

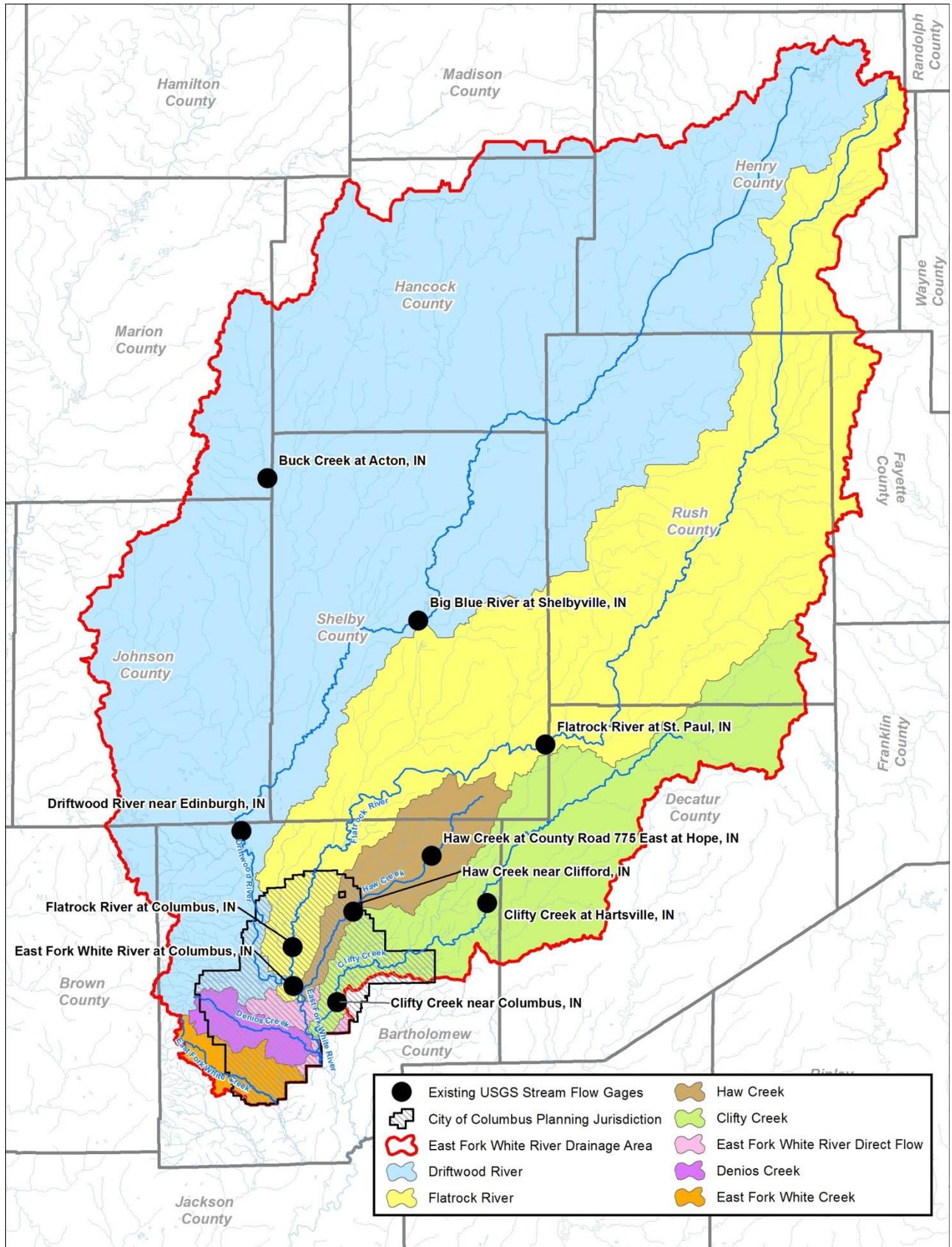
FREP

FLOOD RESPONSE & EVACUATION PLAN

CITY OF COLUMBUS, INDIANA

Copy No. _____
Revision No. 0
December 2012

This Plan should be activated for an affected region of the City of Columbus when a wet weather (rainfall) event results in the occurrence of a flood (stream spilling out of its banks and starting to cause damage) of any small to intermediate sized stream in the City or when an action stage is detected, either in the City or upstream in Bartholomew County for any of the following major rivers: Driftwood River, East Fork White River, Haw Creek, Flatrock River, and Clifty Creek.



