

RESOLUTION NO. _____

A RESOLUTION AUTHORIZING THE MAYOR TO AMEND THE AGREEMENT WITH THE U.S. ARMY CORPS OF ENGINEERS (“USACE”) RELATIVE TO THE FLOOD PLAIN MANAGEMENT SERVICES PROGRAM, CONTRACT NO. S-13-004, CITICO AND MOUNTAIN CREEK WATERSHEDS AND OTHER MINOR UNNAMED TRIBUTARIES, FOR USACE TO PERFORM MODELING ON THIRTY-TWO (32) ADDITIONAL TRIBUTARY MILES IN CHATTANOOGA, AND AUTHORIZING AN ADDITIONAL FIFTY PERCENT (50%) MATCHING FUNDS, IN THE AMOUNT OF FIFTY-TWO THOUSAND DOLLARS (\$52,000.00), FOR REVISED TOTAL MATCHING FUNDS OF ONE HUNDRED FIFTY-SEVEN THOUSAND DOLLARS (\$157,000.00).

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CHATTANOOGA, it is hereby authorizing the Mayor to amend the agreement with the U.S. Army Corps of Engineers (“USACE”) relative to the Flood Plain Management Services Program, Contract No. S-13-004, Citico and Mountain Creek Watersheds and other minor unnamed tributaries, for USACE to perform modeling on 32 additional tributary miles in Chattanooga, and authorizing an additional 50% matching funds, in the amount of \$52,000.00, for revised total matching funds of \$157,000.00.

ADOPTED: _____, 2014

/mem

City of Chattanooga



Resolution Request Form

(This form is only required for resolutions requiring expenditure of City funds)

Date: November 12, 2014

Preparer: William C. Payne

Department: Public Works

Brief Description of Purpose for Resolution:

Resolution Number (if approved by Council): City-Wide

A City Council Action is requested to authorize the Mayor to amend the agreement with the U.S. Army of Corps of Engineers relative to the Flood Plain Management Services Program, Contract No. S-13-004, Citico & Mountain Creek Watersheds and other minor unnamed tributaries, for USACE to perform modeling on 32 additional tributary miles in Chattanooga, and authorizing additional 50% matching funds in the amount of \$52,000, for revised total matching funds of \$157,000.

Name of Vendor/Contractor/Grant, etc.	<u>US Army Corp of Engineers</u>	New Contract/Project? (Yes or No)	<u>No</u>
Total project cost \$	<u>157,000.00</u>	Funds Budgeted? (YES or NO)	<u>Yes</u>
Total City of Chattanooga Portion \$	<u>157,000.00</u>	Provide Fund	<u>6031</u>
City Amount Funded \$	<u>157,000.00</u>	Provide Cost Center	<u>K80111</u>
New City Funding Required \$	<u>0</u>	Proposed Funding Source if not budgeted	<u>N/A</u>
City's Match Percentage %	<u>50%</u>	Grant Period (if applicable)	<u>N/A</u>

List all other funding sources and amount for each contributor.

<u>Amount(s)</u>	<u>Grantor(s)</u>

Agency Grant Number _____

CFDA Number if known _____

Other comments: (Include contingency amount, contractor, and other information useful in preparing resolution)

Approved by: _____

Reviewed by: FINANCE OFFICE

DESIGNATED OFFICIAL/ADMINISTRATOR

Please submit completed form to @budget, City Attorney and City Finance Officer



DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1070
NASHVILLE TN 37202-1070

REPLY TO
ATTENTION OF

Project Planning Branch

Mayor Andy Berke
Public Works Administrator/Mayor
City of Chattanooga
101 East 11th Street
Chattanooga, Tennessee 37402

Dear Mayor Berke:

I am writing to request the City of Chattanooga's concurrence on the change in scope of work and requisite increase in estimated costs for work being done for Phase II of the multi-agency Chattanooga Flood Preparedness project. Chattanooga's agreement with the Nashville District, U.S. Army Corps of Engineers requires consent from the City anytime the original Scope of Work and associated Study Costs are changed. Specifically, Article I.D. of the Planning Assistance to States (PAS) Agreement between the Corps and Chattanooga, dated August 12, 2013, allows the parties to change scope of work and increase the total study cost by mutual consent. This letter serves as that consent.

The attached scope of work adds an additional task, task 6, for updates to flood insurance studies (FIS) for the watersheds of the flood preparedness study. This information will be provided to the Federal Emergency Management Agency (FEMA) for their FIS update through the letter of map revision (LOMR) process. Once the City concurs, we are requesting Chattanooga's share of the new estimated costs amounting to \$52,000.

