



March 17, 2014

Mr. Clair Davis, P.E., CFM  
Floodplain Administrator  
TPW Stormwater Management  
City of Fort Worth  
1000 Throckmorton  
Fort Worth, Texas 76102

**Re: Proposal for City of Fort Worth Mapping Activity Statement (MAS) # 1 for FEMA Cooperating Technical Partner (CTP) FY13 Project**

Dear Mr. Davis:

Please find the attached fee proposal to assist the City of Fort Worth with the Mapping Activity Statement (MAS) tasks for submittal to FEMA as part of the FY13 Cooperating Technical Partner (CTP) Risk MAP Project.

Attached are the following documents:

- Attachment A – Proposed Scope of Work
- Attachment B – Proposed Fee Estimate
- Attachment C – Changes and Amendments to Standard Agreement
- Attachment D – Proposed Project Schedule
- Attachment E – City of Fort Worth FEMA MAS No. 1

This professional services contract requires a qualified team with FEMA project experience in order to efficiently meet the FEMA technical requirements and schedule. Halff provides a team with significant FEMA experience including over ten MAS assignments from other Texas CTPs in the past 5 years. Halff assisted the City of Fort Worth with the preparation of the grant application for this project where \$154,197 will be funded by the CTP grant and \$5,000 funded by the City of Fort Worth.

We appreciate your consideration of our team for this assignment. Please do not hesitate to contact me if you have any questions or require additional information.

Sincerely,

**HALFF ASSOCIATES, INC.**

A handwritten signature in blue ink that reads "Jessica D. Baker".

Jessica Baker, P.E., CFM, PMP  
Attachments  
cc: T. Lynn Lovell, P.E., CFM

**ATTACHMENT A**  
**Proposed Scope of Work**

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**City of Fort Worth**  
**Mapping Activity Statement (MAS) # 1**  
**FEMA Cooperating Technical Partner (CTP) FY13 Risk MAP Project Execution**

**March 17, 2014**

**PURPOSE**

The City of Fort Worth has been and continues to be proactive in developing and maintaining detailed floodplain information for multiple watersheds throughout the City. The purpose of this proposed Scope of Work is to assist the City of Fort Worth with the tasks detailed in MAS No.1 for submittal to FEMA.

The scope set forth herein defines the work to be performed by the ENGINEER in completing the project. Both the CITY and ENGINEER have attempted to clearly define the work to be performed and address the needs of the Project. Under this scope, “ENGINEER” is expanded to include any sub-consultant, employed or contracted by the ENGINEER.

**PROJECT ACTIVITIES**

The FEMA study effort includes the following tasks. Details for each task are included in Attachment E - City of Fort Worth Mapping Activity Statement No. 1.

- Task 1: Outreach
- Task 2: Perform Field Surveys – portion of task to be completed by MBE/SBE firm, Garcia Land Data, Inc.
- Task 3: Develop Hydrologic Data (including independent QA/QC)
- Task 4: Develop Hydraulic Data (including independent QA/QC)
- Task 5: Perform Floodplain Mapping (including independent QA/QC)
- Task 6: Develop DFIRM Database
- Task 7: Develop Non-Regulatory Products

**ATTACHMENT B**  
**Proposed Fee Estimate**

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City of Fort Worth  
Mapping Activity Statement (MAS) # 1  
FEMA Cooperating Technical Partner (CTP) FY13 Risk MAP Project Execution

March 17, 2014

**I. Compensation**

A. The ENGINEER shall be compensated for personnel time, non-labor expenses, and subcontract expenses in performing services enumerated in Attachment A as follows:

- i. **Personnel Time.** Personnel time shall be compensated based upon hours worked directly in performing the PROJECT multiplied by the appropriate Labor Category Rate for the ENGINEER's team member performing the work.

Labor Category Rate as presented in the rate schedule table below is the rate for each labor category performing the work and includes all direct salaries, overhead, and profit.

<b>Labor Category</b>	<b>Rates (\$/hour)</b>
Principal in Charge	\$260.00
Project Manager	\$160.00
Senior QA/QC Engineer	\$180.00
Senior Professional Engineer	\$140.00
Junior Professional Engineer	\$105.00
Engineer-in-Training (EIT)	\$95.00
Survey, RPLS	\$125.00
Survey, 2 Man Crew	\$118.00
Survey, SIT	\$75.00
Senior GIS	\$110.00
Junior GIS	\$75.00
Clerical	\$60.00

- ii. **Non-Labor Expenses.** Non-labor expenses shall be reimbursed as Direct Expenses at invoice or internal office cost.

Direct Expenses (non-labor) include, but are not limited to, mileage, travel and lodging expenses, mail, supplies, printing and reproduction services, other direct expenses associated with delivery of the work; plus applicable sales, use, value added, business transfer, gross receipts, or other similar taxes.

- iii. **Subcontract Expenses.** Subcontract expenses and outside services shall be reimbursed at cost to ENGINEER plus a markup of ten percent (10%).

- iv. **Budgets.** ENGINEER will make reasonable efforts to complete the work within the budget and will keep the City informed of progress toward that end so that the budget or work effort can be adjusted if found necessary.

ENGINEER is not obligated to incur costs beyond the indicated budgets, as may be adjusted, nor is the City obligated to pay ENGINEER beyond these limits.

If ENGINEER projects, in the course of providing the necessary services, that the PROJECT cost presented in Article 2 of this Agreement will be exceeded, whether by change in scope of

**ATTACHMENT B**  
**Proposed Fee Estimate**

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the project, increased costs or other conditions, the ENGINEER shall immediately report such fact to the City and, if so instructed by the City, shall suspend all work hereunder.

When any budget has been increased, ENGINEER's excess costs expended prior to such increase will be allowable to the same extent as if such costs had been incurred after the approved increase.

B. The ENGINEER shall be paid monthly payments as described in Section II - Method of Payment.

**II. Method of Payment**

A. The ENGINEER shall be paid by the City based upon an invoice created on the basis of statements prepared from the books and records of account of the ENGINEER, based on the actual hours and costs expended by the ENGINEER in performing the work.

B. Each invoice shall be verified as to its accuracy and compliance with the terms of this Agreement by an officer of the ENGINEER.

C. ENGINEER shall prepare and submit invoices monthly.

D. Payment of invoices will be subject to certification by the City that such work has been performed.

**III. Summary of Total Project Fees**

A. The tables below are a summary of the proposed project totals.

<b>Firm</b>	<b>Primary Responsibility</b>	<b>Fee Amount</b>	<b>%</b>
<b>Prime Consultant</b>			
Half Associates, Inc.	Execution of FEMA MAS Tasks	\$138,147	86.8%
<b>M/WBE Consultants</b>			
Garcia Land Data, Inc.	FEMA Surveys	\$21,000	13.2%
<b>Non-M/WBE Consultants</b>			
None			
<b>TOTAL</b>		<b>\$159,147</b>	<b>100%</b>

<b>Project Number &amp; Name</b>	<b>Total Fee</b>	<b>M/WBE Fee</b>	<b>M/WBE %</b>
Mapping Activity Statement (MAS) # 1 FEMA Cooperating Technical Partner (CTP) Risk MAP Project Execution	\$ 159,147	\$ 21,000	13.2%

City M/WBE Goal = 13%

Consultant Committed Goal = 13.2%

**ATTACHMENT B**  
**Proposed Fee Estimate**

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B. The table below is a summary of the proposed fees per project activity.

<b>Project Task</b>	<b>Total Fee per Task</b>
Outreach	\$5,000
Perform Field Surveys – \$21,000 to be completed by Garcia Land Data, Inc.	\$51,000
Develop Hydrologic Data and Perform Independent QA/QC	\$15,000
Develop Hydraulic Data and Perform Independent QA/QC	\$32,000
Perform Floodplain Mapping: Detailed Riverine and Perform Independent QA/QC	\$31,000
Develop DFIRM Database	\$4,500
Develop Non-Regulatory Products	\$20,647
<b>Total</b>	<b>\$159,147</b>

**ATTACHMENT "C"**

**CHANGES AND AMENDMENTS TO STANDARD AGREEMENT**

Design Services for  
City of Fort Worth Mapping Activity Statement (MAS) #1 Risk MAP Project  
City Project No. \_\_\_\_\_

No revisions to the Standard Agreement.

**ATTACHMENT D**  
**Proposed Project Schedule**

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City of Fort Worth  
Mapping Activity Statement (MAS) # 1  
FEMA Cooperating Technical Partner (CTP) FY13 Risk MAP Project Execution

March 17, 2014

All tasks shall be completed following the scheduled outlined in Exhibit E - Mapping Activity Statement No. 1.