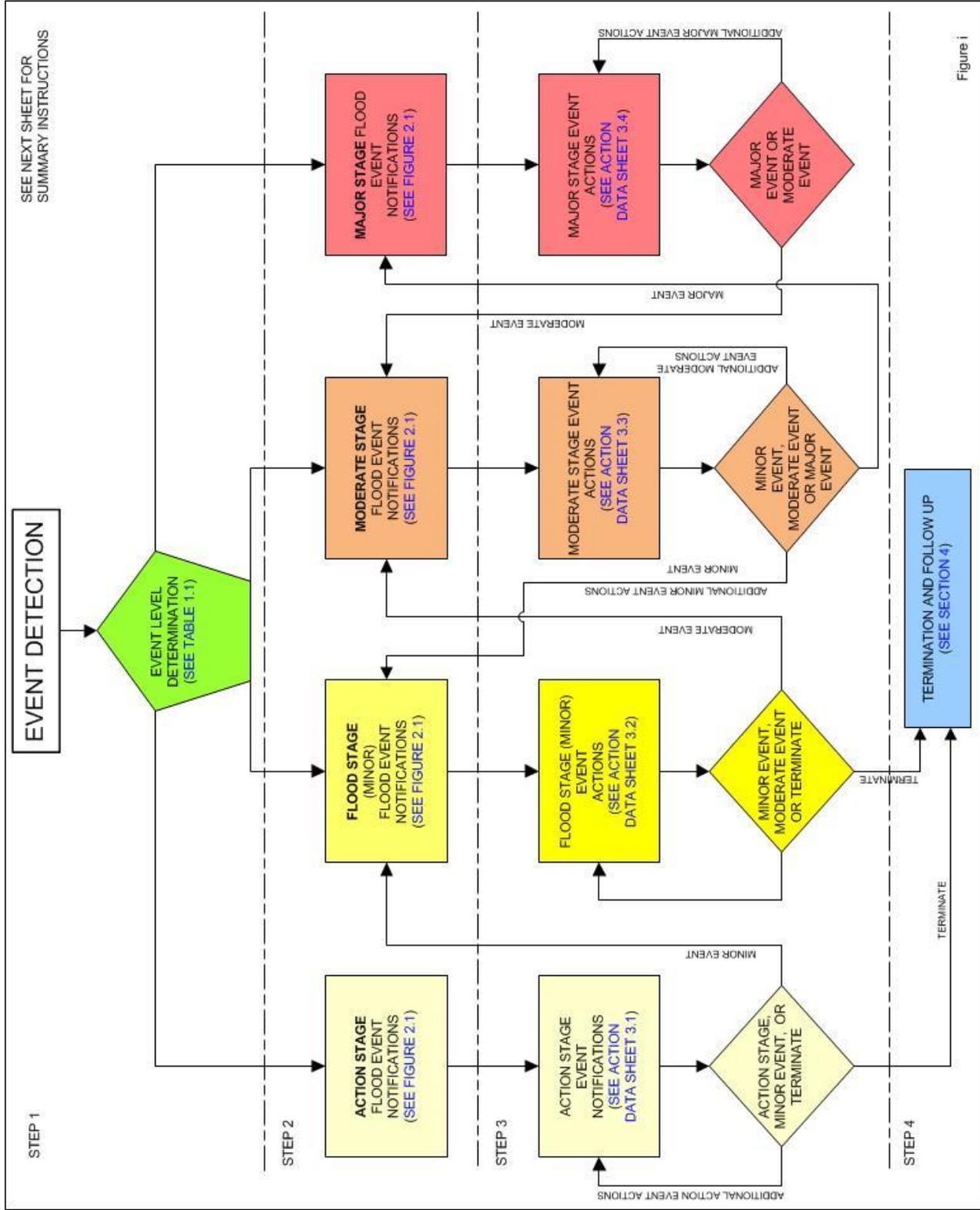


Figure i

SUMMARY OF FREP PROCESS

There are four steps that must be followed anytime a flood event is detected in the City of Columbus. The steps are:

- Step 1: Event Detection and Level Determination
- Step 2: Notification and Communication
- Step 3: Expected Actions
- Step 4: Termination and Follow-up

A flood event is defined in Section 1.2.1 of this Flood Response and Evacuation Plan (FREP). Specific actions required for each step will depend on the severity of the situation as defined during Step 1. The actions required for each step of the FREP are summarized in a flow chart (Figure i) and are described in the corresponding FREP Section. A summary of each step is provided below.

Step 1 - Event Detection and Level Determination

During the initial step, a flood event is detected and classified by the FREP Coordinators into one of the following flood event levels:

- Action Stage Flood Event
- Flood Stage (Minor Flood) Event
- Moderate Stage Flood Event
- Major Stage Flood Event

Information to help the FREP Coordinators determine which of the above event levels is applicable is provided in Section 1 of this FREP. As part of this step, the FREP Coordinators will also determine the approximate expected extent and severity of the flood event so that it can be conveyed as part of the notification messages.

Step 2 - Notification and Communication

After the event level has been determined, notifications are made in accordance with the appropriate notification flow chart provided in Section 2 of this FREP.

Step 3 - Expected Actions

After the initial notifications are made, the FREP Coordinators should execute appropriate flood response. During this step of the FREP, there is a continuous process of taking actions, assessing the status of the situations, and keeping others informed through communication channels established during the initial notifications. The suggested actions to be taken for each Flood Event Level are provided on Action Sheets in Section 3. The FREP may go through multiple event levels as the situation either improves or worsens.

Step 4 - Termination and Follow-up

Once the event has ended or been resolved, recovery, termination, and follow-up procedures should be followed as outlined in Section 4. FREP operations can only be terminated after completing operations under an Action Stage or Flood Stage (Minor Flood) Event.

ANNUAL REVIEW AND PERIODIC TEST

This FREP document will require an annual review and update to stay current. A periodic test of the FREP procedures is also required (test interval, typically 3 years) to ensure continued effectiveness. For annual review and periodic test procedures, reference Appendix I.

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PRIVACY STATEMENT

This FREP is intended to identify general responsibilities and procedures of the City of Columbus during a flood event. It is designed as a source of reference for the FREP Coordinators, City leaders, and decision-makers and no reliance should be placed on it by others.

ACKNOWLEDGEMENTS

This plan was prepared by Christopher B. Burke Engineering, LLC (CBBEL) for the City of Columbus under the direction and guidance of David Allmon (Chief, Fire Department), Jeff Bergman (Director, Planning Department), and Dennis Moats (Director, Bartholomew County Emergency Management Agency).

PURPOSE

Advanced warning of flood levels and associated impacted areas that are possible from an approaching storm greatly enhances the ability of individuals and communities to respond and protect themselves. The purpose of this FREP is to reduce the risk of human life loss, injury, and damage to property during a flood event in the City of Columbus.

SCOPE

The scope of the FREP is limited to the actions that the FREP Coordinators will need to make decisions and to accurately inform others of the likely extent of flooding. Although several tools and guidance are provided to assist in determining the likely extent and depth of flooding in each neighborhood, impassible roads, flood-safe routes, and type of actions needed for response and evacuations, the response and evacuation standard operating procedures (SOPs) for emergency managers and first responders (EMA, E911, Fire, Police, and Red Cross) are not included in the FREP.

PRE-REQUISITE TASKS

To ensure the full functionality of the FREP, the following tasks will need to be completed once the FREP has been adopted.

- A. Post the Flood Safe Route map (Exhibit 5) in the City and County Highway garages and assign specific routes to Street Department and County Highway Crews. Conduct a test run to balance the time needed for each route to clean inlets and install “high water” sign and street closure barricades. If needed, prepare a Flood Safe Route SOP and add it to Appendix G.
- B. Assemble a list of local pilots that are willing to fly during a flood and take photographs of the areas affected.
- C. Create a new or modify the existing EMA door hanger to include Code Enforcement contact information.
- D. Confirm that the Planning Department Floodplain Administrator is provided with a City smart phone for after-hours notifications and communications.
- E. Obtain the latest IDNR High Water Marks form.

REVISIONS

For revision procedures, reference Appendix D.

Revision No.	Date	Revisions Made
0	<u>(December 2012)</u>	Initial publication based on CBBEL FREP Format

Revised pages inserted in this FREP by

(Signature)

(Printed Name)

(Date)

SECTION 1

EVENT DETECTION AND LEVEL DETERMINATION

This section of the Flood Response and Evacuation Plan (FREP) describes the roles and responsibilities of various parties involved, provides a list of preparedness actions prior to a flood event, and provide details for the first step that must be followed whenever a flood event is detected in the City of Columbus. This section also describes how an event is detected and provides information to assist the FREP Coordinators in determining the appropriate level for the event as it currently exists as well as the expected extent and severity of flooding.

1.1 Roles, Responsibilities, and Authorities

The following defines the roles, responsibilities, and authorities of key individuals for the FREP.

FREP Coordinators: The FREP Coordinators have the authority to take the necessary actions described in this FREP. The FREP Coordinators are responsible for providing initial, timely, and accurate notifications after the flood event level has been determined. The FREP Coordinators are also responsible for providing subsequent updates of the situation to assist in making timely and accurate decisions regarding warning and evacuation of the affected public.

In the City of Columbus there are 2 FREP Coordinators. Each Coordinator has specific roles and primary responsibilities as part of a flood fight and follow-up.

FREP Coordinator (Fire Chief) – primarily responsible for leading the rescue and evacuation efforts during a flood fight and making notifications listed in Section 2. Assumes the role of, or assigns someone to be the Incident Commander of the flood fight effort

FREP Coordinator (EMA Director) – primarily responsible for monitoring NWS and USGS stream gage data during wet weather (prior to FREP being activated) and during a flood fight event once the FREP has been activated as well as making notifications listed in Section 2.