Your signature on this letter will constitute understanding of the increased costs and represent concurrence with the new scope of work. The Project Management Plan will be amended to reflect these new estimated costs and they will be cost-shared according to the terms of the Agreement. This additional work is estimated to cost \$104,000. Chattanooga and Corps additional costs are \$52,000 each. The revised total cost of the agreement is \$314,000 or \$157,000 for each party.

Please indicate your agreement with this action by signing and dating below.

Sincerely,

William M. Wilson
Chief, Planning, Programs and
Project Management Division

Agreed:

Mayor Andy Berke

THE CITY OF CHATTANOOGA APPROVED AS TO PROJECT SCOPE:

Public Works Administrator: Donald L. Norris

APPROVED AS TO AVAILABLITIY OF FUNDS:

City Finance Officer

APPROVED AS TO FORM AND LEGALITY:

City Attorney: Wade Hinton

PM-P/Herbert
PM-P/Carrington
PM-P/Rote
OC/Firsching
PM-MP/Ragan
DPM/Wilson

Task 6. Update Flood Insurance Studies (FIS) for subject streams.

Chattanooga FIS Update Cost Estimate	
Stream	Miles
Lookout Creek	1.56
Black Creek	0.7
Chattanooga Creek	2.3
North Chickamauga Creek	16.7
Ninemile Creek	1.5
Mountain Creek	1.74
Mackey Branch	4.39
Ryall Springs Branch	3.43
Total	32.32*

*Projected Cost for FIS Update \$104,000.

**Attachment I -
Chattanooga Regional Flood Preparedness Study, Phase II
Planning Assistance to States (PAS) - Scope of Work
November 2014**

1. State/District/Project Location: Tennessee/Nashville District/Chattanooga and Hamilton County.

2. Background/Introduction/Project Objectives:

After middle and western Tennessee experienced record flooding in May 2010, the Tennessee Valley Authority (TVA) ran models of the Tennessee River with a storm of similar magnitude centered in eastern Tennessee, upstream of the City of Chattanooga (Chattanooga). The results indicate that if the May 2010 storm was centered just a few hundred miles to the east and south, the flooding in Chattanooga would exceed that experienced in the City of Nashville (Nashville), where damages were greater than \$2 billion and eleven fatalities occurred. This captured Chattanooga's attention and that of a group of federal and state agencies that had met to further the Silver Jackets initiative in Tennessee. The group recommended Chattanooga be considered as the next focus area for a multi-agency approach to flood preparedness. Nashville has been the focus of an aggressive flood risk management venture that includes multiple federal, state and local agencies to address the weaknesses in Nashville's flood preparedness.

The Chattanooga initiative has built upon the lessons learned in Nashville and focuses the efforts of a group of federal, state, and local partners on managing flood risk in the Chattanooga and Hamilton County area. Federal partners committed to the effort include TVA, National Weather Service (NWS) offices in Nashville and Morristown, Tennessee and the Ohio River Forecast Center, US Geological Survey (USGS) and US Army Corps of Engineers (USACE) Nashville District. State partners include the Tennessee Emergency Management Agency (TEMA) and Tennessee Department of Transportation (TDOT). Local partners include Nashville (who will share lessons learned) and the following cities in Hamilton County: Chattanooga, East Ridge, East Brainerd, Collegedale, Red Bank, Lookout Mountain, and Signal Mountain. Additionally, communities in north Georgia including Walker and Catoosa Counties and the cities of Ringgold and Fort Oglethorpe may participate.

This Planning Assistance to States (PAS) initiative builds upon the Silver Jackets Pilot Study and the Flood Plain Management Services (FPMS) Study, collectively called Phase I of the Chattanooga Regional Flood Preparedness Study. The goal of Phase I was to provide real time data and information to emergency management decision makers in the community in sufficient time to allow them to warn local residents and the media. Phase I developed static inundation products for the Tennessee River Chattanooga and for streams in the South Chickamauga Creek Watershed. Concurrent with development of these modeling products is the development of a web-based viewer and improvements in the real-time gauging and data retrieving process. Lastly, ongoing goals of the Chattanooga Regional Flood Preparedness Study include increasing coverage of these products to the rest of Chattanooga and ultimately developing HEC-RTS models for these areas, including Phase I areas.

Goals of Phase II, to be completed under USACE's PAS authority, are to 1) develop static inundation and timing products for Chattanooga Creek, Citico Creek, Mountain Creek, and Local Tributaries; 2) support the continued development of the web-based viewer or other interface with the flood preparedness data 3) support the continued development of the gage network and corresponding real time data retrieval 4) continue to develop the study team and established lines of communication for the future. The remaining goals of Phase II will be completed under USACE's FPMS Authority pursuant to a separate agreement between the parties (N. Chickamauga and Lookout Creek, pilot basin to develop HEC-RTS in Chattanooga).