The estimated project schedule is as follows:

ACTIVITIES	Estimated START DATE	Estimated END DATE
NOTICE TO PROCEED	3/24/2014	
Outreach	8/1/2014	10/31/2014
Perform Field Surveys	3/24/2014	4/30/2014
Develop Hydrologic Data and Perform Independent QA/QC	3/24/2014	7/31/2014
Develop Hydraulic Data and Perform Independent QA/QC	3/24/2014	7/31/2014
Perform Floodplain Mapping: Detailed Riverine and Perform Independent QA/QC	3/24/2014	7/31/2014
Develop DFIRM Database	3/24/2014	7/31/2014
Develop Non-Regulatory Products	8/1/2014	10/31/2014

# ATTACHMENT E



# FEMA

## CITY OF FORT WORTH COOPERATING TECHNICAL PARTNERS RISK MAP FLOOD STUDY MAPPING ACTIVITY STATEMENT Production

### Mapping Activity Statement No. 1

In accordance with the Cooperating Technical Partners (CTP) Partnership Agreement dated November 19, 2012 between the City of Fort Worth, and the Federal Emergency Management Agency (FEMA), this Mapping Activity Statement (MAS) No. 1 includes the following project areas and production phases:

- Lower West Fork Trinity River HUC-8 – Phase Two (Risk Identification & Assessment)
  - Detailed Studies within the City of Fort Worth – 24.1 stream miles

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## **SECTION 1—OBJECTIVE AND SCOPE**

The objective of the Risk MAP Project documented in this CTP Production Mapping Activity Statement (CTP-Production-MAS) is to document the project efforts to include a project specific scope of services and deliverables for the mapping projects identified below:

- Lower West Fork Trinity River HUC-8 – Phase Two (Risk Identification & Assessment)
  - Detailed Studies within the City of Fort Worth – 24.1 stream miles

Figure 1 shows the Study Streams for this Risk MAP Project. Please note, the updated of the regulatory products (DFIRM panels and FIS Report) is not included with this MAS.

The City of Fort Worth participated in Phase One - Discovery as part of the North Central Texas Council of Government (NCTCOG) efforts in the Lower West Fork Trinity HUC-8 Watershed during FY12. The City of Fort Worth submitted flood risk mapping needs and mitigation actions identified/completed and considers Phase One - Discovery complete.

All processes, service and deliverables prepared under this MAS must meet the requirements as defined by Federal Emergency Management Agency's (FEMA's) Draft *Risk MAP Operational Standards* (which is a compilation of the standards found in the previously issued volumes and appendices of the *Guidelines and Specifications for Flood Hazard Mapping Partners* as well as *Procedure Memorandums*) and any updates or revisions thereto.

The Standards and other guidelines may be accessed from the FEMA Flood Hazard Mapping website at <http://www.fema.gov/ctp-main/guidelines-specifications-flood-hazard-mapping-partners>. The Geospatial Data Coordination Policy and the Geospatial Data Coordination Implementation Guide are located at <https://hazards.fema.gov> under "Tools & Links." Mapping Partners must also coordinate with FEMA Region 6 to assure that Regional Risk MAP Implementation Guidance is also followed.

Should scope or schedule require a modification, the CTPs should work through the change process by submitting Special Problem Reports (SPR) to the appropriate Regional office.

Once released the Risk MAP Operational Standards will be available through the Knowledge Sharing Site at: <http://pm.riskmapcds.com/kss/default.aspx>

Region 6 Risk MAP Implementation Guidance, Tools and Templates are available at: [http://pm.riskmapcds.com/FEMA\\_REGIONS/REGIONVI/pages/Resources.aspx](http://pm.riskmapcds.com/FEMA_REGIONS/REGIONVI/pages/Resources.aspx)

Projects should be phased in alignment with the Outreach Framework, available at: ([http://pm.riskmapcds.com/FEMA\\_REGIONS/REGIONVI/Outreach%20Strategy/1/Framework.xlsx](http://pm.riskmapcds.com/FEMA_REGIONS/REGIONVI/Outreach%20Strategy/1/Framework.xlsx))

Historic Procedure Memos are available at: <http://www.fema.gov/ctp-main/guidelines-specifications-flood-hazard-mapping-partners>

Operating Guidance (OGs) documents are available to assist CTPs and FEMA in Risk MAP implementation and are not mandatory. Operational Guidance is available at: <http://www.fema.gov/guidance-cooperating-technical-partners-program/operating-guidance-documents>

As the Draft Standards are finalized and expanded, it is expected that the CTP will remain in contact with the FEMA POC to discuss the implementation of that updated or future standards on the existing project. The CTP should provide an overview of the standards effect on current on-going projects. Effective dates and retroactive issuance memos will be reviewed jointly by FEMA and the CTP lead to determine the need for a possible Change Request to modify scope, schedule and budget.

**Phasing Risk MAP Project Production.** In order to allow the flexibility required to move projects from initiation (Discovery) to effective issuance, the Region has identified the following phases for project funding:

- Phase One - Discovery
  - To include Flood Risk Report, Flood Risk Map and Flood Risk Database
  - Discovery and Discovery Close-Out meetings
- Phase Two - Risk Identification and Assessment
  - Engineering and Risk MAP product development
  - Project Kick-off, Flood Risk Review and Resilience meetings
- Phase Three - Regulatory Product Update
  - Preparation of FIS and FIRM
  - Panel Preparation, Preliminary and Effective Panel Issuance
  - Consultation Coordination Officer's (CCO) Meeting

**Deployment.** In order to “deploy” a watershed study area, the following Risk MAP products required:

- Flood Risk Report (based on Average Annualized Loss dataset)
- Flood Risk Map
- Flood Risk Database (based on the Average Annualized Loss dataset)

The following table outlines the required deliverable items for projects to count towards deployment. Please refer to Table 1.1 in planning and preparation of all Risk MAP projects to assure that the project investment will align with the required deliverables indicated by study type below.

**Table 1.1 – Risk MAP Deployment Definitions**

Risk MAP Deployment Definition:		Risk MAP Products			Risk MAP Datasets Required per G&S			Deployment Footprint (without overlaps)
Project Type	Discovery	Flood Risk Map	Flood Risk Report	Flood Risk Database	Changes Since Last FIRM	Flood Depth & Analysis Grids	Flood Risk Assessment	
Riverine	✓	✓	✓	✓	Required when doing a flood engineering regulatory study and when a modernized map is available to compare changes to	Required when doing a flood engineering regulatory study	Refined analysis required for flooding sources where flood depth and analysis grids were produced	Watershed (HUC-8)
Coastal	✓ At the Community level	✓	✓	✓	Required when doing a flood engineering regulatory study and when a modernized map is available to compare changes to	Applicable only where beneficial. Guidance will clarify and differentiated where coastal depth grids add value and will be required.	Refined analysis required for flooding sources where flood depth and analysis grids were produced	Community (CID)
Levee	Apply "Revised Analysis and Mapping Procedures for Non-Accredited Levees"	✓	✓	✓	Required when doing a flood engineering regulatory study and when a modernized map is available to compare changes to	Required when doing a flood engineering regulatory study	Refined analysis required for flooding sources where flood depth and analysis grids were produced	Project Footprint
Conversion	Conversion Memo				Required when doing a flood engineering regulatory study and when a modernized map is available to compare changes to			Project Footprint

In order to maintain the investment and production tracking databases, all projects identified in the attached Mapping Activities Statement should also include a GIS file with the project footprint. Either HUC-8 watershed, county or project FIRM panel areas for use in national roll up and reporting required during each fiscal year. If the footprint of a project is modified, a revised GIS footprint file shall be submitted with the Change Request documentation.

This Risk MAP Project will be completed by the following entities:

- City of Fort Worth
- Contractor(s)

In cooperation, the State CTP Lead and the FEMA Project Monitor will establish a Regional Project Team (RPT). The RPT should be established at the onset of a project and at a minimum should include the FEMA Project Monitor. As a project progresses, it may be deemed that other parties are necessary for the successful delivery of Risk MAP within the project area. The RPT will be led by the CTP and meet periodically throughout a project’s lifecycle. The CTP is responsible for coordinating the activities identified in this MAS No. 1. The FEMA Region should be provided with documentation identifying the PMT membership and meeting schedule.

The Mapping Partner shall notify FEMA and all applicable parties of all meetings with community officials, and other relevant meetings, at least two weeks prior to the meeting (with as much notice as possible). FEMA and/or its contractor may or may not attend the community meetings.

**Quality Program for Mapping Partners.** City of Fort Worth is responsible for the implementation of an independent Quality Assurance/Quality Control (QA/QC) plan for all assigned activities. The City of Fort Worth will submit a Summary Report that describes and provides the results of all automated or manual QA/QC review steps. The plan should include the process for all assigned activities.

It is expected that each CTP within the Region have in place a Quality Assurance/Quality Control (QA/QC) plan. Independent QC review activities may be included in the costs associated with the delivery of CTP data for tasks identified within the MAS. The City of Fort Worth will need to submit its QC plan to the Regional Project Officer for approval.

Please note FEMA routinely performs periodic audits and overall study/project management reviews to ensure study quality standards are being maintained. The City of Fort Worth will be responsible for addressing any and all comments resulting from independent QA reviews, including re-submittal of deliverables and products, to include these items passing all technical reviews. The City of Fort Worth will submit Risk MAP products to FEMA's designated reviewer for QC prior to public issuance.

FEMA's Production and Technical Services (PTS) contractor remain responsible for National Quality Control Review requirements in the preliminary and post-preliminary documentation reviews required to assure due process is completed and appropriately documented as outlined in the Document Control Procedure Manual and Procedure Memorandum 42. The City of Fort Worth will be responsible for addressing any and all comments resulting from these National reviews, including re-submittal of deliverables and products, to include these items passing all required reviews.

**Data Availability.** The Mapping Partner shall maintain an archive of all data submitted. All supporting data must be retained for a minimum of three years from the date a funding recipient submits its final expenditure report to FEMA.

**Data Delivery.** FEMA will provide download/upload capability for data submittals through the MIP located at <https://hazards.fema.gov>. As each activity is completed, the data must be submitted to the MIP for validation by the FEMA Project Monitor.

