



City of Jonesboro, Arkansas
**COOPERATING TECHNICAL PARTNERS
 MAPPING ACTIVITY STATEMENT**

Mapping Activity Statement No. 1 – Digital Flood Insurance Rate Map Production and Development of Updated Flood Data

In accordance with the Cooperating Technical Partners (CTP) Partnership Agreement dated August 5, 2004 between the City of Jonesboro, Arkansas in Craighead County and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement (MAS) No. 1 is as follows.

Section 1—Objective and Scope

The objective of the Flood Map Project documented in this MAS is to develop information for the City of Jonesboro, Arkansas to be incorporated into a Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report for Craighead County, Arkansas. The DFIRM and FIS report will be produced in the FEMA Countywide Format.

To accomplish this objective, the Mapping Partners involved in this project will develop new and/or updated flood hazard data, as summarized in the table below.

| Flooding Source | Reach Limits | Hydrologic Analyses | Hydraulic Analyses | Floodplain Mapping | Redelineation Using Effective Flood Profiles and Updated Topographic Data | Refinement or Creation of Zone A |
|--------------------------------|---|---------------------|--------------------|--------------------|---|----------------------------------|
| Christian Creek | Confluence w/ Lost Creek to Cherrywood Dr. | X | X | X | | |
| Christian Creek Lateral | Christian Creek at County Rd. to Clubhouse St. | X | X | X | | |
| Lost Creek | Confluence w/ Big Creek Ditch to County-City boundary | X | X | X | | |
| Big Creek Ditch | West City boundary to North City-County boundary | X | X | X | | AE and A to become only AE |
| Moore's Ditch | Lateral No. 3 to Road 332 | X | X | X | | |
| Lateral No. 3 of Moore's Ditch | Little Bay Ditch to Jonesboro Airport | X | X | X | | |
| Moore's Ditch Lateral | Moore's Ditch to Jonesboro Airport | X | X | X | | |
| Roger's Bayou / | Area inside Jonesboro | X | X | X | | Refining A to AE with |

EMT-2004-CA-0123

| Davis Branch | corporate limits | | | | | detailed methods |
|---------------------------------------|--|---|-------------------------|--------------------|---|--|
| Unnamed Airport Tributary | Hwy 332 to St. Louis SW RR | X | X | X | | Refining A to AE with detailed methods |
| *Turtle Creek | Confluence w/ Whiteman's Creek at Willow Rd. to US Hwy 49 | | * Floodway and Profiles | * Floodway mapping | | |
| *Turtle Creek Lateral | Confluence w/ Turtle Creek at RR to Aggie Rd. | | * Floodway and Profiles | * Floodway mapping | | |
| * Lateral No. 5 (to Turtle Creek) | Confluence w/ Turtle Creek at Vans Ave. to Belt St. | | * Floodway and Profiles | * Floodway mapping | | |
| * Whiteman's Creek | Highway 143 at FIS lettered XS A to Wilkin Dr. | | * Floodway and Profiles | * Floodway mapping | | |
| *Higginbottom Creek | Viney Slough and Hwy 143 to U/S of Parkview St. | | * Floodway and Profiles | * Floodway mapping | | |
| * Unnamed Tributaries to Viney Slough | Viney Slough Ditch to Business Rd. 1 | | * Floodway and Profiles | * Floodway mapping | | |
| Spoil Bank | Along corporate limits of City of Jonesboro in area where new topographic data available | | | | X | |
| Viney Slough Ditch | Along corporate limits of City of Jonesboro in area where new topographic data available | | | | X | |
| Little Bay Ditch | Along corporate limits of City of Jonesboro in area where new topographic data available | | | | X | |
| Butler's Ditch | Along corporate limits of City of Jonesboro in area where new topographic data available | | | | X | |
| Maple Slough | Along corporate limits of City of | | | | X | |

| | | | | | | |
|-------|--|--|--|--|--|--|
| Ditch | Jonesboro in area where new topographic data available | | | | | |
|-------|--|--|--|--|--|--|

Within 30 days of this agreement, the CTP, in coordination with the National Service Provider (NSP), shall provide the final scope of work to be put into the FEMA Scoping tool as part of the Craighead County Scoping project. This also includes information concerning community ordinance data, local GIS data availability and the flood reach data for existing and proposed conditions.

The CTP/IDIQ shall notify FEMA and the NSP by e-mail of all meetings with community officials at least one week prior to the meeting. FEMA and/or the NSP may or may not attend the community meetings.

The following will complete this Flood Map Project:

- The City of Jonesboro, Arkansas:
- Carter and Burgess, Inc. (CTP Contractor): and
- Michael Baker, Jr. (FEMA NSP).

The activities for this Flood Map Project, including required Quality Assurance/Quality Control (QA/QC) reviews, and the Mapping Partners that will complete them are summarized in Table 1-1. All activities that are to be accomplished by the City of Jonesboro, Arkansas, or contractors to the City of Jonesboro, including contractors that may be selected after the project startup, are included in the "CTP" column. The sections of this MAS that follow Table 1-1 describe the specific activities, responsible Mapping Partner(s), FEMA standards that must be met, and resultant map components.

Table 1-1. Summary of Project Activities and Assignments

| Activities | CTP | FEMA (SC) | FEMA (NSP) |
|---|-----|-----------|------------|
| Activity 3 – Field Surveys and Reconnaissance | X | | |
| Activity 6 –Hydrologic Analyses | X | | |
| Activity 7–Independent QA/QC Review of Hydrologic Analyses | | | X |
| Activity 8 – Hydraulic Analyses | X | | |
| Activity 9 – Independent QA/QC Review of Hydraulic Analyses | | | X |
| Activity 10 – Floodplain Mapping (Detailed Riverine or Coastal Analysis) | X | | |
| Activity 10A – Floodplain Mapping (Redelineation Using Effective Flood Profiles and Updated Topographic Data) | X | | |
| Activity 10B – Floodplain Mapping (Refinement or Creation of Zone A) | | | |
| Activity 11 – Independent QA/QC Review of Floodplain Mapping (Revised Areas) | | | X |
| Activity 12 – Base Map Acquisition | | | |
| Activity 13 – DFIRM Production (Non-Revised Areas) | X | | |

| Activities | CTP | FEMA (SC) | FEMA (NSP) |
|--|-----|-----------|------------|
| Activity 13A – Independent QA/QC Review of DFIRM Production (Non-Revised Areas) | | | X |
| Activity 14 – DFIRM Production (Merging Revised and Non-Revised Information) | X | | |
| Activity 14A – DFIRM Production (Application of FEMA Graphics and Database Specifications) | | | |
| Activity 14B – Independent QA/QC Review of DFIRM Product Meeting FEMA Graphics and Database Specifications | | | X |
| Activity 15 – Preliminary DFIRM and FIS Report Distribution | | | |
| Activity 16 – Post-Preliminary Processing | | | |
| Activity 17 – Outreach | X | | |