3. Work to Be Performed/Tasks/Deliverables:

Task 1. Develop flood preparedness information for the Chattanooga Creek Watershed.

Chattanooga Creek poses a significant risk to human life and property. It flows about 15.1 miles from Catoosa County, Georgia through multiple political jurisdictions to the Tennessee River. The watershed is about 75 square miles. The following streams will be included in the analysis: Chattanooga Creek (8 miles to limits of existing study), Left Bank Trib in the vicinity of Charger Drive (1 mile), Left Bank Trib in the Vicinity of Tennessee Avenue (1 mile), and Dobbs Branch (5.1 miles). The analysis will include collecting data, assessing existing models and GIS information, and updating and connecting the models such that they can be used to develop inundation scenarios and later for Real Time Simulation (RTS) Modeling. New hydrologic modeling for the entire watershed will also be developed. The hydraulic models will be used to develop flood alert inundation mapping for the Tennessee portion of the watershed, referenced to stream gages for five flood alert categories (No Action, Action, Flood Stage, Moderate Stage and Major Stage) where the appropriate data is available.

Deliverables: The following products will be delivered for the Chattanooga Creek Watershed for the action levels, or alert categories. All Geographical Information System (GIS) data for the Chattanooga Creek Watershed will be provided in the Universal Transverse Mercator Zone 16 (UTM16 NAD83) horizontal map projection and North

American Vertical Datum of 1988 (NAVD 88).

- Flood alert level inundation GIS Data (water surface, depth, and area)
- Inundation data will be based on the most recent City of Chattanooga-provided LIDAR
- Hydrologic and Hydraulic Analysis Summary Report

Task 2: Develop flood preparedness information for Citico Creek Watershed.

Citico Creek is 2.9 miles in length and has a drainage area of 3 square miles. Citico Creek (2.9 miles) will be the only stream included in the analysis. The analysis will include collecting data, assessing existing models and GIS information, and updating and connecting the models such that they can be used to develop inundation scenarios and later for Real Time Simulation (RTS) Modeling. New hydrologic modeling for the entire watershed will also be developed. The hydraulic models will be used to develop flood alert inundation mapping for the watershed, referenced to stream gages for five flood alert categories (No Action, Action, Flood Stage, Moderate Stage and Major Stage) where the appropriate data is available.

Deliverables: See Task 1 for deliverable list. Note, we will add additional watersheds if funding allows.

Task 3. Develop flood preparedness information for Mountain Creek Watershed.

Mountain Creek is 4.6 miles in length and has a drainage area of 13.3 square miles. Mountain Creek (4.6 miles) will be the only stream included in the analysis. The analysis will include collecting data, assessing existing models and GIS information, and updating and connecting the models such that they can be used to develop inundation scenarios and later for Real Time Simulation (RTS) Modeling. New hydrologic modeling for the entire watershed will also be developed. The hydraulic models will be used to develop flood alert inundation mapping for the watershed, referenced to stream gages for five flood alert categories (No Action, Action, Flood Stage, Moderate Stage and Major Stage).

Deliverables: See Task 1 for deliverable list. Note, we will add additional watersheds if funding allows.

Task 4. Develop flood preparedness information for Minor Local Tributaries.

This task involves developing flood preparedness and inundation information for minor local tributaries to the Tennessee River in Chattanooga. These tributaries are: Trib in the vicinity of Ogrady Drive (4 miles), North Market Street Branch (1.7 miles), Trib in the vicinity of Altamont Road (1.9 miles), Trib in the vicinity of Ashland Terrace (3.8 miles), and Trib in the vicinity of Dupont Parkway (2.2 miles). These local tributaries drain a total area of 7.42 square miles. The analysis will include collecting data, assessing existing models and GIS information, and updating and connecting the models such that they can be used to develop inundation scenarios and later for Real Time Simulation (RTS) Modeling. New hydrologic modeling for the entire watershed will also be developed. The hydraulic models will be used to develop flood alert inundation mapping for the watershed, referenced to stream gages for five flood alert categories (No Action, Action, Flood Stage, Moderate Stage and Major Stage).

Deliverables: See Task 1 for deliverable list. Note, we will add additional watersheds if funding allows.

Task 5. Coordination and Communication. Develop and maintain multi-agency/multi-community team to promote and advance flood preparedness in the Chattanooga. The team will include all the partners involved in this proposal and reach out to the other cities in Hamilton County and those communities in north Georgia in the Tennessee River Basin. One goal will be to maximize the use of the tools being developed and maximize the sharing of information and resources. Another goal will be to facilitate communication between federal, state and local agencies before an emergency which will help the communication during an emergency.