Metadata is required for all activities in accordance with Appendix M, Data Capture Standards, dated May 2013.

**Mapping Information Platform (MIP) Projects:** Two projects will be established for each Risk MAP project area. The Regulatory (REG) project will track the production and delivery Regulatory products (Flood Insurance Study Text and Flood Insurance Rate Maps), while the Risk MAP Products (RMP) will track the project cost and progress of the non-regulatory products and services.

CTPs should note that projects obligated in the MIP only include FEMA dollars. CTPs should update the MIP to inform FEMA of the FEMA dollars spent each month. Leverage costs, fees and data are entered separately at the completion of the tasks, but are not included in the task dollars for project progress reporting.

**Leverage.** The MIP shall also be populated with appropriate leverage information regarding who paid for the data provided and the amount of data used by the Risk MAP Project as the Scoping, Data Development, Preliminary and Post Preliminary Management tasks are being completed. For future review of leverage entries within the MIP, the CTP should document and include documentation outlining leverage funds associated with the projects in the MAS within the Integrated Baseline Form. These funds should be entered in the appropriate MIP Management task.

**Earned Value Data Entry and the Mapping Information Platform (MIP):** The MIP Workflow is designed and used to track the Earned Value of on-going mapping projects. This information is automatically calculated by the MIP, using the Actual cost and schedule of work performed, or “actuals” and comparing them to the expected cost and schedule of work performed, or “baseline”.

Once the FEMA Regional office has funded a project the CTP should prepare and deliver an Integrated Baseline Form and submit the project schedule and task breakdown to the FEMA Region 6 MIP Champion. FEMA will complete the “Obligate Project Funds” task in the MIP and inform the CTP of the project availability for project progress tracking.

This step establishes the baseline for the project in the MIP, using the cost and schedule information for each task as outlined in this document and agreed to at the completion of the scoping process.

The MIP study workflow allows City of Fort Worth to manage the status of these projects at a task level. The cost and schedule information, updated by the City of Fort Worth for each contracted task, is compared to the baseline established for those tasks. This information is rolled up to a project level and monitored by the FEMA Region to assess progress and Earned Value.

Once the baseline has been established in the MIP, the City of Fort Worth shall input the performance and actual cost to date for each contracted task for each project by the 25<sup>th</sup> of each month. This must be completed at a minimum by every thirty days and at the completion of the task. When a task is completed, including all QA/QC activities in this MAS plus the Quality Control Reviews established in PM 42, the City of Fort Worth shall enter 100% complete, enter the actual completion cost, and the actual completion date within the Manage Scoping task, as applicable. The “Manage” tasks will be open and accepting updates for up to 90 days after the completion of the last producer task in each module.

Earned Value data entry involves updating cost, schedule and performance (physical percent complete) in the MIP by the City of Fort Worth. The City of Fort Worth will maintain a Schedule Performance Index (SPI) and Cost Performance Index (CPI) within a tolerable range (0.92 to 1.08) each monthly reporting period.

**Non-Regulatory Projects in the MIP.** The City of Fort Worth shall contact the Regional MIP Champion lead to obtain the guidance document *Risk MAP Products in the MIP* which explains how Non-Regulatory Products shall be submitted through the MIP. The guidance also explains how performance will be tracked for Non-Regulatory Products – Flood Risk Report, Flood Risk Map and Flood Risk Database. These tasks will be updated in the RMP MIP project.

**Contract Documentation Maintenance.** The City of Fort Worth should alert the FEMA Regional Project Monitor should a project require a modification to the scope, schedule or budget. The CTP shall coordinate an update to the required contract and grant paperwork by submitting a completed Change Request form to the Regional Point of Contact.

Change Request Form can be found online at:

[http://pm.riskmapcds.com/FEMA\\_REGIONS/REGIONVI/Contracting\\_ProgramMgmt/Forms/AllItems.aspx?RootFolder=%2fFEMA%5fREGIONS%2fREGIONVI%2fContracting%5fProgramMgmt%2f1%2fChange%20Requests&FolderCTID=&View=%7bc5bb33fb%2d51e3%2d460b%2db418%2d50cb3567c892%7d](http://pm.riskmapcds.com/FEMA_REGIONS/REGIONVI/Contracting_ProgramMgmt/Forms/AllItems.aspx?RootFolder=%2fFEMA%5fREGIONS%2fREGIONVI%2fContracting%5fProgramMgmt%2f1%2fChange%20Requests&FolderCTID=&View=%7bc5bb33fb%2d51e3%2d460b%2db418%2d50cb3567c892%7d)

**Other Requirements.** The Project Officer, as needed, may request additional information on status on an ad hoc basis.

The following tasks further define the scope and delivery requirements for each phase of production project which are included in the Mapping Activities Statement.

## ***Project Management***

**Responsible Mapping Partner:** City of Fort Worth with Contractor(s)

**Scope:** Project Management is the active process of planning, organizing, and managing resources toward the successful accomplishment of pre-defined project goals and objectives. The City of Fort Worth will coordinate with the FEMA Regional Office with respect to Project Management activities and technical mapping activities.

Project management costs should be determined by phase and included in the Integrated Baseline Form. The project management costs of each phase will be included with an associated MIP task to allow the Mapping Partners to report progress and invoice these project management fees. The project management costs will be rolled up into the following project MIP tasks by phase:

- Phase One - Discovery
  - Project management fees will be included in the MIP *Scoping* task
- Phase Two - Risk Identification and Assessment
  - Project management fees will be included in the MIP *Perform Floodplain Mapping* task
- Phase Three - Regulatory Product Update
  - Project management fees will be included in the MIP *Post Preliminary Processing* task

**Standards:** All Project Management work shall be performed in accordance with the standards specified in Section 5 - Standards.

**Deliverables:**

- Monthly Earned Value data reporting through the MIP with variance explanations to support management of technical mapping activities within specified timeframe, for both Regulatory and Non-Regulatory Products;
- Management of SPI/CPI performance for an organization;
- Overall project QA/QC maintenance information, such as maintaining a QA/QC log and providing a QA/QC approach to FEMA for review and approval; and
- Management of adherence to scope of work and quality of work for an organization.

## ***Project Risk Identification and Mitigation***

Responsible Mapping Partner: City of Fort Worth with Contractor(s)

Threats to the planned completion of a project may come from various sources. Risks should be identified during the planning phase and monitored throughout the project so that potential impact can be assessed and solution strategies developed and implemented as needed.

Risk identification and mitigation is required of all Cooperating Technical Partners, the Region looks to work with its mapping partners throughout the project lifecycle in a proactive manner to identify project risks and determine solutions that are cost-effective and efficient in implementation for all partners.

Project risks should be discussed quarterly with the FEMA Project Monitor.

**Table 1.2 – Project Risk Identification**

Project Risk	Likelihood (High/Medium/Low)	Potential Project Impact	Solution/Mitigation Strategy
Lack of Funding	Low	Study is not completed	Secure funding prior to the start of project

## ***Project Documentation***

Responsible Mapping Partner: City of Fort Worth with Contractor(s)

Scope: All FEMA projects require the documentation of the analysis, processes and engineering judgment utilized during the preparation of a Flood Insurance Study. This information is included in a series of Technical Study Data Notebooks (TSDNs) in Region 6. The requirements of these deliverables are outlined below.

Standards: All Program Documentation shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: The City of Fort Worth shall make the following products available to FEMA by uploading the digital data to the MIP, in accordance with the schedule outlined in Section 6:

- The CTP will deliver intermediate TSDNs as each Data Development Task is completed. TSDNs will be prepared for the following Manage Data Development Tasks:
  - Topographic Data Development (Phase Two)
  - Perform Field Survey (Phase Two)
  - Develop Hydrologic Data (Phase Two)
  - Develop Hydraulic Data (Phase Two)
  - Floodplain Mapping (Phase Two)
  - Risk MAP products (Phase Two)
  - Base Map Acquisition (Phase Three)
  - DFIRM Database (Phase Three)
  - Flood Elevation Determination Document (FEDD) – Phase Three

- CTP will deliver the revised Flood Risk Report, Flood Risk Database and Flood Risk MAP ahead of the Resilience meeting.
  - These items will be delivered to the Region for future reference and use due to current MIP upload limitations.
  - Delivery reports should include two hard copies delivered to the Region
  - Each hardcopy should include DVD(s) with all spatial data and mapping files used throughout the Discovery Effort
  - Delivery should include editable documents for future use
- The CTP will deliver each Intermediate TSDN in accordance with the Data Capture Standards (DCS) outlined in the DRAFT Guidelines and Standards for Flood Risk Analysis and Mapping, Appendix N, dated January 2012
- The CTP will review their deliveries to FEMA for completeness and certify each submittal as being in accordance with the DCS outlined in the DRAFT Guidelines and Standards for Flood Risk Analysis and Mapping, Appendix N, dated January 2012
  - Once Appendix N is issued, the CTP will review and identify delivery items that may not be included in the final delivery as they are delivering in accordance with the DRAFT Guidance, dated January 2012.
- If the study is selected for Independent Verification and Validation (IV&V), the partner will be provided a copy of the IV&V findings. If the findings indicate that items are not in accordance with the DRAFT Guidelines and Standards for Flood Risk Analysis and Mapping, Appendix N, dated January 2012, the partner will be held responsible for the delivery completion of the items identified. The Region will work with the CTP partner to prepare a Corrective Action Plan as required by FEMA-Headquarters.