Incident Commander: The Incident Commander is responsible for all aspects of an emergency response. The incident commander sets priorities and defines the organization of the incident response teams and the overall incident action plan. The incident commander may, at their own discretion, assign individuals, who may be from the same agency or from assisting agencies, to subordinate or specific positions for the duration of the emergency.

County Emergency Operations Center (E911) Director: The Emergency Operations Center Director is responsible for providing a communication link between the FREP Coordinators, Incident Commander, City Street/County Highway crews and first responders. Using the mass notification software, E911 will be responsible for disseminating pre-scripted messages to the affected public.

Public Safety Public Information Officer: The Public Safety Public Information Officer (PIO) is responsible for disseminating information to the media and affected public in the City of Columbus.

The affected public will be notified using E911's mass notification software. Pre-scripted messages are provided in Section 2.

Planning Department Floodplain Administrator: The Planning Department Floodplain Administrator is responsible for providing GIS data (flood depths and flood-safe routes) as needed, as part of the decision-making process and leading the post-flood damage assessment in Section 4.

Once the flood event is terminated, the FREP Coordinators are responsible to develop (within 7 days), an accurate summary document of the field observation and activities of the event. The Fire Chief (acting as FREP Coordinator), in partnership with the Planning Department Floodplain Administrator, are responsible for updating, conducting, and maintaining a record of the FREP annual review, periodic test, and revisions included in Appendix I of this FREP.

1.2 Flood Preparedness and Readiness

Flooding is a common occurrence. Preparedness and readiness of the City's resources (staff, structures, and equipment) is essential to reduce flood losses and recovery efforts. During a flood event and at least two times per year, the FREP Coordinators will:

- A. Confirm that adequate sand inventory for sandbags in the County garage is maintained
- B. Confirm that adequate number of "High Water" signs and street barricades in the City and County garages is maintained
- C. Confirm Flood Safe Route map (Exhibit 5) is posted in the City and County Highway garages and that each garage has developed and/or have updated specific routes and assignments necessary to see that all routes are checked as needed
- D. Confirm that a list of pilots willing to fly during a flood and take aerial photos have been developed and coordination has been made in advance so that their services can be engaged when needed in a timely manner
- E. Review NWS and USGS flood forecast and notification products to ensure the most recent resources are being used
- F. Confirm with the USGS that automated stream gage alerts have been set up and are enabled for FREP Coordinators and other key staff
- G. Confirm that the names and contact information is current on the Flood Event Notification List.
- H. Conduct a test of radios, cell phones, and mass notification software used for communication during a flood fight.
- I. Confirm that adequate door hangers are available for the Post-Flood Damage Assessment

1.3 Event Detection

Depending on the availability of a USGS stream gage and/or a co-located NWS AHPS station on the flooding source, a flood event may be detected by either of the following (listed in the order of reliability and ease of use):

- For Gaged Streams (East Fork White River, Driftwood River, Flatrock River, Haw Creek, and Clifty Creek):
 - Automated Water Alert notification from USGS of a predetermined gage height(s) at

- one or more stream gages in Columbus area (See Appendix C-1 for the predetermined gage heights associated with various event levels at each stream gage)
- Observation that a predetermined water level has been reached at one or more USGS/NWS AHPS gages in Columbus area (See Appendix C-1 for the predetermined gage heights associated with various event levels at each stream gage and Appendix C-3 for how to access a USGS/AHPS real time gage information)
 - For Gaged Streams with Forecast Capabilities (East Fork White River, Driftwood River, and also soon for Haw Creek and Flatrock River):
 - Observation that a predetermined water level is forecasted to be reached soon at one or more USGS/NWS AHPS gages designated as forecast points (See Appendix C-1 for the predetermined gage heights associated with various event levels at each gage as well as whether these gages are currently designated as a forecast point and Appendix C-3 for how to access a USGS/AHPS real time gage information and forecast)
 - For Ungaged Streams:
 - Pairing of NWS Ohio River Forecast Center Flash Flood Guidance and Precipitation Forecast products in the area. A Flood Event is detected when the forecast precipitation depth for the critical duration associated with the subject watershed is higher than the precipitation depth deficit noted in the Flash Flood Guidance for the same duration. Steps to follow are:
 - Determine critical duration of the watershed from table provided in Appendix C-4
 - Determine the forecast depth of precipitation for that critical duration from site referenced in Appendix C-5
 - Compare the precipitation depth from previous step to Flash Flood Forecast for the selected duration (noted in Appendix C-6) to determine if a flood event is likely or imminent
 - Report of flooding in a low-lying area

After a flood event is detected and reported, the FREP Coordinators are responsible for determining the appropriate flood event level (as defined in Section 1.4.2) and the expected extent and severity of the flooding.

1.4 Event Level Determination

1.4.1 Flood Event

A flood event is defined as water levels adjacent to rivers, streams, creeks, ditches, and other major waterways or in other low-lying areas that begin to impact life and/or property. Flood event levels are defined in Section 1.4.2.

1.4.2 Event Level Determination

The FREP Coordinators shall be responsible for categorizing flood events as one of the following event levels: Action Stage Flood Event, Flood Stage (Minor Flood) Event, Moderate Stage Flood Event, and Major Stage Flood Event. Flood event levels are based on USGS stream gage stages and flood forecast information provided by the NWS including the AHPS, and pairing of Flash Flood Guidance and Precipitation Forecast in the area. Appendix C-1 lists the gage height corresponding to each flood event level at each of the USGS real-time stream gages in the City of Columbus (and upstream in Bartholomew County).

Action Stage Flood Event – is a warning stage only and provides longer warning time and is therefore recommended as an initial trigger level for a more intensive monitoring of the gage heights.

Flood Stage (Minor Flood) Event – is defined as minimal or no property damage but possibly some public threat or inconvenience.

Moderate Stage Flood Event – is defined as some inundation of structures and roads near streams resulting in some evacuations of people and/or transfer of personal property to higher elevations if necessary.

Major Stage Flood Event – is defined as extensive inundation of structures and roads resulting in significant evacuations of people and/or transfer of personal property to higher elevations.

1.4.3 Event Level Determination Guidance

Table 1.1 shall be used as a guide for determining the appropriate event level. This table attempts to be all inclusive; however, an event or condition may arise that is not covered in this table. In this circumstance, always designate the higher event level as the governing event level.