FEMA has developed tools to assist in the development of the flood hazard data studies and the Digital Flood Insurance Rate Maps (DFIRMs). FEMA will, through the NSP, provide all CTPs access to and training in these tools. The tools available at this time include WISE software and the DFIRM production tools. If the CTP chooses not to use these production tools, then the CTP will be required to submit intermediate project data at major milestones in each Mapping Project in accordance with Appendix N: Data Capture Standards. Submitting data in these standards will aid in more efficient quality control reviews, data storage, archiving, and for future study updates. The Data Capture Standards and Guidelines submittals will be required at the following study milestones:

- Field Survey Completed
- Hydrology Completed (draft and final)
- Hydraulics Completed (draft and final)
- DFIRM Mapping (draft and preliminary)

QA/QC review activities may be performed by CTPs or the NSP at the discretion of FEMA. Please note the NSP will also be performing periodic audits and overall study/project management to ensure study quality.

FEMA will be providing download/upload capability for submittals through the Management Information Portal (MIP). Data submittals uploaded via the MIP, will include the same data required prior to the existence of the MIP.

Activity 3 - Field Surveys and Reconnaissance

Responsible Mapping Partner: City of Jonesboro's (CTP's) contractor, Carter & Burgess, Inc. and subcontractors to Carter & Burgess, Inc.

Scope: Carter & Burgess, Inc. or subcontractors to Carter & Burgess, Inc. shall conduct a detailed field reconnaissance of the specific study area to determine conditions along the floodplain(s), types and numbers of hydraulic and/or flood-control structures, apparent maintenance or lack thereof of existing hydraulic structures, locations of cross sections to be surveyed, and other parameters needed for the hydrologic and hydraulic analyses.

In addition the field reconnaissance, Carter & Burgess, Inc. or subcontractors to Carter & Burgess, Inc. shall conduct field surveys, including obtaining channel and floodplain cross sections, identifying or establishing Temporary Bench Marks, and obtaining the physical dimensions of hydraulic and flood-control structures.

Carter & Burgess, Inc. or subcontractors to Carter & Burgess, Inc. will conduct field surveys on the following creeks listed in the table below for this MAS:

Table 1-2: Field Survey Streams

| Flooding Source | Reach Length (mi.) | Number of Structures | Number of Sections |
|----------------------------------|--------------------|----------------------|--------------------|
| Christian Creek | 3.98 | 16 | 21 |
| Christian Creek Lateral | 1.14 | 6 | 6 |
| Lost Creek | 7.01 | 15 | 37 |
| Big Creek Ditch | 2.84 | 5 | 15 |
| Moore's Ditch | 1.70 | 2 | 9 |
| Lateral No. 3 (of Moore's Ditch) | 3.79 | 10 | 20 |
| Moore's Ditch Lateral | 1.70 | 4 | 9 |
| Unnamed Airport Tributary | 1.14 | 4 | 6 |
| Roger's Bayou / Davis Branch | 2.08 | 7 | 11 |

Standards: All work under Activity 3 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the Technical Support Data Notebook (TSDN) format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, CTP or its' contractor(s) shall make the following products available to FEMA :

- A report summarizing the findings of the field reconnaissance;
- Maps and drawings that provide the detailed survey results; and
- Survey notebook containing cross sections and structural data;
- ASCII format point file of survey data as well as shapefile of the survey point data.
- NSP Format Survey Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards and Guidelines.

Draft Data Capture Standards can be downloaded from http://www.fema.gov/fhm/gs_main.shtm. As of the date of this MAS, the effective Intermediate Data Specifications are dated April 2004.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 6 – Hydrologic Analyses

Responsible Mapping Partner: City of Jonesboro's (CTP's) contractor, Carter & Burgess, Inc.

Scope: Carter & Burgess, Inc. shall perform hydrologic analyses for approximately 42 square miles of drainage area for the flooding source(s) identified at the beginning of this MAS. CTP or its' contractor(s) shall calculate peak flood discharges for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events using HEC-1 computer program. These flood discharges will be the basis for subsequent hydraulic analyses under Activity 8. In addition, CTP or its' contractor(s) shall address all concerns or questions regarding Activity 6 that are raised by the FEMA NSP during the independent QA/QC review under Activity 7.

Standards: All work under Activity 6 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of hydrologic modeling for Christian Creek, Christian Creek Lateral, Lost Creek, Big Creek Ditch, Moore's Ditch, Lateral No. 3 (of Moore's Ditch), Moore's Ditch Lateral, Unnamed Airport Tributary, Carter & Burgess, Inc. shall submit the results to FEMA NSP for an independent QA/QC review under Activity 7. Carter & Burgess, Inc. shall submit the results of the hydrologic analyses for the remaining flooding sources for a final QA/QC review at the completion of this activity. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, CTP or its' contractor(s) shall make the following products available to FEMA:

- Digital copies of all hydrologic modeling (input and output) files for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events;
- Digital and hardcopy versions of the Summary of Discharges Table presenting discharge data for the flooding sources for which hydrologic analyses were performed;
- Digital and hardcopy versions of draft text for Section 3.1, Hydrologic Analyses, of the FIS report; and
- Digital and hardcopy versions of all backup data used in the analysis, including work maps.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 7 - Independent QA/QC Review of Hydrologic Analyses

Responsible Mapping Partner: FEMA NSP

Scope: FEMA NSP shall review the technical, scientific, and other information submitted by the CTP (City of Jonesboro) under Activity 6 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practice and are sufficient to prepare the DFIRM. This work shall include, at a minimum, the activities listed below.

- Review the submittal for technical and regulatory adequacy, completeness of required information, and supporting data and documentation. The technical review is to focus on the following:
 - Use of acceptable models;
 - Use of appropriate methodology(ies);
 - Correctly applied methodology(ies)/model(s), including QC of input parameters;
 - Comparison with gage data and/or regression equations, if appropriate; and
 - Comparison with discharges for contiguous reaches or flooding sources.
- Maintain records of all contacts, reviews, recommendations, and actions and make them readily available to FEMA.
- Maintain an archive of all data submitted for hydrologic modeling review. (All supporting data must be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.)