### ***Perform Project Outreach***

*(NOTE: The performance of outreach takes place throughout the life of the flood study project. A Project Outreach Plan (POP) should be included in the Engagement Plan/Discovery Report.)*

Responsible Mapping Partner: City of Fort Worth with Contractor(s)

Scope: This Risk MAP project will include at least one (1) in-person opportunities to engage communities, build risk awareness, increase capabilities for risk communication, and stimulate mitigation action at the local level. The overarching goal is to create a climate of understanding and ownership of the mapping process at the State and local levels. Well-planned and executed community engagement 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, the Mapping Partner, and other members of the RPT in responding to congressional inquiries. The costs of each of the meetings identified below should be rolled into the project tasks identified, the outreach costs will not be tracked individually within the MIP.

The actual number of meetings will be determined based on the risk and need at the local level and determined as part of developing the project-based communication plan. Provisions may be made for remote access video/audio feeds for those that cannot attend in person. These opportunities consist of:

**Project Initiation Meeting/Coordination Call.** This meeting will serve to introduce the communities to the RPT, project scope and timeline, expectations for communities with risk communication, methods and data to be used mapping efforts, and to answer any local questions about

the project. This can be held as an in-person meeting, webinar, or conference call. **The costs associated with these efforts shall be included in the MIP REG project – Scoping task.**

**Flood Risk Review Meeting.** This meeting will serve to provide communities with engineering data and drafts of flood risk (non-regulatory) products, collect feedback, and revise as needed. It will also provide FEMA the opportunity to show how the datasets and outreach tools can help communities become more resilient by understanding risk data, communicating about risk, prioritizing mitigation actions and improving mitigation plans, especially risk assessments and mitigation strategies. **The costs associated with these efforts shall be included in the MIP RMP project (Phase Two) – Alluvial Fan (Outreach) task.**

For all meetings, provisions should be made for remote access video/audio feeds for those RPT members that cannot attend in person.

In addition to these meetings, in order to facilitate information sharing and a continuing dialogue between the RPT and the community, the City of Fort Worth will provide communities with a regular status reports outlining the current project status, key accomplishments to date, identified risks, if any, and next steps including estimated next meeting date and meeting content (template to be provided from FEMA or can be created by Mapping Partner).

These status reports will be provided to FEMA for review before electronic distribution. Project update status reports will be distributed to communities at mid-points between each of the meetings, and between the Final Meeting and effective date (for a total of four), to help introduce and prepare the communities for upcoming discussions.

The City of Fort Worth will work with the Regional FEMA Office during the initiation of this activity to develop the Engagement Plan to support the implementation of the mapping project. The Regional Office will have access to many customizable outreach tools that have been developed for this process to support each touch point that the Regional Project Team has with the community.

Standards: The primary guidance for Risk MAP Meetings is in OG-4-11: *Risk MAP Meetings Guidance*. All communication with local governments will be done in accordance with 44 CFR Part 66.

Deliverables: The City of Fort Worth shall deliver the following to the FEMA Regional Project Officer in accordance with the schedule outlined in Section 6 – Schedule and include within the TSDN:

- Project update status reports for project communities.
- Delivery of all associated products to the Regional POC for upload to the RiskMAP6.com website for the identified project areas
- Documentation of mitigation actions into the Action Tracker

## ***Phase Two - Risk Identification and Assessment***

Responsible Mapping Partner: City of Fort Worth with Contractor(s)

Scope: Phase two begins at the Project Kick-Off meeting and ends with the delivery of the Risk MAP products at the Resilience Meeting with all participating parties. The emphasis of this phase is to deliver the required and identified elements (products, services and technical assistance) within the selected project areas to further the Awareness and Action metrics. In the Discovery Report the delivery of Risk MAP throughout the Risk Identification and Assessment phase, has been identified by services and deliverables from three possible project tracks.

**Track 1 – Risk Awareness & Mitigation Actions Track**

**Track 2 – Data & Engineering**

**Track 3 – Risk MAP Products**

The objectives and elements included in the Internal Guidance for Risk MAP Conversion, dated October 19, 2010, shall be referenced and followed as directed by the FEMA Project Monitor. Furthermore, for in-depth guidance, see the Regional Outreach Strategy for the delivery of the phase and tracks. The following tasks may be included in the project work for Phase Two.

Note: Engineering analysis prepared during phase two may be included in a Phase Three effort for the Regulatory Product Update effort in the future. If the engineering analysis prepared is used to update the FIS and FIRM, the party whom produced the analysis is expected to assist FEMA (and its future mapping partner) in responding to appeals and comments received during the 90-day appeal period.

### **Develop Topographic Data**

Responsible Mapping Partner: City of Fort Worth with Contractor(s)

Scope: Topographic/elevation data may be new or existing. New is defined as data that will be flown and processed for the areas specified in this MAS study areas according to the referenced specifications. Existing topographic/elevation data (previously flown and/or processed) may be used to produce flood studies and related products. However, if new data is not to be collected, the FEMA Region should be consulted before leveraging the best available existing topographic to ensure acceptability for the intended level of flood hazard study.

The City of Fort Worth shall obtain additional topographic data for the floodplain areas to be studied including overbank areas. These data will be used for hydrologic analysis, hydraulic analysis, floodplain boundary delineation and/or testing of floodplain boundary standard compliance. City of Fort Worth shall gather availability, currency, and accuracy information for existing topographic data covering the affected communities in this MAS. City of Fort Worth shall use topographic data for work in this MAS only if it is better quality than that of the original study or effective studies. The Mapping Partner will ensure that the FEMA Geospatial Data Coordination Policy and Implementation Guide is followed and the data obtained or to be produced are documented properly as per those policies and guidelines.

Requirements for leveraging existing Topographic Data:

The City of Fort Worth shall use topographic data for the areas described in the Table 1.5 Summary of Topographic Data table. The source of the topographic data must be listed as well. The City of Fort Worth shall coordinate with other team members conducting field surveys as part of this MAS. Accuracy for the topographic data shall be evaluated based on the current FEMA standards for flood hazard study level of detail.

City of Fort Worth also shall update the topographic maps and/or DEMs for the subject flooding sources using the data collected under this Topographic Data Development process and via field surveys. In addition, City of Fort Worth shall address all concerns or questions regarding the topographic data development that are raised by City of Fort Worth during the independent QC review, or during the PM 42 defined Validation Process.

The City of Fort Worth will utilize existing TNRIS topographic data that has been used for other FEMA studies in Tarrant County.

**Table 1.5 – Summary of Topographic Data**

Watershed/ Flooding Source	Beginning and End Points of Topo Data Collection	New/Existing OR Leveraged	Accuracy & Year Acquired	Source/ Data Vendor	Contact Information	Use Restrictions
Lower West Fork Trinity River HUC- 8 Watershed		Existing	1.2 ft vertical 2009	TNRIS	TNRIS	None

Standards: All Topographic Data Development work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: City of Fort Worth shall make the following products available to FEMA by uploading the digital data to the MIP in accordance with the schedule outlined in Section 6 – Schedule:

- Documentation in overall TSDN Report summarizing terrain methodology and results;
- Support documentation and Certification of Work;
- Where paper documentation is required by State Law for Professional certifications, the Mapping Partner may submit the paper in addition to a scanned version of the paper for the digital record. Please coordinate with the Regional and/or State representative to verify state reporting requirements.
- CTP will perform Quality Assurance and Quality Control (QA/QC) review and provide
  - A Summary Report that describes the findings of the independent QA/QC review;
  - Confirmation of update(s) made to the NDEP;
  - Recommendations to resolve any problems that are identified during the independent QA/QC review; and

## Develop Hydrologic Data

Responsible Mapping Partner: City of Fort Worth with Contractor(s)

Scope: City of Fort Worth shall perform hydrologic analyses for approximately 22.4 square miles of drainage area for the flooding source(s) identified in Table 1.6. The City of Fort Worth shall calculate peak flood discharges for the 10-, 4-, 2-, 1- and 0.2- percent-annual-chance events using the HEC\_HMS computer program as defined in Table 1.7. These flood discharges will be the basis for subsequent Hydraulic Analyses performed under this Mapping Activity Statement No. 1.

If GIS-based modeling is used, City of Fort Worth shall document automated data processing and modeling algorithms, and provide the data to FEMA to ensure these are consistent with FEMA standards. Digital datasets (such as elevation, basin, or land use data) are to be documented and provided to FEMA for approval before performing the hydrologic analyses to ensure the datasets meet minimum requirements. If non-commercial (i.e., custom-developed) software is used for the analysis, then City of Fort Worth shall provide full user documentation, technical algorithm documentation, and the software to FEMA for review before performing the hydrologic analyses.