**TABLE 1.1
EVENT LEVEL DETERMINATION GUIDANCE**

OBSERVATION	EVENT LEVEL
<ul style="list-style-type: none"> • Automatic Water Alert notification from 1 or more USGS gages at Action Stage Flood level (Appendix C-1) • Observation from 1 or more USGS/NWS AHPS gages at Action Stage Flood level (Appendix C-1 and Appendix C-2) • Observation that Action Stage Flood level is forecasted to be reached at 1 or more USGS/NWS AHPS gages • Pairing of critical rainfall duration, precipitation forecast, and precipitation depth-duration-frequency curve indicates a potential Action Stage Flood level (Appendix C-4, Appendix C-5 and Appendix C-7) • Report of streams at bankfull height • Judgment of FREP Coordinators based on a variety of sources 	<p align="center">Action Stage Flood Event</p>
<ul style="list-style-type: none"> • Automatic Water Alert notification from 1 or more USGS gages at Flood Stage level (Appendix C-1) • Observation from 1 or more USGS/NWS AHPS gages at Flood Stage level (Appendix C-1 and Appendix C-2) • Observation that Flood Stage level is forecasted to be reached at 1 or more USGS/NWS AHPS gages • Pairing of critical rainfall duration, precipitation forecast, and precipitation depth-duration-frequency curve indicates a potential Flood Stage level (Appendix C-4, Appendix C-5 and Appendix C-7) • Report of minor flooding in low-lying areas • Judgment of FREP Coordinators based on a variety of sources 	<p align="center">Flood Stage (Minor Flood) Event</p>
<ul style="list-style-type: none"> • Automatic Water Alert notification from 1 or more USGS gages at Moderate Stage Flood level (Appendix C-1) • Observation from 1 or more USGS/NWS AHPS gages at Moderate Stage Flood level (Appendix C-1 and Appendix C-2) • Observation that Moderate Stage Flood level is forecasted to be reached at 1 or more USGS/NWS AHPS gages • Pairing of critical rainfall duration, precipitation forecast, and precipitation depth-duration-frequency curve indicates a potential Moderate Stage Flood level (Appendix C-4, Appendix C-5 and Appendix C-7) • Report of moderate flooding in low-lying areas • Judgment of FREP Coordinators based on a variety of sources 	<p align="center">Moderate Stage Flood Event</p>
<ul style="list-style-type: none"> • Automatic Water Alert notification from 1 or more USGS gages at Major Stage Flood level (Appendix C-1) • Observation from 1 or more USGS/NWS AHPS gages at Major Stage Flood level (Appendix C-1 and Appendix C-2) • Observation that Major Stage Flood level is forecasted to be reached at 	<p align="center">Major Stage Flood Event</p>

<p>1 or more USGS/NWS AHPS gages</p> <ul style="list-style-type: none">• Pairing of critical rainfall duration, precipitation forecast, and precipitation depth-duration-frequency curve indicates a potential Major Stage Flood level (Appendix C-4, Appendix C-5 and Appendix C-7)• Report of major flooding beyond low-lying areas• Judgment of FREP Coordinators based on a variety of sources	
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1.5 Determination of the Expected Flood Extent and Severity

Determining the expected extent and severity of an in-progress or an impending flood event is extremely useful for the first responders so that they can focus public notifications to areas that are significantly impacted by the flood event. As discussed later in Section 3 of this FREP, such a determination would also provide crucial guidance for making decisions associated with warning and evacuation of the public at risk.

1.5.1 Determining Expected Flood Extent and Severity along Gaged Streams

Within Columbus area, USGS stream gaging stations are available on East Fork of White River, Driftwood River, Flatrock River, Haw Creek, and Clifty Creek. Once a Flood Event has been detected and an Event Level has been assigned, the following steps should be taken to determine the expected extent and severity of an in-progress or an impending flood event along the noted gaged streams:

- A. Determine the current gage height from the USGS/AHPS site along the affected stream (See Appendix C-3). If the station is a forecast point (East Fork White River at Columbus, Driftwood River near Edinburgh, and soon to be designated Flatrock River near Columbus and Haw Creek near Clifford gaging stations), further determination of the expected extent and severity of the forecast stages can also be made.
- B. For stream gages with a USGS Inundation Map Library (currently at Driftwood River near Columbus, but soon to be available at Flatrock River near Columbus, East Fork White River at Columbus, and Haw Creek near Clifford), look up/download the inundation limits (See Appendix C-8 for a guide to access USGS Inundation Map Libraries), If no USGS Libraries are Available at the affected stream gage, skip to Step C.
- C. Go to Appendix C-2 and determine the closest highest frequency associated with gage height determined in Step A
- D. Go to Exhibits 1 through 4, respectfully for 10% (10-year) through 0.2% (500-year) floods, to determine the approximate expected extent of the flooding and impacts associated with the current (or impending) event affecting the subject flooding source.

1.5.2 Determining Expected Flood Extent and Severity along Ungaged Streams

There are currently no stream gages on the following potential flooding sources within the Columbus Planning area: Airport Tributary, Denios Creek, Opossum Creek, East Fork White Creek, East Fork White Creek Tributary, North Ogleville Tributary, Catherine Creek, Wolf Creek, Big Slough, and Sloan Branch. Once a Flood Event has been detected and an Event Level has been assigned, the following steps should be taken to determine the expected extent and severity of an in-progress or an impending flood event along the noted gaged streams:

- A. Determine the likely Critical Rainfall Duration associated with the flooding source(s) for which the flood event has been activated (See table in Appendix C-4).
- B. Obtain the best available precipitation forecast within the watershed of the subject stream associated with or closest to the critical rainfall duration determined in step 2 (see Appendix C-5 for guidance on obtaining NWS quantitative precipitation forecast).
- C. Go to Precipitation-Depth-Duration-Frequency Curve in Appendix C-7 and look up the next highest frequency line associated with the forecast rainfall date and its associated duration as determined in Step B. If the determined frequency is associated with an

event smaller than the 10% (10-year) flood, assign the 10-year flood frequency to the event.

- D. Go to Exhibits 1 through 4, respectfully for 10% (10-year) through 0.2% (500-year) floods, to determine the approximate expected extent of the flooding and impacts associated with the current (or impending) event affecting the subject flooding source.

It should be noted that the above procedure noted for ungaged streams may also be used for any gaged stream to get a heads up on potentially expected extent and severity of an impending flood event. This is especially useful for streams with USGS stream gages that are currently not a forecast point.

SECTION 2

NOTIFICATION AND COMMUNICATION

This section of the FREP describes the appropriate notifications that should be made and pre-scripted messages that should be conveyed after the FREP Coordinators have determined the flood event level. This section also outlines the communication systems that are available for making notifications as well as a sample media releases and a list of media contacts. Notifications should be made in accordance with the appropriate Notification Flow Chart provided in this Section.

2.1 Communication Systems

All flood fight communications are conducted via cell phones, mass notification system (via E911), public safety radio system or among members of the Flood Fight Team assembled in the EOC.

2.2 Pre-scripted Messages

The following pre-scripted messages may be used as a guide to communicate the status of an event. It is expected that this message will be abbreviated to 140 characters in order to be broadcasted using the automated E911 text, email, and voice message format.

Action Stage Event

- This is *(name and affiliation)*, acting as a City of Columbus FREP Coordinator. I am making this call in accordance with the City of Columbus' Flood Response and Evacuation Plan.
- An Action Flood Stage Event has been detected affecting the Columbus area.
- Minor flooding condition may exist along the *(name)* rivers and/or low-lying areas in the City of Columbus *(use information from Section 1.5 (extent and severity) to be more specific if flooding is isolated to a certain area)*.
- The FREP has been activated, currently at the Action Flood Stage Event level.
- I will keep you apprised of the situation. The best number to contact me during this event is *(emergency contact number)*.