Standards: All work under Activity 7 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, FEMA NSP shall make the following products available to FEMA:

- A Summary Report that describes the findings of the independent QA/QC review; and
- Recommendations to resolve any problems that are identified during the independent QA/QC review.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf

Activity 8 – Hydraulic Analyses

EMT-2004-CA-0123

Responsible Mapping Partner: City of Jonesboro's (CTP's) contractor, Carter & Burgess, Inc.

Scope: Carter & Burgess, Inc. shall perform hydraulic analyses for approximately 23.3 miles of the flooding sources identified at the beginning of this MAS. The modeling will include the 10-, 2-, 1-, and 0.2-percent-annual-chance events based on peak discharges computed under Activity 6. The hydraulic analysis methods used for this analysis will include HEC-GeoRAS and HEC-RAS.

Carter & Burgess, Inc. shall use the cross-section and field data collected under Activity 3 to perform the hydraulic analyses. The hydraulic analyses shall be used to establish flood elevations and regulatory floodways for the subject flooding sources.

Carter & Burgess, Inc. shall use the FEMA CHECK-RAS checking program to check the reasonableness of the hydraulic analyses. To facilitate the independent QA/QC review under Activity 9, the Carter & Burgess, Inc. shall provide explanations for unresolved messages from the CHECK-RAS program, as appropriate. In addition, Carter & Burgess, Inc. shall address all concerns or questions regarding Activity 8 that are raised by the FEMA NSP during the independent QA/QC review under Activity 9.

Standards: All work under Activity 8 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of hydraulic modeling for Christian Creek, Christian Creek Lateral, Lost Creek, Big Creek Ditch, Moore's Ditch, Lateral No. 3 (of Moore's Ditch), Moore's Ditch Lateral, Unnamed Airport Tributary; Carter & Burgess, Inc. shall submit the results to FEMA NSP for an independent QA/QC review under Activity 9. Carter & Burgess, Inc. shall submit the results of the hydraulic analyses for the remaining flooding sources for a final QA/QC review at the completion of this activity. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, Carter & Burgess, Inc. shall make the following products available to FEMA:

- Digital profiles of the 10-, 2-, 1- and 0.2-percent-annual-chance water-surface elevations representing existing conditions using the FEMA RASLOT program or similar software;
- Digital and hardcopy versions of the Floodway Data Table for each flooding source that is compatible with the DFIRM database;
- Digital and hardcopy versions of all hydraulic modeling (input and output) files;
- Digital and hardcopy versions of a table showing ranges of Manning's "n" values;
- Explanations for unresolved messages from the CHECK-RAS program, as appropriate;
- Digital and hardcopy versions of all backup data used in the analyses; and
- Digital and hardcopy versions of draft text for inclusion in the FIS report.

Draft Data Capture Standards can be downloaded from http://www.fema.gov/fhm/gs_main.shtm.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf

Activity 9 - Independent QA/QC Review of Hydraulic Analyses

Responsible Mapping Partner: FEMA NSP

Scope: FEMA NSP shall review the technical, scientific, and other information submitted by CTP (City of Jonesboro) under Activity 8 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practice and are sufficient to prepare the DFIRM. This work shall include, at a minimum, the activities listed below.

- Review the submittal for technical and regulatory adequacy, completeness of required information, and supporting data and documentation. The technical review is to focus on the following:

EMF-2004-CA-0123

- Use of acceptable model(s);
 - Starting water-surface elevations;
 - Cross-section geometry;
 - Manning's "n" values and expansion/contraction coefficients;
 - Bridge and culvert modeling;
 - Flood discharges;
 - Regulatory floodway computation methods; and
 - Tie-ins to upstream and downstream non-revised Flood Profiles.
- Use the CHECK-2 or CHECK-RAS program as appropriate to flag potential problems and focus review efforts.
 - Maintain records of all contacts, reviews, recommendations, and actions and make them readily available to FEMA.
 - Maintain an archive of all data submitted for hydraulic modeling review. (All supporting data must be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.)

Standards: All work under Activity 9 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, FEMA NSP shall make the following products available to FEMA:

- A Summary Report that describes the findings of the independent QA/QC review; and
- Recommendations to resolve any problems that are identified during the independent QA/QC review.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/firm_gsam.pdf.

Activity 10 - Floodplain Mapping (Detailed Riverine Analysis)

Responsible Mapping Partner: City of Jonesboro's (CTP's) contractor, Carter & Burgess, Inc.

Scope: Carter & Burgess, Inc. shall delineate the 1- and 0.2-percent-annual-chance floodplain boundaries and the regulatory floodway boundaries (if required) for the flooding sources for which detailed analyses were performed. Carter & Burgess, Inc. shall incorporate all new or revised modeling and shall use the topographic data acquired under Activity 4 to delineate the floodplain and regulatory floodway boundaries on a digital work map. In addition, Carter & Burgess, Inc. shall incorporate the results of all effective Letters of Map Change (LOMCs) within the revised areas as appropriate. Also, Carter & Burgess, Inc. shall address all concerns or questions regarding Activity 10 that are raised by the NSP during the independent QA/QC review under Activity 11.

Standards: All work under Activity 10 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of floodplain mapping for Christian Creek, Christian Creek Lateral, Lost Creek, Big Creek Ditch, Moore's Ditch, Lateral No. 3 (of Moore's Ditch), Moore's Ditch Lateral, Unnamed Airport Tributary; Carter & Burgess, Inc. shall submit the mapping to NSP for an independent QA/QC review under Activity 11. Carter & Burgess, Inc. shall submit the mapping for the remaining flooding sources for a final QA/QC review at the completion of this activity. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, Carter & Burgess, Inc. shall make the following products available to FEMA:

EMT-2004-CA-0123

- Digital work maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM; and
- Any backup or supplemental information used in the mapping required for the independent QA/QC review outlined under Activity 11;

Intermediate Format Mapping Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards and Guidelines.

Data Capture Standards and Guidelines can be downloaded from www.website.com.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/fm_gsam.pdf.

Activity 10A - Floodplain Mapping (Redelineation of Detailed Floodplain Boundaries Using Updated Topographic Data)

Responsible Mapping Partner: City of Jonesboro's (CTP's) contractor, Carter & Burgess, Inc.

Scope: Carter & Burgess, Inc. shall delineate the 1- and 0.2-percent-annual-chance floodplain boundaries and the regulatory floodway boundaries (if required) for the flooding sources identified at the beginning of this MAS. Carter & Burgess, Inc. shall use the topographic data acquired under Activity 4 to delineate the floodplain and regulatory floodway boundaries as appropriate on a digital work map. If the new topographic data do not reflect the same hydraulic characteristics as in the effective study, Carter & Burgess, Inc. shall evaluate the topographic data to determine if changes are significant enough to invalidate the floodplain boundary and regulatory floodway boundary redelineations. If so, Carter & Burgess, Inc. shall contact the FEMA Regional Project Officer identified in Section 13 of this MAS with a recommendation. In addition, Carter & Burgess, Inc. shall address all concerns or questions regarding Activity 10A that are raised by the FEMA NSP during the independent QA/QC review under Activity 11.