**Table 1.6 – Summary of Hydrologic Analysis**

Study Area Description PMR Study Stream	Current Study Method	Study Method for Revision	Square Miles of New Hydrology
CF-3C (Warner Channel)	Approximate	HEC-HMS	0.6
SC-7A (Upper) Xavier Channel	Approximate	HEC-HMS	0.3
Unnamed Tributary to Sycamore Creek (Marlboro)	Approximate	HEC-HMS	0.9
CF-3A (Upper Willow)	Approximate	HEC-HMS	1.3
Unnamed Tributary to Marys Creek (Royal Creek, trib is between US377 and Old Benbrook Road)	Approximate	HEC-HMS	0.6
MSC-2	Approximate	HEC-HMS	0.7
Edgecliff Branch	Approximate	HEC-HMS	4.5
Stream EB-1 and EB-1A (Edgecliff Tribs)	Approximate	HEC-HMS	0.9
Unnamed Tributary to Kings Branch (Broadmoor)	Approximate	HEC-HMS	0.8
Seybold Creek	Approximate	HEC-HMS	1.0
Menefee Creek (Trib to WF-5)	Approximate	HEC-HMS	0.9
Glenwood Creek (Stream SC-2)	Approximate	HEC-HMS	1.6
Dunbar Creek (Stream WC-1)	Approximate	HEC-HMS	1.5
Wildcat Branch	Approximate	HEC-HMS	1.7
Summer Creek	Approximate	HEC-HMS	1.1

Standards: All Hydrologic Analyses work shall be performed in accordance with the standards specified in Section 5 - Standards.

Deliverables: City of Fort Worth shall make the following products available to FEMA by uploading the digital data to the MIP so that FEMA and its future Mapping Partners can access the data to respond to inquiries. These items should be delivered in accordance with the schedule outlined in Section 6 - Schedule.

- Digital copies of all hydrologic modeling (input and output) files for the 10-, 4-, 2-, 1- and 0.2-percent-annual-chance events;
  - Watersheds should be studied in their entirety
    - Detailed Streams require the 10-, 4-, 2-, 1- and 0.2-percent-annual-chance events to be analyzed
- All required GIS layers meeting specifications outlined for S\_XS and S\_WTR\_LN
  - All required attributes should be included in each of the data sets
  - S\_XS should include station locations for all cross-sections
  - S\_WTR\_LN should include all stream centerlines used for modeling purposes.
  - Additionally, S\_WTR\_LN should include any profile baselines used in production
- Digital versions of all backup data used in the analysis including work maps;
  - For GIS-based modeling, deliverables shall include all input and output data, and GIS data layers;
  - GIS-based modeling approach still requires a work map to be delivered for future use.
- Metadata file;
- Digital versions of draft text for inclusion in the FIS report;
- Digital Summary of Discharges Tables presenting discharge data for the flooding sources for which hydrologic analyses were performed;
- Format Hydrology Database or Data Delivery consistent with the Data Capture Standards (DCS) of all return periods;
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the FIRM as outlined in the approved QA/QC Plan;
- Where paper documentation is required by State Law for Professional certifications, the Mapping Partner may submit the paper in addition to a scanned version of the paper for the digital record. Please coordinate with the Regional and/or State representative to verify state reporting requirements; and
- Summary of the hydrologic analysis for each study area in Table 1.6 Summary of Hydrologic Analysis.
- CTP will perform Quality Assurance and Quality Control (QA/QC) review and provide
  - A Summary Report that describes the findings of the independent QA/QC review;
  - Confirmation of update(s) made to the NDEP;
  - Recommendations to resolve any problems that are identified during the independent QA/QC review; and
- TSDN, as outlined in the Project Documentation section of this Mapping Activities Statement

## Perform Field Survey

Responsible Mapping Partner: City of Fort Worth with Contractor(s)

**Scope:** To supplement any field reconnaissance conducted during the Project Discovery phase of this project, City of Fort Worth 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.

The City of Fort Worth shall conduct field surveys, including obtaining channel and floodplain cross sections, identifying or establishing temporary or permanent bench marks, and obtaining the physical dimensions of hydraulic and flood-control structures. If appropriate, the City of Fort Worth shall also identify items needed for coastal analyses including land cover, vegetation types, housing, dunes, beach nourishment, and coastal structures. The City of Fort Worth also shall coordinate with other entities that are involved in the Topographic Data Development process regarding ongoing activities and deliverables.

**Standards:** All Field Survey work shall be performed in accordance with the standards specified in Section 5 - Standards.

**Deliverables:** The City of Fort Worth shall make the following products available to FEMA by uploading the digital data to the MIP, in accordance with the schedule outlined in Section 6:

- A report summarizing the findings of the field reconnaissance;
- Maps and drawings that provide the detailed survey results;
- Survey notebook containing cross section and structure data;
- Documentation of the horizontal and vertical datum;
- Digital versions of draft text for inclusion in the FIS report;
- Digital survey data consistent with the Data Capture Standards (DCS);
- Metadata file complying with the NFIP Metadata Profiles Specifications;
- Support documentation and Certification of Work;
- TSDN, where appropriate;
- Where paper documentation is required by State Law for Professional certifications, the Mapping Partner may submit the paper in addition to a scanned version of the paper for the digital record. Please coordinate with the Regional and/or State representative to verify state reporting requirements; and
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the FIRM as outlined in the approved QA/QC Plan.

## Develop Hydraulic Data

Responsible Mapping Partner: City of Fort Worth with Contractor(s)

**Scope:** City of Fort Worth shall perform hydraulic analyses as described in Tables 1.7. The modeling will include the 10-, 4-, 2-, 1- and 0.2-percent-annual-chance events based on peak discharges computed under Hydrologic Analyses. The hydraulic methods used for this analysis will include base level and enhanced level hydraulic modeling. The base level will use an automated hydraulic model, and use the best available elevation data. It will not include field surveys, floodways, or mapped BFEs. The enhanced level may include field surveys, floodways, and the 10-, 4-, 2-, 1- and 0.2- percent-annual-chance events, using methods described in Table 1.7.

The Mapping Partner shall use the cross-section and field data collected during Field Survey and the topographic data collected during the Topographic Data Collection, when appropriate, to perform the hydraulic analyses. The hydraulic analyses will be used to establish flood elevations and regulatory floodways for the subject flooding sources.

The City of Fort Worth shall use the FEMA CHECK-2 or CHECK-RAS checking program to verify the reasonableness of the hydraulic analyses. To facilitate the independent QA/QC review, City of Fort Worth shall provide explanations for unresolved messages from the CHECK-2 or CHECK-RAS program, as appropriate. In addition, the City of Fort Worth shall address all concerns or questions regarding the hydraulic analyses that are raised by City of Fort Worth during the independent QA/QC review.

The City of Fort Worth shall document automated data processing and modeling algorithms for GIS-based modeling and provide the data to FEMA for review to ensure these are consistent with the standards outlined above. Digital datasets are to be documented and provided to FEMA for approval before performing the hydraulic analyses to ensure the datasets meet minimum requirements. If non-commercial (i.e., custom-developed) software is used for the analyses, then City of Fort Worth shall provide full user documentation, technical algorithm documentation, and software to FEMA for review before performing the hydraulic analyses.

Any flooding sources associated with a levee that are mapped as providing protection on effective FIRMs, but will not meet certification requirements for the new FIRMs, will require revised hydraulic analysis. The revised analysis should meet all of FEMA's related Program and Working standards. *Historic Reference Materials* – G&S Appendix C, PMs 34, 43, 51, 52, 53, 59, and 63.

**Table 1.7 – NVUE Summary and Summary of Hydraulic Data**

<b>ID</b>	<b>Flooding Source Name</b>	<b>Current Inventory</b> (Modernized, Paper, Not Studied/Included)	<b>Current CNMS Status</b> (Unknown, Unverified, Valid)	<b>Current Study Method</b> (Approximate, Detailed)	<b>Proposed Study Method</b> (Approximate, Limited Detail, Detailed)	<b>Total Mileage</b>
1	CF-3C (Warner Channel)	Modernized	Unknown	Approximate	Detailed	0.6
2	SC-7A (Upper Xavier Channel)	Modernized	Unknown	Approximate	Detailed	0.4
3	Unnamed Tributary to Sycamore Creek (Marlboro)	Modernized	Unknown	Approximate	Detailed	1.3
4	CF-3A (Upper Willow)	Modernized	Unknown	Approximate	Detailed	1.3
5	Unnamed Tributary to Marys Creek (Royal Creek, trib is between US377 and Old Benbrook Road)	Modernized	Unknown	Approximate	Detailed	1.2
6	MSC-2	Modernized	Unknown	Approximate	Detailed	2.4
7	Edgecliff Branch	Modernized	Unknown	Approximate	Detailed	4.4
8	Stream EB-1 and EB-1A (Edgecliff Tribs)	Modernized	Unknown	Approximate	Detailed	1.1
9	Unnamed Tributary to Kings Branch (Broadmoor)	Modernized	Unknown	Approximate	Detailed	0.9
10	Seybold Creek	Modernized	Unknown	Approximate	Detailed	2.2
11	Menefee Creek (Trib to WF-5)	Modernized	Unknown	Approximate	Detailed	1.3
12	Glenwood Creek (Stream SC-2)	Modernized	Unknown	Approximate	Detailed	1.4
13	Dunbar Creek (Stream WC-1)	Modernized	Unknown	Approximate	Detailed	1.6
14	Wildcat Branch	Modernized	Unknown	Approximate	Detailed	2.8
15	Summer Creek	Modernized	Unknown	Approximate	Detailed	1.2

## Base Flood Elevations

It is the requirement of the Region to produce and provide Base Flood Elevations (through all hydraulic methods selected for a project either through Automated Approximate (when possible), Enhanced Approximate, Limited Input, Limited Detail or Detailed Study) for all project areas studied. If the above project listed has not completed Phase One Production – Discovery prior to execution of this task order, the Regional Project Monitor will identify project areas and study mileage at the conclusion of the Discovery Phase and request an updated scope and cost estimate for that project prior to proceeding into Phase Two.