Flood Stage (Minor Flood) Event

- This is *(name and affiliation)*, acting as a City of Columbus FREP Coordinator. I am making this call in accordance with the City of Columbus' Flood Response and Evacuation Plan.
- A Flood Stage Event has been detected affecting the Columbus area.
- Minor flooding condition exists along the *(name)* rivers and/or low-lying areas in the City of Columbus *(use information from Section 1.5 (extent and severity) to be more specific if flooding is isolated to a certain area)*.
- The FREP has been activated, currently at the Flood Stage (Minor Flood) Event level.
- I will keep you apprised of the situation. The best number to contact me during this event is *(emergency contact number)*.

Moderate Stage Flood Event

- This is *(name and affiliation)*, acting as a City of Columbus FREP Coordinator. I am making this call in accordance with the City of Columbus' Flood Response and Evacuation Plan.
- A Moderate Stage Flood Event has been detected affecting the Columbus area.
- Moderate flooding condition exists along the *(name)* rivers and/or low-lying areas in the City of Columbus *(use information from Section 1.5 (extent and severity) to be more specific if flooding is isolated to a certain area)*.
- The FREP has been activated, currently at the Moderate Stage Flood Event level.
- **Prepare to evacuate** along the *(identify potential evacuees/evacuation limits)*.
- I will keep you apprised of the situation. The best number to contact me during this event is *(emergency contact number)*.

Major Stage Flood Event

- This is *(name and affiliation)*, acting as a City of Columbus FREP Coordinator. I am making this call in accordance with the City of Columbus' Flood Response and Evacuation Plan.
- A Major Stage Flood Event has been detected affecting the Columbus area.
- Major flooding condition exists along the *(name)* rivers and/or low-lying areas in the City of Columbus *(use information from Section 1.5 (extent and severity) to be more specific if flooding is isolated to a certain area)*.
- The FREP has been activated, currently at the Major Stage Flood Event level.
- **Evacuate immediately** along the *(identify potential evacuees/evacuation limits)*.
- I will keep you apprised of the situation. The best number to contact me during this event is *(emergency contact number)*.

Termination of Flood Event

- This is *(name and affiliation)*, acting as a City of Columbus FREP Coordinator. I am making this call in accordance with the City of Columbus' Flood Response and Evacuation Plan.
- The flood event has been terminated.
- Areas adjacent to *(name)* rivers and/or low-lying areas in the City of Columbus *(use information from Section 1.5 (extent and severity) to be more specific if flooding is isolated to a certain area)* may still be flooded.

2.3 Public Affairs Plan

In the event of a flood event, the Public Safety PIO will be alerted and briefed on the situation and will deliver one of the following pre-scripted messages for public release based on the existing conditions and information from the FREP Coordinators, or other sources. Targeted messages to the affected public will be sent (via E911) using mass communication software.

Announcement for Action Stage Flood Event

THE CITY OF COLUMBUS ANNOUNCED AT *(time)* TODAY THAT STRUCTURES AND ROADS ADJACENT TO THE *(name of river or stream)* AND IN LOW-LYING AREAS MAY EXPERIENCE POSSIBLE FLOODING. THE AREAS AND/OR ROADS OF CONCERN INCLUDE *(vary*

depending on area affected). ADDITIONAL INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

Announcement for Flood Stage (Minor Flood) Event

THE CITY OF COLUMBUS ANNOUNCED AT *(time)* TODAY THAT STRUCTURES AND ROADS ADJACENT TO THE *(name of river or stream)* AND IN LOW-LYING AREAS MAY EXPERIENCE MINOR FLOODING. THE AREAS AND/OR ROADS OF CONCERN INCLUDE *(vary depending on area affected)*. ADDITIONAL INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

Announcement for Moderate Stage Flood Event

THE CITY OF COLUMBUS ANNOUNCED AT *(time)* TODAY THAT STRUCTURES AND ROADS ADJACENT TO THE *(name of river or stream)* AND IN LOW-LYING AREAS MAY EXPERIENCE MODERATE FLOODING. THE AREAS AND/OR ROADS OF CONCERN INCLUDE *(vary depending on area affected)*. SHOULD THIS CONDITION WORSEN, THE FOLLOWING AREAS SHOULD PREPARE TO EVACUATE: *(list areas and location of shelters for both residents and pets)*

THE CITY OF COLUMBUS SPOKESPERSON SAID THAT PEOPLE SHOULD AVOID DRIVING OR WALKING ON ROADS OR BRIDGES THAT ARE COVERED BY WATER. THE DEPTH OF THE WATER OR STRENGTH OF THE CURRENT MAY BE DECEIVING. AS LITTLE AS TWO FEET OF WATER CAN CARRY AWAY A CAR AND SIX INCHES CAN KNOCK A PERSON OFF THEIR FEET. ADDITIONAL INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

Announcement for Major Stage Flood Event

URGENT, URGENT: THE CITY OF COLUMBUS ANNOUNCED AT *(time)* TODAY THAT STRUCTURES AND ROADS ADJACENT TO THE *(name of river or stream)* AND IN LOW-LYING AREAS MAY EXPERIENCE MAJOR FLOODING. THE AREAS AND/OR ROADS OF CONCERN INCLUDE *(vary depending on area affected)*. THE FOLLOWING AREAS ARE ADVISED TO EVACUATE IMMEDIATELY: *(list areas and location of shelters for both residents and pets)*.

THE CITY OF COLUMBUS SPOKESPERSON SAID THAT PEOPLE SHOULD AVOID DRIVING OR WALKING ON ROADS OR BRIDGES THAT ARE COVERED BY WATER. THE DEPTH OF THE WATER OR STRENGTH OF THE CURRENT MAY BE DECEIVING. AS LITTLE AS TWO FEET OF WATER CAN CARRY AWAY A CAR AND SIX INCHES CAN KNOCK A PERSON OFF THEIR FEET. ADDITIONAL INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

Announcement for Termination of Flood Event

THE CITY OF COLUMBUS ANNOUNCED AT *(time)* TODAY THAT THE FLOOD WATER IN *(name of river or stream)* IS RECEDDING AND THE FLOOD EVENT HAS BEEN TERMINATED. HOWEVER, STRUCTURES AND ROADS ADJACENT TO THE *(name of river or stream)* AND IN LOW-LYING AREAS MAY STILL BE FLOODED. THE AREAS AND/OR ROADS OF CONCERN

INCLUDE (*vary depending on area affected*). RE-ENTRY IS NOW POSSIBLE FOR THE FOLLOWING EVACUATED AREAS: (*list areas*). [*If re-entry is not possible*] ADDITIONAL INFORMATION ON RE-ENTRY TO THE FOLLOWING EVACUATED AREAS (*list areas*) WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