Standards: All work under Activity 10A shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of floodplain mapping for Spoil Bank, Little Bay Ditch, Viney Slough Ditch, Maple Slough Ditch, and Butler's Ditch; Carter & Burgess, Inc. shall submit the mapping to the FEMA NSP for an independent QA/QC review under Activity 11. Carter & Burgess, Inc. shall submit the mapping for the remaining flooding sources for a final QA/QC review at the completion of this activity. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, Carter & Burgess, Inc. shall make the following products available to FEMA:

- Digital work maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, flood insurance risk zone labels, and all applicable base map features;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;

EMT-2004-CA-0123

- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM;
- Any backup or supplemental information used in the mapping required for the independent QA/QC review outlined under Activity 11; and
- An explanation for the use of existing topography for the studied reaches, if appropriate;
- NSP Format Mapping Database or Intermediate Data Delivery consistent with the NSP Data Capture Standards and Guidelines.

Data Capture Standards and Guidelines can be downloaded from www.website.com.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/firm_gsam.pdf.

Activity 11 - Independent QA/QC Review of Floodplain Mapping (Revised Areas)

Responsible Mapping Partner: FEMA NSP

Scope: FEMA NSP shall review the floodplain mapping submitted by Carter & Burgess, Inc. under Activity 10 to ensure that the results of the analyses performed are accurately represented, the work maps are consistent with current FEMA standards, and the work maps are sufficient to prepare the DFIRM. This work shall include, at a minimum, the activities listed below.

- Review the cross sections for proper location and orientation on the work map and agreement with the Floodway Data Table.
- Review the BFEs shown on the work maps for proper location and agreement with the results of the hydraulic modeling.
- Review the regulatory floodway widths shown on the work maps for agreement with the widths shown in the Floodway Data Table and the results of the hydraulic modeling.
- Review the floodplain boundaries shown on the work maps or agreement with the flood elevations shown in the Floodway Data Table and the contour lines and other topographic information shown on the work maps.
- Review the floodplain widths at cross sections as shown on the work maps to ensure they match the Floodway Data Table.
- Review the floodplain boundaries as shown on the work maps to ensure they match the Flood Profiles.
- Review the flood insurance risk zones as shown on the work maps to ensure they are labeled properly.
- Review the DFIRM mapping files to ensure they were prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*.
- Review the metadata files to ensure they include all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*.

Standards: All work under Activity 11 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, NSP shall make the following products available to FEMA:

- A Summary Report that describes the findings of the QA/QC review, noting any deficiencies in or agreeing with the mapping results;
- Recommendations to resolve any problems that are identified during the independent QA/QC review; and

- An annotated work map with all questions and/or concerns indicated, if necessary.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 13 – DFIRM Production (Non-Revised Areas)

Responsible Mapping Partner: City of Jonesboro’s (CTP’s) contractor, Carter & Burgess, Inc.

Scope: For all flooding sources except those segments for which updated flood data will be developed under Activities 1 through 11, Carter & Burgess, Inc. shall convert the information shown on the effective FIRM and Flood Boundary Floodway Map (FBFM) panels for all of the incorporated areas of the City of Jonesboro, Arkansas to digital format in conformance with FEMA DFIRM specifications. Carter & Burgess, Inc. also shall incorporate the results of LOMCs issued by FEMA since the date of the current effective FIRM for each affected community.

Also, Carter & Burgess, Inc. shall address all comments and questions regarding Activity 13 that are raised by the FEMA NSP during the independent QA/QC review under Activity 13A.

Carter & Burgess, Inc. shall not digitize the flood theme for those segments of flooding sources for which updated flood data will be developed. Rather, Carter & Burgess, Inc. shall leave these as “holes” in the digital flood theme that will be filled in as part of Activity 14 using the digital flood data developed under Activities 10, 10A, and 10B.

Standards: All work under Activity 13 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: Upon completion of the digital flood data for the non-revised areas, Carter & Burgess, Inc. shall submit the work maps to the FEMA NSP for an independent QA/QC review under Activity 13A. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, Carter & Burgess, Inc. shall make the following products available to FEMA:

- Digital work maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM, including a check that the road and floodplain relationship is maintained for all non-revised areas.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 13A – Independent QA/QC Review of DFIRM Production (Non-Revised Areas)

Responsible Mapping Partner: FEMA NSP

Scope: The FEMA NSP shall review the DFIRM panels submitted by Carter & Burgess, Inc. under Activity 13 to ensure that the new DFIRM panels accurately represent the information shown on the effective FIRMs and FBFMs for the area mapped and are consistent with current FEMA standards. This work shall include, at a minimum, checking the following:

- Cross sections are properly located and oriented as shown on the FIRMs or FBFMs.
- BFEs are properly located and agree with the BFEs shown on the FIRMs.
- Regulatory floodway widths agree with the widths shown on the FIRMs or FBFMs.

EMT-2004-CA-0123

- The 1 and 0.2-percent-annual-chance floodplain boundaries agree with the floodplain boundaries shown on the DFIRM and the contour lines, other topographic information, and planimetric information shown on the DFIRM base.
- Road and floodplain relationships are maintained for all unrevised areas.
- DFIRM mapping files meet the GIS file and database format requirements specified in FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* and conform to those requirements for content and attribution.
- Metadata files describing the DFIRM data include the required information.

Standards: All work under Activity 13A shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the FEMA NSP shall make the following products available to FEMA:

- A Summary Report that describes the findings of the QA/QC review noting any deficiencies in or agreeing with the mapping results;
- Recommendations to resolve any problems that are identified during the independent QA/QC review; and
- An annotated copy of the DFIRM with all questions and/or concerns indicated, if necessary.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 14 – DFIRM Production (Merging Revised and Non-Revised Information)

Responsible Mapping Partner: City of Jonesboro's (CTP's) contractor, Carter & Burgess, Inc.

Scope: Upon completion of the floodplain mapping activities for the revised areas (Activities 10, 10A, and/or 10B) and the DFIRM production for non-revised areas (Activity 13), Carter & Burgess, Inc. shall merge the digital floodplain data into a single, updated DFIRM. This work is to include tie-in of flood hazard information for areas that were not studied as part of the Flood Map Project documented in this MAS. Carter & Burgess, Inc. also shall tie in the revised and non-revised Flood Profiles, floodplain boundaries, and regulatory floodway boundaries with contiguous areas in the City of Jonesboro and adjacent unincorporated areas to the corporate limits of the City of Jonesboro that were not studied as part of the Flood Map Project documented in this MAS. Carter & Burgess, Inc. shall coordinate with FEMA and those Mapping Partners responsible for Activities 10, 10A, 10B, and 13, as necessary, to resolve any potential tie-in issues.

