCAL PERMITS

- City (Code Enforcement) – issue local permits for repairs

7. INSPECT REPAIRS & DOCUMENT DAMAGE

- City (Code Enforcement) – conduct inspections of repairs
- City (Code Enforcement) – update database with list of permits obtained and work completed
- City (Planning) – update database to document Repetitive Loss status

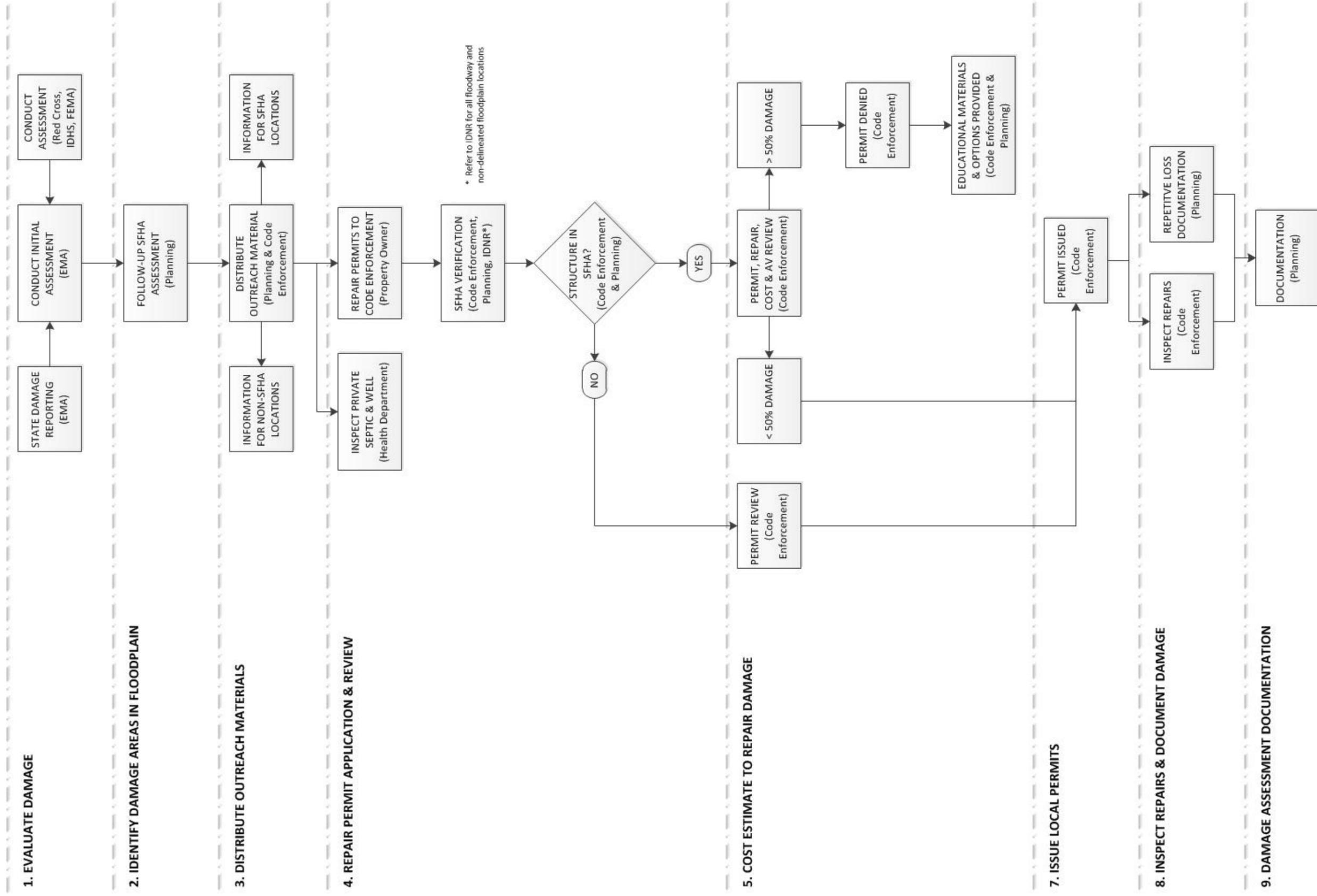
8. DOCUMENTATION

- City (Planning) – maintain all flood-related records (database, worksheets, permits, elevation certificates), depth of flooding documentation (photography, water marks, mapping, etc.) as well as repetitive loss structures.