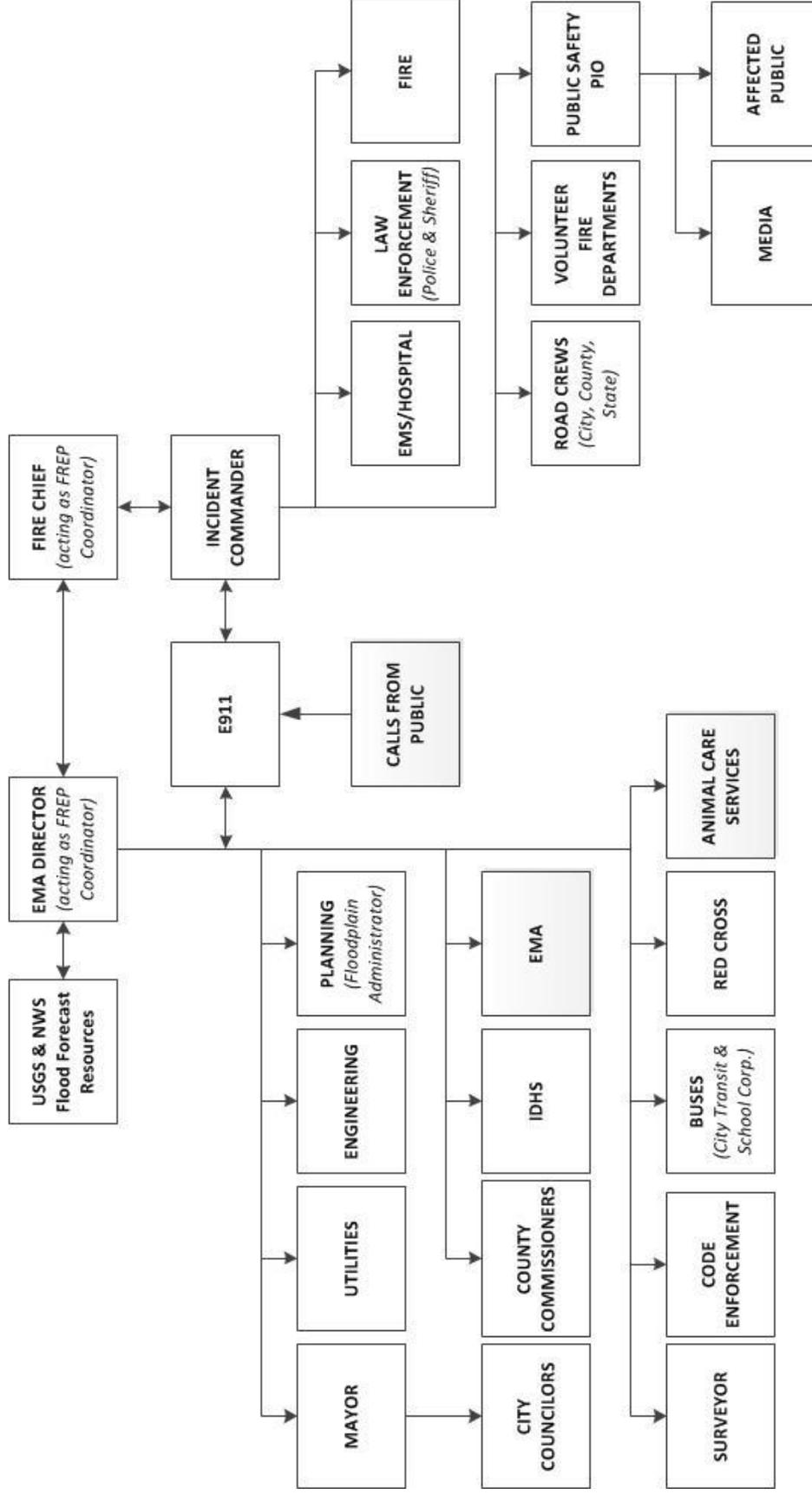
THE CITY OF COLUMBUS SPOKESPERSON SAID THAT PEOPLE SHOULD AVOID DRIVING OR WALKING ON ROADS OR BRIDGES THAT ARE COVERED BY WATER. THE DEPTH OF THE WATER OR STRENGTH OF THE CURRENT MAY BE DECEIVING. AS LITTLE AS TWO FEET OF WATER CAN CARRY AWAY A CAR AND SIX INCHES CAN KNOCK A PERSON OFF THEIR FEET.

2.4 Notification Flow Chart

The following flow chart (Figure 2.1) illustrates the flow of information during a flood event. Contact information is included in Appendix D. The FREP Coordinators are responsible for keeping this information current. The primary source of information is from the FREP Coordinators. The chart is intended for notification and other than for the Incident Commander it does not assign authority over another City/County Department or Agency. Mutual aid agreements and standard operating procedures prepared outside of the FREP have been established for these entities to work together in an emergency situation.

As stated earlier in the Scope, the FREP is limited to the actions that the FREP Coordinators will need to make decisions and to accurately inform others of the likely extent of flooding. Although several tools and guidance are provided to assist in determining impassible roads, flood-safe routes, and type of actions needed for response and evacuations, the response and evacuation SOPs for emergency managers and first responders (EMA, E911, Fire, and Police) are not included in the FREP.

FIGURE 2.1: FLOOD EVENT NOTIFICATION FLOW CHART



SEE CONTACT INFORMATION IN APPENDIX D

SECTION 3 EXPECTED ACTIONS

3.1 Action Data Sheets

After the FREP Coordinators have determined the event level and have made the appropriate notifications, the FREP Coordinators shall take action, using the following Action Data Sheets for Action Stage Flood Event, Flood Stage (Minor Flood) Event, Moderate Stage Flood Event, and Major Stage Flood Event as a guide. If resources described in the Action Data Sheets are not available, the FREP Coordinators should adapt with the available resources. Appendix D contains a summary table of expected actions for each entity identified in the notification flow charts in Section 2.

In addition to the actions noted in the action data sheets, there may be occasions when temporary protection of areas or facilities may be warranted through the use of sandbags or other temporary flood barriers. An example of such temporary protection would be the temporary flood protection undertaken by local residents around the area known as Noblitt Falls along Flatrock River, where flooding of access roads and houses is expected to start between 50-year and 100-year flooding event.

It should be noted that, based on detailed unsteady state hydraulic modeling performed by CBBEL for various streams including along Haw Creek in Columbus, placement of any flood barrier (temporary or permanent) within the flood conveyance corridor and/or floodplain storage areas of a stream will have some negative impact on adjacent areas during some flood event magnitudes. The degree and severity of such negative impact may vary based on how close the temporary or permanent barrier is to the stream and whether the barrier is encroaching in the conveyance path or merely displacing flood storage space, how large is the stream, how high is the barrier, and many other factors. Therefore, when considered necessary and warranted, a recommendation or decision to deploy temporary protection measures along streams in Columbus should be made based on a careful examination of expected potential impacts on a case by case basis.

The City of Columbus may wish to explore various locations for temporary sandbagging – such as where it could (1) serve to keep critical transportation routes open or (2) offer protection for an entire neighborhood, as appropriate, where the displaced water is either insignificant and/or only affects a park, field, or other lower value area and does not threaten public safety.

Techniques for proper use and placement of sandbags have been provided by many agencies, including the US Army Corps of Engineers (USACE). An example can be found at http://www.nws.usace.army.mil/Portals/27/docs/emergency/NWD_Sandbag_Pamphlet.pdf.

However, it should be emphasized that sandbags are not always fully effective for many applications and, as noted above, may also have unintended negative consequences on adjacent areas. Similar to other flood control, the responsibility and liability associated with the use of sandbags or other temporary flood barrier systems reside with the person(s) making the decision to deploy such measures.