Standards: All work under Activity 14 shall be performed in accordance with the standards specified in Section 5 of this MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, Carter & Burgess, Inc. shall make the following products available to FEMA:

- Digital work maps showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs;
- DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the DFIRM.

Appendix M may be downloaded from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf.

Activity 17—Outreach

Responsible Entity: CTP (City of Jonesboro)

Scope: The outreach activities for a Flood Map Project can best be understood as a process that begins during the Project Scoping phase and continues through the Map Production and Post-preliminary phases. A regulatory overview of required activities is followed by a description of tools that can be used in working with stakeholders to keep them informed and to solicit their input.

The overarching goal for conducting outreach is to create a climate of understanding and ownership of the mapping process at the State and local levels. Well-planned outreach activities can reduce political stress, confrontation in the media, and public controversy, which can arise from lack of information, misunderstanding, or misinformation. These outreach activities also can assist FEMA and other members of the Project Team in responding to congressional inquiries.

By proactively reaching out to all key stakeholders as early in the Flood Map Project as possible, the maps can be used to their full potential. The likelihood of appeals may also be reduced or eliminated. Specific Contractor activities shall include, but are not limited to -

- Establishing two-way communication to address the needs of, inform and obtain feedback from, the stakeholders;
- Ensuring compliance with due process requirements;
- Interacting with technical representatives to ensure production of accurate and up-to-date maps;
- Enhancing ownership by communities;
- Tracking, monitoring, and evaluating outreach activities and adjusting efforts according to ongoing feedback and evolving project needs.

Standards: All work conducted under this task shall conform to the standards specified for this task in Section 5, “Applicable Standards” of this SOW. In the event of any contradictions between the SOW and the standards, the standards shall control.

Deliverables: Upon Completion of Outreach and Coordination the Contractor shall deliver the following to the FEMA Regional Project Officer in accordance with the delivery dates specified in task orders:

- A report detailing outreach and coordination activities
- Backup or supplemental information used in writing this report

SECTION 2—TECHNICAL AND ADMINISTRATIVE SUPPORT DATA SUBMITTALS AND SPECIAL PROBLEM REPORTS

The Project Team members for this Flood Map Project that have responsibilities for activities included in this MAS shall comply with the data submittal requirements summarized below.

All supporting documentation for the activities in this MAS shall be submitted in the TSDN format in accordance with Appendix M of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners*, dated April 2003. Appendix M is available for viewing or download on the FEMA Web site at http://www.fema.gov/pdf/fhm/frm_gsam.pdf. Table 2-1 indicates the sections of the TSDN that apply to each mapping activity.

Table 2-1. Mapping Activities and Applicable TSDN Sections

| TSDN Section | 1. Mapping Activities | | | | | | | | | | | | | | | |
|--|-----------------------|---|---|---|---|--------------|--------------|---|---|----------------------------|----|----|------------|------------|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6, 6 A | 7, 7 A | 8 | 9 | 10, 10 A, 10 B | 11 | 12 | 13, 13A | 14, 14A | 15 | 16 |
| General Documentation | | | | | | | | | | | | | | | | |
| Special Problem Reports | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Telephone Conversation Reports | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Meeting Minutes Reports | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| General Correspondence | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Engineering Analyses | | | | | | | | | | | | | | | | |
| Hydrologic Analyses | | | X | | | X | X | X | X | X | X | | | | | |
| Hydraulic Analyses | | | X | | | X | X | X | X | X | X | | | | | |
| Key to Cross-Section Labeling | | | X | | | X | X | X | X | X | X | | | | | |
| Key to Transect Labeling | | | X | | | X | X | X | X | X | X | | | | | |
| Draft FIS Report | | | | | | X | X | X | X | | | | | | | |
| Mapping Information | X | X | | X | X | | | | | X | X | X | X | X | X | X |
| Miscellaneous Reference Information | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

If any issues arise that could affect the completion of an activity within the proposed scope or budget, the responsible Mapping Partner shall complete a Special Problem Report (SPR) as soon as possible after the issue is identified and submitted to FEMA. The SPR is to describe the issue and propose possible resolutions. (For additional information on SPRs, refer to Appendix M, Subsection M.2.1.1 of *Guidelines and Specifications for Flood Hazard Mapping Partners*.)

Additionally, the NSP shall collect and maintain a set of products for all Activities and shall compile a comprehensive TSDN for the entire project.

Section 3—Period of Performance

The mapping activities documented in this MAS will begin no earlier than September 1, 2004, and will be completed no later than September 30, 2006. The mapping activities may be terminated at the option of FEMA or the City of Jonesboro, Arkansas, in accordance with the provisions of the Partnership Agreement dated August 5, 2004.

Section 4—Funding/Cost-Sharing

FEMA [REDACTED] to the City of Jonesboro, Arkansas, for the completion of the Flood Map Project documented in this MAS. The City of Jonesboro, Arkansas, shall provide any additional resources required to complete the assigned activities for this Flood Map Project.

Section 5—Standards

The standards relevant to this MAS are provided in Tables 5-1 and 5-2. Information on the correct volume, appendix, section, or subsection of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners* to be referenced for each mapping activity are summarized in Table 5-2. These Guidelines are available for viewing or download from the FEMA Flood Hazard Mapping Web site at http://www.fema.gov/fhm/dl_cgs.shtm.

EMT-2004-CA-0123

In addition, intermediate data submission standards referenced in the previous sections are to be applied to the project for the data formats to be submitted to FEMA.