APPENDIX F-2

POST-FLOOD DAMAGE FLOW CHART

F-2 POST-FLOOD DAMAGE ASSESSMENT FLOW CHART



APPENDIX F-3
DATA COLLECTION PROTOCOL

F-3 POST-FLOOD DATA COLLECTION PROTOCOL

Immediately after a flood event, there is a window of opportunity to gather data that will improve the tools for evaluating future flood risks and possible alternatives to reducing those risks. Potential data to collect includes aerial mapping of the flood at or near its peak crest, setting high water marks, collecting rainfall distribution data, and comparing high water marks and inundated areas with how the risk areas associated with a similar type of an event are delineated on existing FIRMs. The following steps should be taken at the height and immediately after a major flood event:

1. **Coordinate Collection of Aerial Photography of the Flooded Areas**

Aerial photography provides information on approximate areas affected by the flooding. This data can be used immediately to locate areas needing assistance. They can also be used for improving the FIRMs that are used to regulate development in the floodplain. The more realistic those FIRMS appear the better tool they become. To make the photos valuable in the future, they need to be labeled with the location and a date and time (real time and time in relation to the peak flood elevations) of the photography. It is critical to photograph areas and/ or objects where the “high water” demarcation can be “field surveyed” after the floodwaters recede and crews have time to work such tasks into their schedule. Noting the location and direction of the photos on a map is a useful way of cataloging the pictures. Potential parties that can assist in this matter include, but are not limited to, IDHS, IDNR, aerial photography companies, and local news media.

2. **Coordinate Collection of High Water Marks along the Streams and in Flooded Areas**

High water marks indicate peak flood elevations reached during a flood event and are no more than a nail set in a tree, a crow’s foot scribed on a bridge abutment, a paint mark on street pavement, or a notation of the distance down or up from some physical feature. The location of the mark is described and a surveyor later ties in the elevation. Consideration should be given to setting marks upstream and downstream of features such as bridges or other structures that are of interest in regards to their effect on flood elevations. It is extremely important to document the date and time that the high water mark was set so that post-flood analysis can be performed appropriately. This information is kept on file and used later for a variety of purposes. The main purpose is to calibrate hydraulic models. As an example, the high water marks set by the USGS and the Bartholomew County Surveyor’s Office for the June 2008 flood were invaluable in the development and calibration of a hydraulic model for Haw Creek that was used to evaluate potential flood protection measures.

These high water marks should, at the very least, be kept on file with the community for use in the future. Additional flood related information such as ground photos, aerial photography, rainfall data, news articles, etc. collected and kept on file could prove useful in the future as well.

Potential parties that can assist in this matter include, but are not limited to, IDNR, USGS, County Surveyor's Office, County Highway Department, and City Engineering and Street Departments. The IDNR has developed standard forms that may be obtained by various potential data collectors in advance so that the quality and formatting of collected data by various entities is, to the extent possible, compatible.

- 3. Coordinate Collection and Capture of Data on Observed Rainfall Depths and Patterns**
Often, rainfall data can be obtained for a short period from various websites after the rain event but then is lost due to storage space limitations. This data should therefore be obtained soon after the flood and preserved for future reference. Potential websites and data sources for recorded/observed rainfall information associated with a flooding event include, but are not limited to, Indiana COOP data from the National Weather Service website, the Community Collaborative Rain, Hail, & Snow Network (CoCoRaHS) available from CoCoRaHS website, and National Weather Service – NOAA precipitation hourly precipitation radar data and shape files available from the NWS-NOAA website. A copy of the captured data should be printed and kept in files for future use.
- 4. Coordinate Collection and Capture of AHPS Observed and Forecast Flood Stages**
The AHPS observed and, if available, forecast flood stages provide invaluable information on how fast and how high the flood stages reached during a given flood event and how the actual observed stages compared to the predicted flood stages. This data is readily available for a short period of time at the outset, during, and immediately after the flood event for each USGS station from the AHPS website, but then is lost due to storage space limitations. This data (perhaps screen shots of what is seen on the web page) should therefore be captured throughout the flooding event, printed, and kept in files for future use.
- 5. Compare the Extent of Observed Flooded Areas to FIRMs**
Flood events also provide a good opportunity to compare Flood Insurance Rate Map (FIRM) delineations with the actual areas inundated by the flood event. If large discrepancies are found, it could indicate that the mapping used for the floodplain delineation or the data used for the hydraulic or hydrologic modeling were not detailed enough or accurate. Noting differences is good documentation for either showing the need for the community to pursue a Letter of Map Revision or to have documentation to provide to the State for selecting and prioritizing revisions under the current FEMA program to update flood maps.

APPENDIX G

STANDARD OPERATING PROCEDURES

This Appendix is a placeholder of Standard Operating Procedures that are specifically developed as part of the FREP. These may be used to clarify roles and responsibilities or procedures.