ACTION DATA SHEET 3.1 EXPECTED ACTIONS Action Stage Flood Event

ACTIONS		
<p>A. Determine Areas Affected & Make Notifications</p> <ul style="list-style-type: none"> • FREP Coordinator (EMA Director) determines areas affected by flooding based on: <ul style="list-style-type: none"> ○ Procedure outlined in Section 1.5 ○ Observation of flooding in low-lying areas from City Street and County Highway Crews, Law Enforcement, or other sources. Information routed to the EMA Director through E911 • FREP Coordinators make notifications on Figure 2.1 using pre-scripted messages in Section 2.2 <p>B. Monitor Data & Conditions</p> <ul style="list-style-type: none"> • FREP Coordinator (EMA Director) monitors USGS stream gages and NWS flood forecast resources for the affected areas (refer to Section 1) • FREP Coordinator (Fire Chief) confirms flood-safe routes have been run by the Street Department and County Highway Crews (refer to Exhibit 5 for roads) <ul style="list-style-type: none"> • Ensure Crews have cleaned storm inlets and flood safe routes are free of standing water • Confirm Crews have installed “high water” signs and street barricades where needed and documented the location via E911 (use Exhibit 5 and pertinent information from Exhibit 1 as a guide) <p>C. Conduct Warning & Evacuation</p> <ul style="list-style-type: none"> • No warning or evacuation during an Action Stage Flood Event <p>D. Record Observations & Actions</p> <ul style="list-style-type: none"> • FREP Coordinators confirm that all entities involved so far in the flood fight have recorded their information, observations, and actions using ICS Forms (Appendix B) 		
EVALUATION / DECISION		
<p>FREP Coordinators evaluate the situation as events progress, or whenever conditions change. Use Table 1.1 determine whether:</p> <ul style="list-style-type: none"> A. The event can be terminated B. The event remains at the current Action State Flood Event. C. The event warrants escalation to a Flood Stage (Minor Flood) Event <p>Based on this determination, follow the appropriate actions below.</p>		
A) TERMINATE EVENT	B) EVENT REMAINS CURRENT	C) EVENT ESCALATES
Go to Termination and Follow-up (Section 4)	Continue recommended actions on this sheet	Go to Notification Flow Chart (Figure 2.1)

ACTION DATA SHEET 3.2
EXPECTED ACTIONS
Flood Stage (Minor Flood) Event

ACTIONS
<p>A. Determine Areas Affected & Make Notifications</p> <ul style="list-style-type: none"> • FREP Coordinator (EMA Director) determines areas affected by flooding based on: <ul style="list-style-type: none"> ○ Procedure outlined in Section 1.5 ○ Observation of flooding in low-lying areas from City Street and County Highway Crews, Law Enforcement, or other sources. Information routed to the EMA Director through E911 • FREP Coordinators make notifications on Figure 2.1 using the pre-scripted messages in Section 2.2 <p>B. Monitor Data & Conditions</p> <ul style="list-style-type: none"> • FREP Coordinator (EMA Director) monitors USGS stream gages and NWS flood forecast resources (refer to Section 1) • FREP Coordinator (Fire Chief) confirms flood-safe routes have been run by the Street and County Highway Crews (refer to Exhibit 5 for routes) <ul style="list-style-type: none"> ○ Ensure Crews have cleaned storm inlets and flood-safe routes are free of standing water ○ Confirm Crews have installed “high water” signs and street barricades where needed and documented the location via E911 (use Exhibit 5 and pertinent information from Exhibit 1 as a guide) • FREP Coordinator (EMA Director) confirms County Highway has sandbags ready for pick up <p>C. Conduct Warning & Evacuation</p> <ul style="list-style-type: none"> • No warning above and beyond what is provided by the NWS and no evacuation during an Flood Stage (Minor Flood) Event <p>D. Record Observations & Actions</p> <ul style="list-style-type: none"> • FREP Coordinators confirm that all entities involved so far in the flood fight have recorded their information, observations, and actions using ICS Forms (Appendix B)
EVALUATION / DECISION
<p>FREP Coordinators evaluate the situation as events progress, or whenever conditions change. Use Table 1.1 determine whether:</p> <ul style="list-style-type: none"> A. The event can be terminated B. The event remains at the current Flood Stage (Minor) Event. C. The event warrants escalation to a Moderate Stage Flood Event <p>Based on this determination, follow the appropriate actions below.</p>

Flood Response and Evacuation Plan

A) TERMINATE EVENT	B) EVENT REMAINS CURRENT	C) EVENT ESCALATES
Go to Termination and Follow-up (Section 4)	Continue recommended actions on this sheet	Go to Notification Flow Chart (Figure 2.1)

ACTION DATA SHEET 3.3
EXPECTED ACTIONS
Moderate Flood Event

ACTIONS

A. Determine Areas Affected & Make Notifications

- FREP Coordinator (EMA Director) determines areas affected by flooding based on:
 - Procedure outlined in Section 1.5
 - Observation of flooding in low-lying areas from City Street and County Highway Crews, Law Enforcement, or other sources. Information routed to the EMA Director through E911
 - Flood prone area maps and supporting tables (Appendix E) with assistance, as needed, from the Planning Department Floodplain Administrator
- FREP Coordinators make notifications on Figure 2.1 using the pre-scripted messages in Section 2.2
- FREP Coordinator (EMA Director) confirms the EMA has opened the EOC and assembled the Flood Fight Team

B. Monitor Data & Conditions

- FREP Coordinator (EMA Director) monitors USGS stream gages and NWS flood forecast resources (refer to Section 1)
- FREP Coordinator (Fire Chief) confirms flood-safe routes have been run by the Street and County Highway Crews (refer to Exhibit 5 for routes)
 - Ensure Crews have cleaned storm inlets and flood-safe routes are free of standing water
 - Confirm Crews have installed “high water” signs and street barricades where needed and documented the location via E911 (use Exhibit 5 and pertinent information from Exhibits 1 through 4 as a guide)
- FREP Coordinator (EMA Director) confirms County Highway has sandbags ready for pick up

C. Conduct Warning & Evacuation

- FREP Coordinator (Fire Chief) identifies impassable roads (Exhibit 1 thru Exhibit 4) and confirms with Street and County Highway Crews as well as emergency responders (Police, Fire, Sheriff) via E911
- FREP Coordinator (Fire Chief) confirms flood-safe routes (Exhibit 5) are clear based on reports from Street and County Highway Crews via E911
- FREP Coordinators (Fire Chief & EMA Director) identifies affected public and the need to prepare for evacuation or shelter-in-place, as appropriate (Exhibit 1 thru Exhibit 4 and tables and depth maps in Appendix E as well as areas listed on AHPS)
- FREP Coordinator (EMA Director) confirms with Red Cross that shelters have been identified and they are ready to receive the affected public
- FREP Coordinator (EMA Director) confirms with E911 that City transit and school buses are available for evacuation if needed