Table 5-1. Applicable Standards for Project Activities

| Applicable Standards | Activities | | | | | | | | | | | | | | | |
|---|------------|---|---|---|---|----------|----------|---|---|----------------------------|----|----|------------|------------|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6, 6A | 7, 7A | 8 | 9 | 10, 10 A, 10 B | 11 | 12 | 13, 13A | 14, 14A | 15 | 16 |
| <i>Guidelines and Specifications for Flood Hazard Mapping Partners</i> , April 2003 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| American Congress on Surveying and Mapping Procedures | X | X | X | X | X | | | | | | | | | | | |
| Global Positioning System (GPS) Surveys: National Geodetic Survey (NGS-510), "Guidelines for Establishing GPS-Derived Ellipsoid Heights," November 1997 | X | X | X | X | X | | | | | | | | | | | |
| Engineer Manual 1110-1-1000, <i>Photogrammetric Mapping</i> (USACE), July 1, 2002 | X | X | X | X | X | | | | | | | | | | | |
| Engineer Manual 1110-2-1003, <i>Hydrographic Surveys</i> (USACE), January 1, 2002 | X | X | X | | | | | | | | | | | | | |
| "Numerical Models Accepted by FEMA for NFIP Usage," Updated April 2003 | X | X | | | | X | X | X | X | | | | | | | |
| <i>Content Standard for Digital Geospatial Metadata</i> (Federal Geographic Data Committee), 1998 | X | X | | X | X | | | | | X | X | X | X | X | X | X |
| <i>Document Control Procedures</i> | X | X | | | | | | | | | | | | | X | X |

Mapping Activity Statement No. 1

Table 5-2. Project Activities and Applicable Portions of FEMA Guidelines and Specifications

| Activity Number | Activity Description | Applicable Volume, Section/Subsection, and Appendix |
|-----------------|---|--|
| 3 | Field Surveys and Reconnaissance | Volume 1, Section 1.4 (specifically Subsection 1.4.2.1) Appendix A, Sections A.4, A.5, A.6, A.7, and A.8 Appendix F, Section F.3 Appendices B, C, and M |
| 6 | Hydrologic Analyses | Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) Appendix A, Section A.4 Appendix C, Sections C.1 and C.7 Appendices E, F, G, H, and M |
| 7 | Independent QA/QC Review of Hydrologic Analyses | Volume 1, Section 1.4 (specifically Subsection 1.4.1) Appendix A, Section A.4 Appendix C, Section C.2 Appendices E, F, G, H, and M |
| 8 | Hydraulic Analyses | Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) Appendix A, Section A.4 (specifically Subsection A.4.7) Appendix C, Sections C.3 and C.7 Appendices B, E, F, G, H, and M |

Table 5-2. Project Activities and Applicable Portions of FEMA Guidelines and Specifications (Cont'd)

| Activity Number | Activity Description | Applicable Volume, Section/Subsection, and Appendix |
|-----------------|--|--|
| 9 | Independent QA/QC Review of Hydraulic Analyses | Volume 1, Section 1.4 (specifically Subsection 1.4.1) Appendix A, Section A.4 (specifically Subsection A.4.7) Appendix C, Section C.5 Appendices B, E, F, G, H, and M |
| 10 | Floodplain Mapping (Detailed Riverine or Coastal Analysis) | Volume 1, Section 1.4 (specifically Subsection 1.4.2.3) Appendix C, Sections C.4 and C.6 Appendix D, Sections D.2 (specifically Subsection D.2.7) and D.3 (specifically Subsection D.3.7) Appendices E, F, G, H, K, L, and M |
| 10A | Floodplain Mapping (Redelineation Using Effective Flood Profiles and Updated Topographic Data) | Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.3) Appendix C, Section C.6 (specifically Subsection C.6.1.3) Appendices K, L, and M |
| 11 | Independent QA/QC Review of Floodplain Mapping (Revised Areas) | Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.3) Appendix C, Sections C.4 and C.6 Appendix D, Sections D.2 (specifically Subsection D.2.7) and D.3 (specifically Subsection D.3.7) Appendices E, F, G, H, K, L, and M |

Table 5-2. Project Activities and Applicable Portions of FEMA Guidelines and Specifications (Cont'd)

| Activity Number | Activity Description | Applicable Volume, Section/Subsection, and Appendix |
|-----------------|--|--|
| 13 | DFIRM Production (Non-Revised Areas) | Volume 1, Section 1.4 (specifically Subsections 1.4.2.2, 1.4.2.3, and 1.4.3.2) Appendices K, L, and M |
| 13A | Independent QA/QC Review of DFIRM Production (Non-Revised Areas) | Volume 1, Section 1.4 (specifically Subsections 1.4.2.2, 1.4.2.3, and 1.4.3.2) Appendices K, L, and M |
| 14 | DFIRM Production (Merging Revised and Non-Revised Areas) | Volume 1, Section 1.4 (specifically Subsections 1.4.2.3 and 1.4.3.3) Appendices K, L, and M |

Section 6—Schedule

The activities documented in this MAS shall be completed in accordance with the project schedule shown in Table 6-1. If changes to this schedule are required, the responsible Mapping Partner shall coordinate with FEMA and the other Mapping Partners in a timely manner.

Table 6-1. Project Schedule

| ACTIVITIES | RESPONSIBLE PARTNER(S) | START DATE (MM/DD/YY) | DUE DATE (MM/DD/YY) |
|---|-------------------------------|------------------------------|----------------------------|
| Activity 3 – Field Surveys and Reconnaissance | CTP Contractor | 10/01/04 | 04/08/05 |
| Activity 6 –Hydrologic Analyses | CTP Contractor | 01/01/05 | 04/08/05 |
| Activity 7–Independent QA/QC Review of Hydrologic Analyses | FEMA NSP | | |
| Activity 8 – Hydraulic Analyses | CTP Contractor | 04/01/05 | 06/01/05 |
| Activity 9 – Independent QA/QC Review of Hydraulic Analyses | FEMA NSP | | |
| Activity 10 – Floodplain Mapping (Detailed Riverine Analysis) | CTP Contractor | 06/01/05 | 08/31/05 |
| Activity 10A – Floodplain Mapping (Redelineation Using Effective Flood Profiles and Updated Topographic Data) | CTP Contractor | 01/01/05 | 09/30/05 |
| Activity 11 – Independent QA/QC Review of Floodplain Mapping (Revised Areas) | FEMA NSP | | |
| Activity 13 – DFIRM Production (Non-Revised Areas) | CTP Contractor | 01/01/05 | 09/30/05 |
| Activity 13A – Independent QA/QC Review of DFIRM Production (Non-Revised Areas) | FEMA NSP | | |
| Activity 14 – DFIRM Production (Merging Revised and Non-Revised Information) | CTP Contractor | 07/01/05 | 09/30/05 |
| Activity 17 - Outreach | City of Jonesboro | 09/01/04 | 09/30/06 |

Section 7—Certifications

The following certifications apply to this MAS:

Activity 3 (Field Surveys and Reconnaissance) and Activity 4 (Topographic Data Development)

A Registered Professional Engineer or Licensed Land Surveyor shall certify topographic data, in accordance with 44 CFR 65.5(c). Certification of topographic data by the American Society for Photogrammetry and Remote Sensing is also acceptable.