**Table 1.8 – Hydraulic Study Approaches**

Risk MAP Products	Automated Approximate	Enhanced Approximate	Limited Input	Limited Detail	Detail
Flood Insurance Rate Map	A	A	AE	AE	AE
Flood Insurance Study	*	*	*	*	*
Flood Insurance Study Profile - BFE		Provided to Community	*	*	*
Flood Risk Report & Map	*	*	*	*	*
Flood Risk Database	*	*	*	*	*
Changes Since Last FIRM	*	*	*	*	*
Flood Risk Assessment (HAZUS)	AAL	AAL	*(AAL + New)	*(AAL + New)	*(AAL + New)
Single Flood Frequency Depth Grid (1% Annual Chance)		Provided to Community	*	*	*
Multiple Flood Frequency Depth Grids				*	*
Areas of Mitigation Interest (Enhanced)					*
Additional Enhanced Data Set(s)					*
<b>Terrain Data</b>	• 10M/30M DEMs or LIDAR	• 10M DEMs or LIDAR	• LIDAR	• LIDAR	• LIDAR
<b>Associated Engineering Level</b>	• No Field Survey • Auto H&H • X section not adjusted • No structures	• No Field Survey • Auto H&H • X sections adjusted near structures only • Dam Structures entered	• No Field Survey • Auto H&H • X sections adjusted near structures only • 3 <sup>rd</sup> party Structure Data (Bridge/Culvert)	• Limited Field Survey • Auto H&H • All X sections adjusted	• Field Survey • Detailed H&H • All X sections adjusted

**Standards:** All Hydraulic Data work shall be performed in accordance with the standards specified in Section 5 - Standards.

**Deliverables:** City of Fort Worth shall make the following products available to FEMA by uploading the digital data to the MIP so that City of Fort Worth can access it for an independent QA/QC review in accordance with the schedule outlined in Section 6 - Schedule.

- Digital hydraulic modeling (input and output) files;
  - For Detailed Study Streams the 10-, 4-, 2-, 1- and 0.2-percent-annual-chance events will be analyzed
- Digital profiles for all streams studied
  - FEMA RASPLOT program or similar software should be utilized to prepare the digital profiles;
  - For Detailed Study Streams the 10-, 2-, 1- and 0.2-percent-annual-chance events will be included on the profile
  - PDF and editable GIS or CAD files should be delivered

- Digital tables with range of Manning's "n" values;
- Digital Floodway Data Tables for each flooding source that is compatible with the FIRM database; where applicable
- For GIS-based modeling, deliverables include all input and output data, GIS data layers, and final products in the format of the FIRM database structure;
- Depth grids for all studied streams for all frequencies as required;
  - For Detailed Study Streams depth grids for the 10-, 4-, 2-, 1- and 0.2-percent-annual-chance events shall be delivered
- Metadata file;
- Explanations for unresolved messages from the CHECK-2 or CHECK-RAS program, as appropriate;
- Digital versions of all backup data used in the analyses;
- Digital versions of draft text for inclusion in the FIS report;
- Format Hydraulic Database or Data Delivery consistent with the Data Capture Standards (DCS);
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the FIRM as outlined in the approved QA/QC Plan;
- Where paper documentation is required by State Law for Professional certifications, you shall submit the paper in addition to a scanned version of the paper for the digital record. Please coordinate with the Regional and/or State representative to verify reporting requirements for your state;
- Appropriate leverage information includes who paid for the data and the amount of data used by the Risk MAP Project; and
- CTP will perform Quality Assurance and Quality Control (QA/QC) review and provide
  - A Summary Report that describes the findings of the independent QA/QC review;
  - Confirmation of update(s) made to the NDEP;
  - Recommendations to resolve any problems that are identified during the independent QA/QC review; and
- TSDN, as outlined in the Project Documentation section of this Mapping Activities Statement

## **Perform Floodplain Mapping**

Responsible Mapping Partner: City of Fort Worth with Contractor(s)

Scope for Enhanced Riverine or Coastal Analysis: The City of Fort Worth shall delineate the 1- and 0.2-percent-annual-chance floodplain boundaries and the regulatory floodway boundaries (if required) and any other applicable elements for the flooding sources for which hydrologic, enhanced hydraulic, and/or coastal analyses were performed. The City of Fort Worth shall incorporate all new or revised hydrologic, hydraulic, and/or coastal modeling and shall use the topographic data acquired under Develop Topographic Data to delineate the floodplain and regulatory floodway boundaries on a digital work map.

The City of Fort Worth shall incorporate the results of all effective Letters of Map Change (LOMCs) for all affected communities on the FIRM and provide to the appropriate PTS the required submittals for incorporation into the National Flood Hazard Layer (NFHL). Also, the City of Fort Worth shall address all concerns or questions regarding Floodplain Mapping that are raised by the City of Fort Worth during the independent QA/QC review.

The City of Fort Worth shall capture flood hazard engineering and/or mapping data quality issues encountered during this activity in the CNMS data model for the area of interest. These issues will be entered as “Requests” or “Needs” in the CNMS data model based on the nature of the deficiency encountered. Detailed information on performing this task can be found in the relevant standards specified in Section 5 - Standards.

Standards: All floodplain mapping work shall be performed in accordance with the standards specified in Section 5 – Standards. The Mapping Partner will perform self-certification audits for the Floodplain Boundary Standards for all flood hazard areas and submit this FBS certification with the Perform Floodplain Mapping TSDN.

The City of Fort Worth will complete all required activities related to levees in accordance with the Program and Working Standards.

Deliverables: Upon completion of floodplain mapping for all flooding sources in this project, the City of Fort Worth shall make the following products available to FEMA by uploading the digital data to the MIP so that the City of Fort Worth can access it for the independent QA/QC review in accordance with the schedule outlined in Section 6 – Schedule.

- A metadata file complying with the NFIP Metadata Profiles Specifications, must accompany the compliant digital data;
- Support documentation and Certification of Work,
- Seamless digital floodplain layer meeting specifications for S\_XS, S\_FLD\_HAZ\_AR and S\_FLD\_HAZ\_LN
  - All required attributes should be included in each of the data sets
  - S\_XS should include water surface elevations
- Digital work map showing the 1- and 0.2-percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, flood insurance risk zone designation labels, gutters, PFD, coastal high hazard areas, LiMWA and all applicable base map features;
- Floodplain Boundary Standards (FBS) Certification Report and Back Up Data to support FBS findings. (Historic Procedure Memorandum No. 38 – *Implementation of Floodplain Boundary Standards*)
- Identification of the Letters of Map Change a CTP has reviewed and incorporated and superseded by the engineering analysis performed in the Phase Two efforts.
  - Catalog of cases reviewed and entered into the SOMA tool at [www.hazards.fema.gov](http://www.hazards.fema.gov)
  - Documentation of the last date of LOMC incorporation
- Floodplain Overlay Maps for the Flood Risk Review and Resilience Meetings to be held in Phase Two. Floodplain Overlay Maps are prepared to review the current effective floodplain and the newly prepared engineering results.
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the FIRM as outlined in the approved QA/QC Plan;
- An explanation for the use of existing topography for the studied reaches, if appropriate;
- Written summary of the analysis methodologies;
- Digital versions of draft FIS report, Floodway Data Tables and updated profiles including all profiles and tables converted appropriate datum, as well as any other necessary items for the finalization of the preliminary FIS;
- If automated GIS-based models are applied, all input data, output data, intermediate data processing products, and GIS data layers shall be submitted consistent with the DCS; and

- Where paper documentation is required by State Law for Professional certifications, the Mapping Partner may submit the paper in addition to a scanned version of the paper for the digital record. Please coordinate with the Regional and/or State representative to verify state reporting requirements.
- CTP will perform Quality Assurance and Quality Control (QA/QC) review and provide
  - A Summary Report that describes the findings of the independent QA/QC review;
  - Confirmation of update(s) made to the NDEP;
  - Recommendations to resolve any problems that are identified during the independent QA/QC review; and
- TSDN, as outlined in the Project Documentation section of this Mapping Activities Statement

## **Develop Non-Regulatory Products**

Responsible Mapping Partner: City of Fort Worth with Contractor(s)

Scope: Risk assessment data and analyses are defined as processes for analyzing or evaluating the risk associated with a hazard, and using that information to make informed decisions on the appropriate ways to reduce the impacts of the hazard on people and property. As part of the Risk MAP Program, non-regulatory Flood Risk Products shall be developed for study areas.

During Phase Two, the CTP will update the previously created Flood Risk Products (Flood Risk Report, Flood Risk Map and Flood Risk Database) to include the findings of the engineering analysis performed. In accordance with Procedure Memorandum 65 - *Guidance for Additional Enhanced Dataset Definitions and Flood Risk Database Standards*, the Mapping Partner will prepare Flood Risk Assessment with a combination of the new engineering analysis and the larger scale AAL dataset. The tables and risk assessment calculations within the Flood Risk Report (FRR), Flood Risk Map (FRM) and Flood Risk Database (FRD) will be updated to reflect these changes.