Task 6. Flood Insurance Study (FIS) Updates.

Prepare Hydrologic and Hydraulic Data for FEMA Submittal: Study data will be compiled in a manner suitable for submission to the City of Chattanooga, TN and FEMA. It is assumed that the FEMA production technical services contractor will utilize the hydraulic models to develop floodplain and floodway mapping extents, as well as profiles for inclusion in the FIS report, via letter of map revision (LOMR) process and/or the Physical Map Revision (PMR) process.

Hydrologic Data

- Digital copies of all hydrologic modeling (input and output) files for all applicable return periods; HEC-HMS Models will be developed for execution from C:\hmsproj folder.
- Format Hydrology Database or Data Delivery consistent with the Data Capture Standards—Appendix N of the *Guidelines and Specifications for Flood Hazard Mapping Partners*, *NFIP Metadata Profiles Guidelines*, and *NFIP Metadata Profiles Specification*, both revised April 6, 2006; and
- For GIS-based modeling, deliverables shall include all input and output data, intermediate data processing products, and GIS data layers.
- Digital versions of backup data used in the analysis.
- Technical Hydrology reports for all of the streams.

Hydraulic Data

- Digital hydraulic modeling (input and output) files;
- Digital versions of all backup data used in the analyses;
- Format Hydraulic Database consistent with the Data Capture Standards—Appendix N of the *Guidelines and Specifications for Flood Hazard Mapping Partners*, *NFIP Metadata Profiles Guidelines*, and *NFIP Metadata Profiles Specification*, both revised April 6, 2006; and
- For GIS-based modeling, deliverables include all input and output data, intermediate data processing products, and GIS data layers
- Digital versions of the Floodway Data Table for each flooding source that is compatible with the DFIRM database;
- Explanations for unresolved messages from hydraulic model, as appropriate; for all streams.

Submittal Package

- Certified Topographic work maps and annotated FIRM panels for all streams.
- Technical Hydraulic reports for all streams.
- MT-2 Forms filled out for approval by the City of Chattanooga.
- Technical support for responding to and resolving FEMA review comments and changes to the submittal data.
- Support for public information meeting and other requirements related to the submittal process.

4. Project Delivery Team/Stake Holders Roles and Responsibilities:

Chattanooga will do the bridge surveys to support the USACE modeling efforts. Hamilton County, which has the primary responsibility for emergency warnings in the county, will participate with staff time and GIS support. In addition, they have an emergency warning system that can notify the public thru calls to home phones as well as registered cell phones. Nashville offered to share their Nashville SAFE tool with Chattanooga and share their lessons learned in the process of developing the tool and improving their flood preparedness. TVA has the primary responsibility for managing the Tennessee River and would assist with modeling, mapping and notifications. The USGS would assist Chattanooga and Hamilton County with review of their gauging programs, installation of new gages, coordination of hardware installation, and the reporting and managing of real time data. NWS would evaluate its forecast points and consider whether additional points are needed and if so would models be available for them to use. USACE Nashville District would share their experiences with the Morristown office, which forecasts for Chattanooga. TDOT would provide bridge data for model updates as well as supply gage and other data. TEMA would participate as a stakeholder.

The City of Chattanooga will approve and sign the FIS update submittal packages with the appropriate signatures to certify the submittals. Additionally, the City of Chattanooga will oversee the process of informing homeowners of potential changes to the FEMA floodplain boundaries.

5. Schedule/Milestones/Cost Estimate

Title	Cost (\$1000)		Schedule	
	Federal	Non-Federal*	Start	Finish
Scope and Agreement Negotiations				
Task 1 – Modeling and Inundation Layers for Chattanooga Creek	39.5	39.5		
Task 2 – Modeling and Inundation Layers for Citico Creek Watershed	11	11		
Task 3 – Modeling and Inundation Layers for Mountain Creek Watershed	19	19		
Task 4 – Modeling and Inundation Layers for Minor Local Tributaries	28.5	28.5		
Task 5 – Coordination & Communication	<u>7</u>	<u>7</u>		
Total	105	105		

6. Task 6 Milestone/Cost Estimate

Chattanooga FIS Update Cost Estimate	
Stream	Miles
Lookout Creek	1.56
Black Creek	0.7
Chattanooga Creek	2.3
North Chickamauga Creek	16.7
Ninemile Creek	1.5
Mountain Creek	1.74
Mackey Branch	4.39
Ryall Springs Branch	3.43
Total	32.32*

*Projected Cost for FIS Update \$104,000. Cost-share is 50% Federal, 50% City.