Activity 6 (Hydrologic Analyses), Activity 8 (Hydraulic Analyses), Activity 10 (Floodplain Mapping– Detailed Riverine Analysis)

- A Registered Professional Engineer shall certify hydrologic and hydraulic analyses and data in accordance with 44 CFR 65.6(f).
- A Registered Professional Engineer or Licensed Land Surveyor shall certify topographic information in accordance with 44 CFR 65.5(c).

- Any levee systems to be accredited will be certified in accordance with 44 CFR 65.10(e).

Activity 10 (Floodplain Mapping– Detailed Riverine or Coastal Analysis), Activity 10A (Floodplain Mapping {Redelineation Using Effective Flood Profiles and Updated Topographic Data}), Activity 11 (Independent QA/QC Review of Floodplain Mapping {Revised Areas}), Activity 13 (DFIRM Production {Non-Revised Areas}), and Activity 14 (DFIRM Production {Merging Revised and Non-Revised Information})

The DFIRM metadata files shall include a description of the horizontal and vertical accuracy of the DFIRM base map and floodplain information.

Certifications must be made at the time the intermediate data is submitted. For example, if hydrologic data is submitted, certification will be required at the time it is submitted.

Section 8—Technical Assistance and Resources

Project Team members may obtain copies of FEMA-issued LOMCs, archived engineering backup data, and data collected as part of the FEMA Mapping Needs Assessment Process from the NSP, who may be contacted by telephone at 703-960-8800 or by facsimile at 703-329-3023.

General technical and programmatic information, such as FEMA 265 and the Quick-2 computer program, can be downloaded from the FEMA Web site (<http://www.fema.gov/fhm/>). Specific technical and programmatic support may be provided through the NSP: such assistance should be requested through the FEMA Project Officer specified in Section 11 of this MAS.

Project Team members also may consult with the FEMA Regional Project Officer to request support in the areas of selection of data sources, digital data accuracy standards, assessment of vertical data accuracy, data collection methods or subcontractors, and GIS-based engineering and modeling training.

Section 9—Contractors

City of Jonesboro, Arkansas, intends to use the services of Carter & Burgess, Inc. as a contractor for the Flood Map Project documented in this MAS. City of Jonesboro, Arkansas, shall ensure that the procurement for all contractors used for this Flood Map Project complies with the requirements of 44 CFR 13.36

Part 13 may be downloaded in PDF or text format from the U.S. Government Printing Office Web site at http://www.access.gpo.gov/nara/cfr/waisidx_02/44cfr13_02.html.

Section 10—Reporting

Because funding has been provided to City of Jonesboro, Arkansas, by FEMA for the Flood Map Project documented in this MAS, financial reporting requirements for City of Jonesboro, Arkansas, will be in accordance with Cooperative Agreement Articles V and VI.

City of Jonesboro, Arkansas will meet with the NSP and/or FEMA quarterly to review the progress of the project. These meetings will alternate between FEMA's Regional Office and the City of Jonesboro's office.

City of Jonesboro, Arkansas, or its contractor(s) will provide monthly reports to FEMA and the NSP by the 2nd business day of the month for this MAS. A monthly template will be used to document the study progress along with updating the Monitoring Information on Contracted Studies (MICS) system.

Section 11—Points of Contact

The points of contact for this Flood Map Project are Gary Zimmerer, the FEMA Regional Project Officer; and Claude Martin, the Project Manager for the City of Jonesboro, Arkansas; or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. When necessary, the assistance of the NSP should be requested through the FEMA Project Officer, Gary Zimmerer. The NSP point of contact for this project is Michael Anderson, PE, CFM of Michael Baker Corporation.

In addition, the NSP is required to coordinate project issues with the party that actually created the MAS deliverable or portions of the MAS deliverable product and will document all such coordination activities with the CTP and FEMA.

Section 12—Project Coordination

Throughout the project, all members of the Project Team will coordinate, as necessary, to ensure the products meet the technical and format specifications required and contain accurate, up-to-date information. Coordination activities shall include:

- Meetings, teleconferences, and videoconferences with FEMA and other Project Team members quarterly;
- Telephone conversations with FEMA and other Project Team members on a scheduled monthly basis and an ad hoc basis, as required;
- Updates to the MICS, Mapping Needs Update Support System database, and other FEMA status information systems in accordance with requirements in Volumes 1 and 3 of *Guidelines and Specifications for Flood Hazard Mapping Partners*; and
- E-mail, facsimile transmissions, and letters, as required.

SECTION 13 — Funding / Leverage

INTRODUCTION

This document has been assembled to provide leverage information that has been supplied by Carter & Burgess, Inc. for the City of Jonesboro for the Craighead County FEMA Flood Insurance ReStudy effort. The following information has been provided in both electronic and paper format to the FEMA NSP. The following sections include summary information documenting all contributions made by the community.

FIELD SURVEYS

Provide a summary of all field surveys that were completed for the streams analyzed in hydraulic studies. Include the stream names, number of cross-sections per stream, and number & type of structures surveyed per stream. If available, provide photographs and survey field notes (paper and/or digital) that were obtained during the study. Carter Burgess &/or the City of Jonesboro will provide FEMA with a copy of the survey data.

| Stream Name | Stream Miles | Cross-sections (“valley”) | Bridges and culverts |
|-------------------------------------|--------------|---------------------------|----------------------|
| Turtle Creek | 3.41 | 14 | 11 |
| Turtle Creek Lateral | 1.52 | 6 | 3 |
| Lateral No. 5 | 2.46 | 9 | 7 |
| Whiteman’s Creek | 3.60 | 12 | 11 |
| Higginbottom Creek | 3.98 | 16 | 12 |
| Unnamed Tributaries to Viney Slough | 3.41 | 18 | 10 |
| TOTALS | 18.37 | 75 | 54 |

TOPOGRAPHIC MAPPING

Provide an exhibit that includes all of the topographic mapping area completed by the community. Also provide a detailed explanation regarding the type of information that is available and the accuracy of the information. Attach example metadata file if available. Landair Mapping performed a contract for 2’ contour development using LiDAR for the City of Jonesboro in 2003-2004. The area covered by the 2’ contours encompasses most of the City of Jonesboro’s corporate limits at this time.

BASE MAP DEVELOPMENT

Provide an exhibit that includes all of the base mapping completed by the community. The community can provide one of the two acceptable base maps that can be used in the study which are ortho-rectified images and vector based street coverages. In addition to the street layout, the community should provide the corporate boundaries, parcels, stream centerlines, etc. Please provide a summary of all data that has been provided by the community to assist in the study effort. Attach an example metadata file if available. The City of Jonesboro acquired aerial photography in 2000. The City of Jonesboro also has AutoCAD drawings with the corporate boundaries, streets, citywide GPS monument data, and some other data mentioned above.