Furthermore, the Mapping Partner may produce the following additional Risk MAP datasets during Phase Two as identified below:

- Areas of Mitigation Interest (AOMI);
- Multi-Frequency Depth Grids (Limited Detail and Detailed Study areas)
- Percent Annual Chance Grid
- 30-Year Annual Chance Grid

The Mapping Partner will develop the following Flood Risk Datasets, as identified in Table 1.9. Flood Risk Assessment Datasets shall be incorporated into the standard Flood Risk Products. Please note, Changes Since Last FIRM (CSLF) will be prepared and delivered in Phase Three.

**Table 1.9 – Risk Assessment Product Development Table**

Watershed(s) and/or Project Areas	Flood Risk Products (FRR, FRM, FRD)	Flood Risk Datasets				
		CSLF	Depth & Analysis Grids	Flood Risk Assessment (describe)	AOMI	Other (add description)
CTP Study Streams	X	X	X	--	--	--

Standards: All Risk MAP work shall be performed in accordance with the standards specified in Section 5 - Standards. *Please contact the Regional POC to obtain draft appendices.*

FEMA’s Operating Guidance document OG 6-11 - *User Guidance for Flood Risk Datasets and Products* is available from the following website: [http://www.fema.gov/plan/prevent/fhm/og\\_main.shtm](http://www.fema.gov/plan/prevent/fhm/og_main.shtm). Additionally, the CTPs should consult Procedure Memorandum 65 - *Guidance for Additional Enhanced Dataset Definitions and Flood Risk*.

The Mapping Partner shall contact the MIP Champion to obtain the guidance document *Risk MAP Products in the MIP* (March 4, 2011) which explains how Non-Regulatory Products shall be submitted through the MIP.

Deliverables: The following products, for those communities identified in Table 1.4 will be made available to FEMA and uploaded to the MIP as appropriate:

- Revised and Updated Flood Risk Report, Flood Risk Map, and Flood Risk Database;
- Flood Depth and Analysis Grids as listed in Table 1.9
- Preliminary Changes Since Last Firm (CSLF) for the New Detailed Study Streams as listed in Table 1.9

### ***Phase Three – Regulatory Product Update (Support)***

Responsible Mapping Partner: City of Fort Worth with Contractor(s)

Scope: Phase Three encompasses the update of the Regulatory Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report. This phase is to update the regulatory FIS and FIRM information prepared in phase two.

#### **Support to Post-Preliminary Map Production**

Responsible Mapping Partners: City of Fort Worth with Contractor(s)

Scope: If another Mapping Partner is selected to prepare the Phase Three – Regulatory Products Update, the CTP whom produced the Hydrology, Hydraulics and Floodplain Mapping tasks will support FEMA and its Mapping Partners in response to Appeal and Comments received during the Statutory 90-Day Appeal and Comment period.

This activity consists of responding to appeals and comments received from the communities and residents within the project area. The City of Fort Worth will be responsible for:

- Coordination with the Phase Three Mapping Partner to review the incoming Appeals and Comments associated with the Hydrology, Hydraulics and Floodplain Mapping submittals.
  - The CTP will be responsible for a coordinated review effort with the Phase Three Mapping Partner to prepare suggestions for appeal and comment incorporation.
  - The CTP shall review the draft FIS text sections submitted during the production of the Hydrology, Hydraulics or Floodplain Mapping tasks to identify areas of required update to incorporate the incoming appeal or comment.
  - The CTP shall review the Hydrologic or Hydraulic modeling submitted during the production of the Hydrology, Hydraulics or Floodplain Mapping tasks to identify areas of required update to incorporate the incoming appeal or comment.
  - Conference calls should be held at the close of the appeal period to allow the review of all appeals and comments received.
- The Phase Three Mapping Partner will be responsible for the update of the Hydrology, Hydraulics and/or Floodplain Mapping tasks to resolve the incoming appeal or comment.
  - The Phase Three Mapping Partner should provide copies of the appeal and comments received and provide at least 10 business days for CTP review and comment.
- The CTP should prepare an Addendum/Memorandum to document the suggested amendments to the FIS, and modeling as well as the TSDNs submitted during the production of the Hydrology, Hydraulics or Floodplain Mapping tasks for upload to the MIP.
- CTP should indicate a number of hours, appeals and comments that will be supported for the project areas prepared in Phase Two efforts.

## ***SECTION 2—Technical and Administrative Support Data Submittal***

The Project Team members for this Risk MAP Project that have responsibilities for activities included in this MAS No. 1 shall comply with the data submittal requirements summarized below and in appropriate Procedure Memorandums.

All supporting documentation for the activities in this MAS shall be submitted according to Appendix M, and will include a flood elevation determination docket (FEDD) folder. Where Technical Support Data Notebook (TSDN) format is used, such shall be submitted in accordance with Section 2 – Technical and Administrative Support Data Submittal. Table 2.1 Mapping Activities and Applicable TSDN Sections indicates the sections of the TSDN that apply to each mapping activity. Submittals must be made to the appropriate PTS for a review of required materials. As needed, the CTP will work with the PTS to ensure that all required documents are included in the TSDN and will respond to requests from the PTS for additional information.

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 Change Request (CR) as soon as possible after the issue is identified. The Mapping Partner should coordinate with their FEMA Project Monitor and prepare the Change Requests forms for submittal to FEMA. The SPR is to describe the issue and propose possible resolutions. For additional information on Change Requests, please review Region 6's change request materials on the SharePoint site:

[http://pm.riskmapcds.com/FEMA\\_REGIONS/REGIONVI/pages/Resources.aspx?RootFolder=%2fFEMA%5fREGIONS%2fREGIONVI%2fContracting%5fProgramMgmt%2f1%2fChange%20Requests&FolderCTID=%7b6A68F0D9%2dB338%2d4671%2d9508%2d55880608B908%7d](http://pm.riskmapcds.com/FEMA_REGIONS/REGIONVI/pages/Resources.aspx?RootFolder=%2fFEMA%5fREGIONS%2fREGIONVI%2fContracting%5fProgramMgmt%2f1%2fChange%20Requests&FolderCTID=%7b6A68F0D9%2dB338%2d4671%2d9508%2d55880608B908%7d)

Please refer to Procedure Memorandum 62 – TSDN and FEDD File Protocol for Mapping Projects.

Intermediate TSDNs are expected in Region 6 and should be uploaded to the MIP at the time of data delivery for each mapping task. The TSDNs required are outlined in the *Project Documentation* section of this MAS.

## ***SECTION 3—PERIOD OF PERFORMANCE (for CTPs)***

The mapping activities outlined in this MAS will be completed as specified in the Agreement Articles of the Cooperative Agreement. The Mapping Activities may be terminated at the option of FEMA or City of Fort Worth in accordance with the provisions of the Partnership Agreement dated November 19, 2012. If these mapping activities are terminated, all products produced to date must be returned and updated into the MIP and the remaining funds from uncompleted activities, provided by FEMA for this MAS, will be returned to FEMA.

Note: Grants awarded for CTPs expire three years from issuance date.

## ***SECTION 4—FUNDING/LEVERAGE***

FEMA is providing funding, in the amount of \$154,147, to City of Fort Worth for the completion of this Risk MAP Project. The City of Fort Worth shall provide any additional resources required to complete the assigned activities for this Risk MAP Project. During the discovery process, additional needs may be identified. Activities associated with any additional needs would be performed based on availability of additional funds. The leverage listed below includes in-kind services and blue book values for acquired  
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information (i.e. base map data, hydrologic and hydraulic analyses, etc.). These values should also be reported in the MIP by the appropriate task owner. The current Blue Book (3.0) is dated September 2011 and can be downloaded from FEMA's Information Resource Library at [http://www.fema.gov/plan/prevent/fhm/ctp\\_info.shtm#4](http://www.fema.gov/plan/prevent/fhm/ctp_info.shtm#4). The City of Fort Worth shall complete Table 4.1 Contribution and Leverage.

**Table 4.1 – Contribution and Leverage**

Project Task	FEMA Contribution	Partner Contribution	% Partner Leverage (of total project cost)	Total Project Cost
Outreach	\$5,000	\$0	0%	\$5,000
Perform Field Surveys	\$46,000	\$262,000	85%	\$308,000
Develop Hydrologic Data and Perform Independent QA/QC	\$15,000	\$65,000	81%	\$80,000
Develop Hydraulic Data and Perform Independent QA/QC	\$32,000	\$80,000	71%	\$112,000
Perform Floodplain Mapping: Detailed Riverine and Perform Independent QA/QC	\$31,000	\$10,000	24%	\$41,000
Develop DFIRM Database	\$4,500	\$0	0%	\$4,500
Develop Non-Regulatory Products	\$20,647	\$0	0%	\$20,647
Total	\$154,147	\$417,000	73%	\$571,147

**Include Reference to Integrated Baseline Form - See attached Fort Worth FY13 IBF**

- Prepare the Integrated Baseline Form for the tasks identified within this Mapping Activities Statement, please include:
  - FEMA Contribution
  - Partner Contribution (in Leverage Rows for each project phase)
  - Total Project Cost

Final leverage dollars or units shall be entered as applicable within the Manage Data Development task in the MIP workflow. Leverage data shall be an estimate of available leverage data at the time the MAS is prepared and shall be further defined in the Discovery Report.