<ul style="list-style-type: none"> • FREP Coordinator (Fire Chief) confirms with Public Safety PIO that mass notification message has been sent to affected public via E911 and media outlets • FREP Coordinator (EMA Director) confirms Planning Department Floodplain Administrator has initiated post-flood damage data collection (aerial photography, high water marks, etc. as noted in Appendix F-3) <p>D. Record Observations & Actions</p> <ul style="list-style-type: none"> • FREP Coordinators confirm that all entities involved so far in the flood fight have recorded their information, observations, and actions using ICS Forms (Appendix B) 		
EVALUATION / DECISION		
<p>FREP Coordinators evaluate the situation as events progress, or whenever conditions change. Use Table 1.2 determine whether:</p> <ul style="list-style-type: none"> A. The event warrants downgrade to Flood Stage (Minor) Event. Contacts on Figure 2.1 Notification Flow Chart shall be notified of downgrade. B. The event remains at the current Moderate Stage Flood Event. C. The event warrants escalation to Major Stage Flood Event. <p>Based on this determination, follow the appropriate actions below.</p>		
A) DOWNGRADE EVENT	B) EVENT REMAINS CURRENT	C) EVENT ESCALATES
Go to Notification Flow Chart (Figure 2.1)	Continue recommended actions on this sheet	Go to Notification Flow Chart (Figure 2.1)

ACTION DATA SHEET 3.4
EXPECTED ACTIONS
Major Flood Event

ACTIONS
<p>A. Determine Areas Affected & Make Notifications</p> <ul style="list-style-type: none">• FREP Coordinator (EMA Director) determines areas affected by flooding based on:<ul style="list-style-type: none">○ Procedure outlined in Section 1.5○ Observation of flooding in low-lying areas from City Street and County Highway Crews, Law Enforcement, or other sources. Information routed to the EMA Director through E911○ Flood prone area maps and supporting tables (Appendix E)• FREP Coordinators make notifications on Figure 2.1 using the pre-scripted messages in Section 2.2 <p>B. Monitor Data & Conditions</p> <ul style="list-style-type: none">• FREP Coordinator (EMA Director) monitors USGS stream gages and NWS flood forecast resources for the affected areas (refer to Section 1)• FREP Coordinator (Fire Chief) confirms flood-safe routes have been run by the Street and County Highway Crews (Exhibit 5)<ul style="list-style-type: none">○ Ensure Crews have cleaned storm inlets and flood-safe routes are free of standing water○ Confirm Crews have installed “high water” signs and street barricades where needed and documented the location via E911 (use Exhibit 5 and pertinent information from Exhibits 1 through 4 as a guide) <p>C. Conduct Warning & Evacuation</p> <ul style="list-style-type: none">• FREP Coordinator (Fire Chief) identifies impassable roads (Exhibit 1 thru Exhibit 4) and confirms with Street and County Highway Crews as well as emergency responders (Police, Fire, Sheriff) via E911• FREP Coordinator (Fire Chief) confirms flood-safe routes (Exhibit 5) are clear based on reports from Street and County Highway Crews via E911• FREP Coordinators (Fire Chief & EMA Director) identifies the affected public and the need to prepare for evacuation or shelter-in-place, as appropriate (Exhibit 1 thru Exhibit 4 and tables and depth maps in Appendix E as well as areas listed on AHPS)• FREP Coordinator (EMA Director) confirms with Red Cross that shelters are open and able to receive the affected public and pets• FREP Coordinator (EMA Director) confirms with E911 that City transit and school buses are available for evacuation if needed• FREP Coordinator (Fire Chief) confirms with Public Safety PIO that mass notification message has been sent to affected public via E911 and media outlets• FREP Coordinator (EMA Director) confirms that the Planning Department Floodplain Administrator is gathering flood data for post-flood damage data collection (aerial photography, high water marks, etc. as noted in Appendix F-3)

D. Record Observations & Actions

- FREP Coordinators confirms that all entities involved so far in the flood fight have recorded their information, observations, and actions using ICS Forms (Appendix B)

EVALUATION / DECISION

FREP Coordinators evaluate the situation as events progress, or whenever conditions change. Determine whether:

- A. The event warrants downgrade to Moderate Stage Flood Event. Contacts on Figure 2.2 Notification Flow Chart shall be notified of downgrade.
- B. The event remains at the current Major Stage Flood Event.

Based on this determination, follow the appropriate actions below.

A) DOWNGRADE EVENT	B) EVENT REMAINS CURRENT	
Go to Notification Flow Chart (Figure 2.1)	Continue recommended actions on this sheet	

SECTION 4

TERMINATION AND FOLLOW-UP

Once FREP operations have begun, the FREP operations must eventually be terminated and follow-up procedures completed. As shown on Figure i, FREP operations can only be terminated after completing operations under an Action Stage Flood Event or a Flood Stage (Minor Flood) Event.

4.1 Termination of the Flood Fight & Follow-up Responsibilities

The FREP Coordinators are responsible for terminating the flooding event; notifying and initiating the recovery and debris removal process. The following actions for follow-up may vary depending on the flood event detected.

- A. FREP Coordinators terminate the flood fight effort
- B. FREP Coordinators make notifications on Figure 2.1 and ensure the Public Safety PIO has notified the general and affected public that the flood event has been terminated and that possible flooding of structures and roads along rivers and in low-lying areas may have occurred and information about re-entry to evacuated areas (if applicable).
- C. FREP Coordinators (Fire Chief) confirms flood-safe routes have been run by the Street and County Highway Crews (Exhibit 5) and ensure storm inlets have been cleaned and routes are free of standing water. As standing water subsides, ensure Crews have collected “high water” signs and street barricades from impassable roads and that storm inlets and travel lanes on these roads are now clear for use.
- D. If areas were evacuated, FREP Coordinators (Fire Chief and EMA Director) determine if re-entry is possible and if so:
 - FREP Coordinator (Fire Chief) confirms the Public Safety PIO has notified the affected public
 - FREP Coordinator (EMA Director) confirms with Red Cross that shelters are closed
- E. FREP Coordinator (EMA Director) initiates damage assessment:
 - Engineering Department evaluates affected bridges and culverts for visible damage and blockage and documents/photographs conditions
 - Surveyor’s Office identifies and documents/photographs high water marks using the protocol outlined in Appendix F
 - If structures were flooded, EMA, Planning Department Floodplain Administrator, and Code Enforcement Department should evaluate damage to flooded structures using the Post-Flood Damage Assessment Protocol (Appendix F)
- F. FREP Coordinator (EMA Director) ensures Street Department and County Highway Crews collect and dispose of flood-related debris
- G. FREP Coordinator (EMA Director) confirms EMA has closed the EOC as appropriate.
- H. FREP Coordinator (EMA Director) directs the County Highway to restock the sandbag supply and for both the Highway and Street Department, to restock and repair damaged “high water” signs and barricades
- I. FREP Coordinators confirm all information, observations, and actions on the ICS Forms (Appendix B) have been properly documented.

- J. FREP Coordinators conduct a flood fight debrief (within 7 days of termination of the flood fight effort) that includes representative staff involved in decision-making and expected actions to discuss the FREP procedures that were followed effectively, as well as ways to that the FREP could be improved.
- K. FREP Coordinators summarize the information recorded during the flood fight (within 14 days of the termination of the flood fight effort) including the discussion from the flood fight debrief, and expenditures (possible FEMA reimbursement). This summary should be added to Appendix H.