RIVERINE HYDROLOGY

Provide a summary of the basins studied with a rainfall-runoff model, regional regression equations, and frequency analyses. Include the program and version or regression equation source as applicable. An exhibit of the basins that were studied should be included if available. The streams studied also had new hydrology developed for them using HEC-1. The rainfall depth duration frequency data were obtained from TP-40 and HYDRO-35. Existing conditions hydrology as well as ultimate conditions hydrology based upon zoning map as of May 30, 2002 (AutoCAD drawing) were created for the study area.

RIVERINE HYDRAULICS

Provide a summary table of the streams studied with detailed and approximate methods. Include the program and version used if applicable. The City of Jonesboro had experienced flooding in areas with storms that were less than the "100-year storm". This prompted detailed hydraulic study of the streams table below.

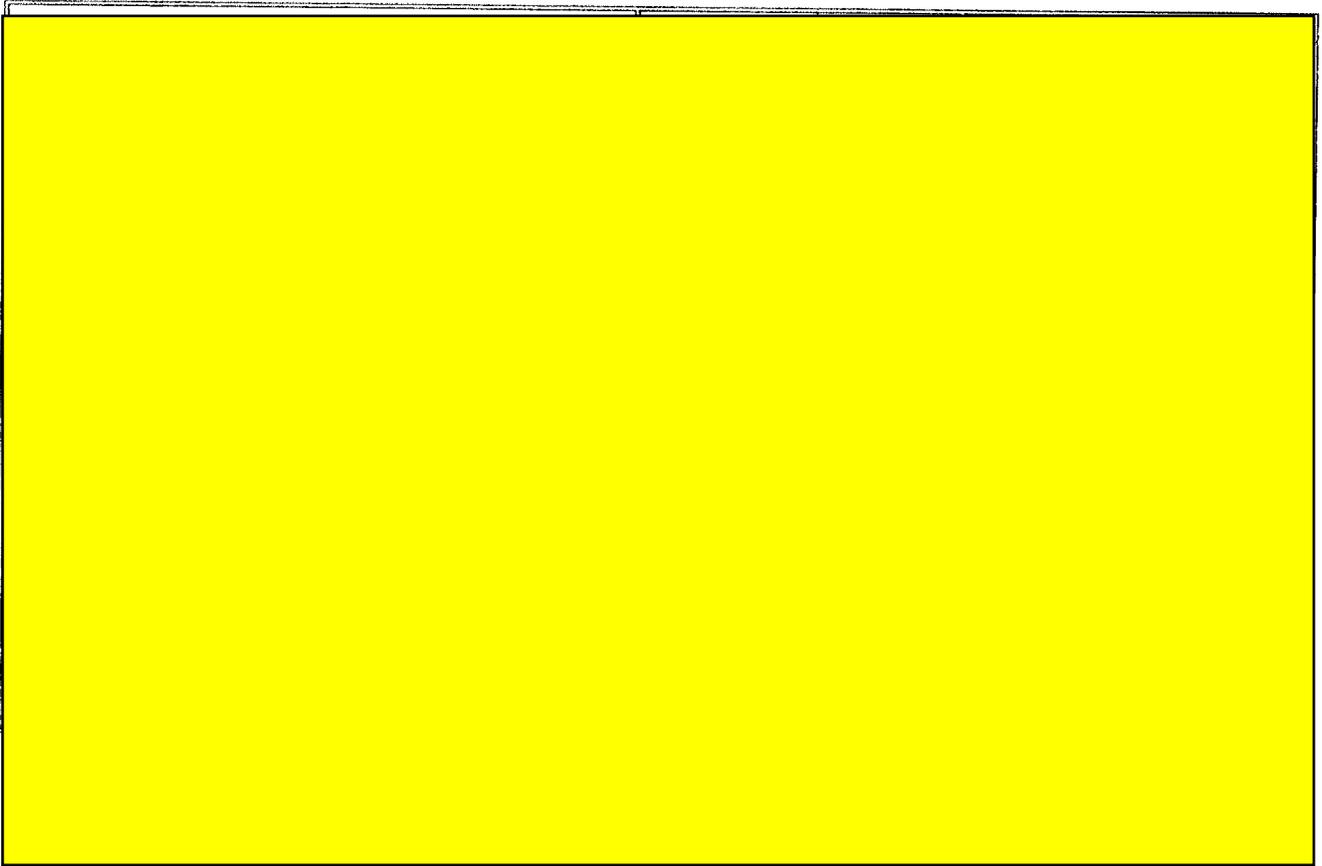
| Stream Name | Stream Miles | Detailed Analysis | Program used and version |
|-------------------------------------|--------------|-------------------|--------------------------------------|
| Turtle Creek | 3.41 | YES | HEC-GeoRAS and HEC-RAS version 3.1.1 |
| Turtle Creek Lateral | 1.52 | YES | HEC-GeoRAS and HEC-RAS version 3.1.1 |
| Lateral No. 5 | 2.46 | YES | HEC-GeoRAS and HEC-RAS version 3.1.1 |
| Whiteman's Creek | 3.60 | YES | HEC-GeoRAS and HEC-RAS version 3.1.1 |
| Higginbottom Creek | 3.98 | YES | HEC-GeoRAS and HEC-RAS version 3.1.1 |
| Unnamed Tributaries to Viney Slough | 3.41 | YES | HEC-GeoRAS and HEC-RAS version 3.1.1 |

FLOODPLAIN DELINEATION

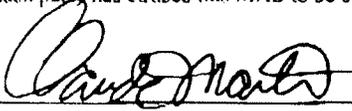
Provide a summary of the streams where the floodplain has been delineated on workmaps. Please include a summary of the level of delineation that occurred. This may include the 1-percent chance floodplain, 0.2-percent chance floodplain, and the regulatory floodway. Presently the City of Jonesboro has studies underway for Turtle Creek, Turtle Creek Lateral, Lateral No. 5, Whiteman's Creek, Higginbottom Creek, and Unnamed Tributaries to Viney Slough. The study includes 1-percent chance floodplain and 0.2-percent chance floodplain. The current study does *not* include a regulatory floodway or profiles.

SUMMARY OF LEVERAGE DOLLARS

Blue Book estimates of the City of Jonesboro resources.



Each party has caused this MAS to be executed by its duly authorized representative.



Claude Martin
Date 9/08/04
Project Manager
City of Jonesboro, Arkansas



Gary Zimmerer
Date 9/10/04
Regional Project Officer
Federal Emergency Management Agency, Region VI