## **SECTION 5—STANDARDS**

All work completed under this MAS must meet the requirements as defined by FEMA's *Draft Risk MAP Operational Standards* (which is a compilation of the standards found in the previously issued volumes and appendices of the *Guidelines and Specifications for Flood Hazard Mapping Partners* as well as *Procedure Memorandums*) and any updates or revisions thereto. Details regarding the previous source of the relevant standards for activities completed in the MAS are provided in *Tables 5.1 Applicable Standards for Project Activities* and *5.2 Project Activities and Applicable Portions of FEMA Guidelines and Specifications*. Information on the original volume and appendix of the G&S referenced for each mapping activity are summarized in Table 5.2 for convenience. All mapping partners working on a Risk MAP Project are responsible for complying with all appropriate requirements in FEMA's Draft Operational Standards and any supporting technical references and guidance documents.

The Standards and other guidelines may be accessed from the FEMA Flood Hazard Mapping website at <http://www.fema.gov/ctp-main/guidelines-specifications-flood-hazard-mapping-partners>. The Geospatial Data Coordination Policy and the Geospatial Data Coordination Implementation Guide are located at <https://hazards.fema.gov> under "Tools & Links."

**Table 5.1 – Applicable Standards for Project Activities**

Applicable Standards	Activities																	
	Perform Discovery	Outreach	Perform Field Survey	Develop Topographic Data	Perform Independent QA/QC: Topographic Data	Acquire Base Map	Coastal Analysis	Perform Independent QA/QC: Coastal Analysis	Develop Hydrologic Data	Perform Independent QA/QC: Hydrologic Data	Develop Hydraulic Data	Perform Independent QA/QC: Hydraulic Data	Perform Floodplain Mapping (inc. Redelineation)	Perform Independent QA/QC: Floodplain Mapping	Develop FIRM Database	Develop Non-Regulatory Products	Produce/Distribute Preliminary Map Products	Post-Preliminary Map Production
<i>FEMA's Draft Risk MAP Operational Standards</i>	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Guidelines and Specifications for Flood Hazard Mapping Partners and Procedure Memorandums (Replaced and Superseded by FEMA Draft Risk MAP Operational Standards)</i>	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>FEMA's Geospatial Data Coordination Policy and Coordination Implementation Guide</i>	X			X		X												
<i>Engineer Manual 1110-2-1003, Hydrographic Surveys (USACE), January 1, 2002</i>	X		X															
<i>"Numerical Models Accepted by FEMA for NFIP Usage," Updated April 2003</i>	X						X	X	X	X	X							
<i>NFIP Metadata Profile Specifications</i>	X			X	X								X	X	X	X	X	X
<i>Document Control Procedures Manual</i>	X	X														X		X
<i>44 Code of Federal Regulations Parts 65, 66 and 67</i>	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Data Sharing Agreement</i>	R		R	R		R	R		R		R							

R – As Required for use of third party data

**Table 5.2 – Project Activities and Applicable Portions of FEMA’s previous volumes of Guidelines and Specifications**

Activity Description	Applicable Volume, Section/Subsection, and Appendix
Outreach	Volume 1
	Appendix I
	OG 4-11: Risk MAP Meetings Guidance
Develop Non-Regulatory Products	Appendices N and O (draft) September 2011
	PM 59 and 65
	OG 1-11: Risk MAP Guidance for Incorporating Mitigation Planning Technical Assistance and Training into Flood Risk Projects
	OG 2-11: Operating Guidance for Creation of Risk MAP Products
	OG 3-11: Communicating Flood Risk with Risk MAP Datasets and Products
	OG 6-11: User Guidance for Flood Risk Datasets and Products
Develop Non-Regulatory Products	“Risk MAP Products in the MIP” (March 4, 2011)

## SECTION 6— SCHEDULE and BUDGET

The activities documented in this MAS No. 1 shall be completed in accordance with Table 6.1 Mapping Activities Schedule, which should drive the schedule within the MIP. If changes to this schedule are required, the responsible Mapping Partner shall coordinate with FEMA and the PMT in a timely manner.

**Table 6.1 Mapping Activities Schedule**

ACTIVITIES	RESPONSIBLE PARTNER(S)	Estimated START DATE	Estimated END DATE	Estimated COST
Outreach	*Contractor(s)	8/1/2014	10/31/2014	\$5,000
Perform Field Surveys	*Contractor(s)	10/1/2013	4/30/2014	\$308,000
Develop Hydrologic Data and Perform Independent QA/QC	*Contractor(s)	10/1/2013	7/31/2014	\$80,000
Develop Hydraulic Data and Perform Independent QA/QC	*Contractor(s)	10/1/2013	7/31/2014	\$112,000
Perform Floodplain Mapping: Detailed Riverine and Perform Independent QA/QC	*Contractor(s)	10/1/2013	7/31/2014	\$41,000
Develop DFIRM Database	*Contractor(s)	10/1/2013	7/31/2014	\$4,500
Develop Non-Regulatory Products	*Contractor(s)	8/1/2014	10/31/2014	\$20,647
<b>TOTAL COST</b>			<b>\$571,147</b>	

**\*City of Fort Worth will act as project manager to the contractor(s).**

**Include Reference to Integrated Baseline Form - See attached Fort Worth FY13 IBF**

- Prepare the Integrated Baseline Form to identify the schedule for the tasks identified within this Mapping Activities Statement, please include:
  - Activity
  - Responsible Partner(s)
  - Cost

The City of Fort Worth shall update the MIP workflow tasks with schedule and cost information within 60 days once funds are awarded.

## SECTION 7—CERTIFICATIONS

The Mapping Partner shall follow all Quality Management Standards included in FEMA's Draft Risk MAP Operational Standards. These include, however are not limited to the completion of all required:

- Quality Compliance Checks;
- Standardized Checklists;
- Self-Certification Reports;
- Documentation of all standards utilized within a Data Development task;
- Documentation of any exceptions (with appropriate exception approval);
- Citation of any know areas of non-compliance;
- Data Capture Standards;
- Floodplain Boundary Standard Report; and

- Any other documentation requirements identified within.

## ***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 mapping needs assessment and/or CNMS process from FEMA and/or your Regional Project Officer.

General technical and programmatic information can be downloaded from the FEMA website at [http://www.fema.gov/plan/prevent/fhm/frm\\_soft.shtm](http://www.fema.gov/plan/prevent/fhm/frm_soft.shtm). Specific technical and programmatic support may be provided through FEMA and/or its contractor; such assistance should be requested through the FEMA Project Officer specified in Section 12 – Points of Contact.

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.

Please contact the Regional POC to obtain the most recent version of the Risk MAP Timeline and Risk MAP Process Path.

Assistance with the MIP may be requested at [miphelp@riskmapcds.com](mailto:miphelp@riskmapcds.com)

## ***SECTION 9—CONTRACTORS***

The City of Fort Worth intends to use the services of Contractors for this Risk MAP Project. The City of Fort Worth shall ensure that the procurement for all contractors used for this Risk MAP Project complies with the requirements of 44 CFR 13.36.

Part 13 may be downloaded in PDF or text format from the United States Government Printing Office website at [http://www.access.gpo.gov/nara/cfr/waisidx\\_04/44cfr13\\_04.html](http://www.access.gpo.gov/nara/cfr/waisidx_04/44cfr13_04.html).

## ***SECTION 10—REPORTING***

Financial Reporting: Because funding has been provided to the City of Fort Worth by FEMA, financial reporting requirements for will be in accordance with Cooperative Agreement Articles. The City of Fort Worth shall also refer to 44 CFR 13.41.

The City of Fort Worth shall communicate with communities throughout the life of each project. Continued engagement is necessary and appropriate and will build upon the relationships established or enhanced during Discovery and provide transparency into the Risk MAP process. This may occur through monthly or quarterly updates or project status calls with community leaders, project websites including updates at several milestones or along a specific timeline, or other methods.

The City of Fort Worth shall provide financial reports to the FEMA Regional Project Officer and  
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Assistance Officer in accordance with the terms of the signed Cooperative Agreement for this MAS.

Status Reporting: Status reports will be submitted on a quarterly basis in accordance with the financial reporting submittals. The City of Fort Worth shall refer to 44 CFR 13.4 to obtain minimum requirements for status reporting. The Project Officer, as needed, may request additional information on status.

The City of Fort Worth may meet with FEMA and/or its contractor up to bi-weekly, or more frequently if needed, to review the progress of the project in addition to the quarterly financial and status submittals. These meetings will alternate between FEMA's Regional Office, the City of Fort Worth office, and conference calls, as necessary.

Earned Value Data Entry:

The City of Fort Worth will update the Earned Value Status on the MIP workflow monthly, in coordination with the submittal of the Monthly Progress Report.

## ***SECTION 11—PROJECT COORDINATION***

Throughout the project, all members of the Regional 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 may include:

- Meetings, teleconferences, and video conferences with FEMA and other Regional Project Team members as needed;
- Telephone conversations with FEMA and other Regional Project Team members on an ad hoc basis, as required;
- E-mail, facsimile transmissions, and letters, as required.

**SECTION 12—POINTS OF CONTACT (CTP)**

The points of contact for this Risk MAP Project are Ronald Wanhanen, PE, the FEMA Regional Project Officer; Clair Davis, PE, CFM, the Project Manager for the City of Fort Worth; or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. When necessary, any additional FEMA assistance should be requested through the FEMA Regional Project Officer.

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



Clair Davis, PE, CFM  
Project Manager  
City of Fort Worth

9/12/2013

Date



Ronald Wanhanen, PE  
Regional Project Officer  
Federal Emergency Management Agency, Region VI

9/13/13

Date