APPENDIX H PAST FREP ACTIVITY

This Appendix is the placeholder for copies of past FREP activity reports,

APPENDIX I

FREP REVIEW, REVISIONS AND RECOMMENDED ENHANCEMENTS

- I-1 ANNUAL REVIEW, PERIODIC TEST & REVISIONS
- I-2 ANNUAL REVIEW VERIFICATION STATEMENT
- I-3 RECOMMENDED ENHANCEMENTS TO THE FREP

APPENDIX I-1

ANNUAL REVIEW, PERIODIC TEST & REVISIONS

I-1 ANNUAL REVIEW, PERIODIC TEST & REVISIONS

FREP Annual Review

The Fire Chief (acting as the FREP Coordinator) and Planning Department Floodplain Administrator are responsible for conducting an Annual Review of the FREP. This review will include:

- A. Confirm that all contact names, email, and phone numbers on the Flood Event Notification flow chart (Appendix D) are accurate.
- B. Review FEMA Incident Command System (ICS) Form for ease of use and accuracy of recording actions during a flood event (Appendix B).
- C. Update the FREP, as needed.
- D. Complete the following FREP Annual Review Verification Statement and maintain a copy in this Appendix.

The Fire Chief is responsible for reviewing the emergency response in the FREP and the Floodplain Administrator is responsible for reviewing the flood mapping and post-flood damage assessment. The Floodplain Administrator will make sure revisions are documented and the FREP is updated as needed.

FREP Periodic Test

The Fire Chief (acting as FREP Coordinator) and Planning Department Floodplain Administrator will perform a Periodic Test of the FREP every 3 years.

The Periodic Test will consist of a meeting and a table-top exercise. Attendance should include members of the EOC Coordination Team and a facilitator. Other organizations involved with a moderate or major flood event are encouraged to participate, at the discretion of the FREP Coordinators (Fire Chief and EMA Director). Such organizations may include the Red Cross and NWS.

The table-top exercise will begin with the facilitator presenting a scenario of a moderate or major flood event in one or more streams in the City of Columbus. The scenario will be developed by the Floodplain Administrator or the facilitator prior to the exercise. Once the scenario has been presented, the participants will discuss their responses and actions to address and resolve the scenario. The facilitator will control the discussion, ensuring realistic responses and developing the scenario throughout the exercise. As it progresses, the table-top exercise will be recorded using the ICS Forms. Participants should each complete the ICS Form as they would during an actual event.

After the table-top exercise, the Fire Chief and Floodplain Administrator will both lead the group in a discussion on edits and recommendations to improve the FREP. In addition, any other emergency procedures or standard operating procedures can be discussed. If there are no other topics for discussion, then the Fire Chief and Floodplain Administrator will adjourn the meeting and together write a Periodic Test Summary Memorandum and include it this Appendix of the FREP.

Revisions

The Floodplain Administrator is responsible for ensuring that the FREP is revised (updated). When revisions occur, the Floodplain Administrator will provide the revised sections to those listed on the FREP Distribution List (Appendix A).

APPENDIX I-2

ANNUAL REVIEW VERIFICATION STATEMENT

I-2 **FREP ANNUAL REVIEW VERIFICATION STATEMENT**

Date of Drill: _____

- A. All contact names, email, and phone numbers on the Flood Event Notification flow chart (Appendix D) are accurate.
- B. The FEMA Incident Command System (ICS) Forms are available for use and accuracy of recording actions during a flood event (Appendix B).
- C. The FREP has been updated, as needed.
- D. The FREP Annual Review procedures were followed.

Additional Comments:

Fire Chief (acting as FREP Coordinator)

Date

Printed name

Planning Department Floodplain Administrator

Date

Printed name

APPENDIX I-3

RECOMMENDED ENHANCEMENTS TO THE FREP

I-3 RECOMMENDED ENHANCEMENTS TO THE FREP

The following list should be revisited as part of the regular revision to ensure that the full vision of the FREP is eventually achieved.

- The Fire Department should purchase a boat and complete the necessary training for water rescues. This boat is meant to supplement not replace the Sheriff's Water Rescue team.
- The Planning Department Floodplain Administrator should replace paper maps and post-flood damage assessment reporting forms with digital resources (handheld GPS data loggers or laptops) and automatic updates to Excel-based tracking system
- The Planning Department Floodplain Administrator should work with NWS to expand stream gage forecasting capabilities to include upstream and downstream of the City of Columbus. In particular the Flatrock River at Columbus, Haw Creek near Clifford, and Clifty Creek near Columbus gages.
- The Planning Department Floodplain Administrator should work with USGS to expand the current limited interval depth mapping into a library of static maps and/or a dynamic inundation map that would change automatically as the stage height forecast would change.
- The Street Department should supplement the County Highway sand bag supply with an adequate supply at the City garage. The City should consider purchasing sand and a sand bag machine to expedite filling bags as part of the flood fight.