



# Clark County, Washington Cooperating Technical Partners Mapping Activity Statement

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

In accordance with the Cooperating Technical Partners (CTP) Partnership Agreement dated May 23, 2002, between the Clark County Department of Community Development (hereinafter referred to as Clark County) and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement No. 1 is as summarized below.

### 1. Objective and Scope:

The objective of this project for Clark County, Washington, is to develop a new or updated Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report for the unincorporated areas of Clark County. The DFIRM and FIS report shall be produced in the FEMA Countywide Format. Additionally, this Flood Map Project shall include developing new and/or updated flood hazard data for Salmon, Curtin and Spring Branch Creeks. Both flooding sources will be studied by detailed methods. The study for Salmon Creek will extend from its mouth to Risto Road (21.92 miles). The study for Curtin Creek will extend from its mouth to NE Padden Parkway (4.72 miles). The study for Spring Branch Creek will extend from its mouth to NE 172<sup>nd</sup> Avenue (1.31 miles).

This Flood Map Project shall be completed by the following Mapping Partners:

- Clark County Department of Community Development;
- Merrick, a contractor to Clark County;
- Michael Baker Jr., Inc., the FEMA Flood Map Production Coordination Contractor (MCC) for this Flood Map Project; and
- WEST Consultants, Inc., the FEMA Study Contractor (SC) for this Flood Map Project.

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. In Table 1-1, Clark County is identified as “CTP.” All activities that are to be accomplished by Clark County or contractors to Clark County, including contractors that may be selected after the project startup, are included in the “CTP” column.

The sections of this Mapping Activity Statement that follow Table 1-1 describe the specific mapping activities associated with this Flood Map Project. Each activity description identifies the responsible Mapping Partner(s), the FEMA standards that must be met, and resultant component(s).

**Table 1-1. Planned Mapping Activities and Project Team Assignments**

Activity	CTP	MCC	SC
Activity 1 – Field Surveys and Reconnaissance			X
Activity 2 – Topographic Data Development	X		
Activity 3 – Independent QA/QC Review of Topographic Data		X	
Activity 4 – Hydrologic Analyses			X
Activity 5–Independent QA/QC Review of Hydrologic Analyses		X	
Activity 6 – Hydraulic Analyses			X
Activity 7 – Independent QA/QC Review of Hydraulic Analyses		X	
Activity 8 – Floodplain Mapping (Detailed Riverine Analysis)			X
Activity 9 – Independent QA/QC Review of Floodplain Mapping (Revised Areas)		X	
Activity 10 – Base Map Acquisition and Preparation	X		
Activity 11 – DFIRM Production (Non-Revised Areas)		X	
Activity 12 – DFIRM Production (Merge Effective and Revised Information)		X	
Activity 12A – Application of DFIRM Graphic and Database Specifications		X	
Activity 13 – Preliminary DFIRM and FIS Report Distribution		X	
Activity 14 – Post-Preliminary Processing	X	X	X

**Activity 1 - Field Surveys and Reconnaissance**

Responsible Mapping Partner: FEMA (SC)

Scope: To supplement any field reconnaissance conducted during the scoping phase of this Flood Map Project, the SC shall conduct a detailed field reconnaissance of the specified study area. The purpose of this reconnaissance is to determine conditions along the floodplain(s), types and numbers of hydraulic and/or flood-control structures, apparent maintenance status of existing hydraulic structures, locations of cross sections to be surveyed, and other parameters needed for the hydrologic and hydraulic analyses. In addition to the initial field reconnaissance, Activity 1 includes conducting 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.

Standards: All work under Activity 1 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the Technical Support Data Notebook (TSDN) format requirements described in Appendix M of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*, the SC 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
- A survey notebook containing cross sections and structural data.

Appendix M may be viewed or downloaded from the FEMA Flood Hazard Mapping Web site at [http://www.fema.gov/mit/tsd/frm\\_gsam.pdf](http://www.fema.gov/mit/tsd/frm_gsam.pdf).

## **Activity 2 - Topographic Data Development**

Responsible Mapping Partner: Clark County

Scope: To supplement the field surveys conducted under Activity 1, additional topographic data of the overbank areas of flooding sources shall be obtained to delineate floodplain boundaries. Specifically, new topographic data shall be generated for Salmon, Curtin, and Spring Branch Creeks using airborne Light Detection and Ranging (LIDAR) technology.

Contour interval and/or accuracy for the topographic data shall be selected based on the existing FEMA guidelines and specifications.

Activity 2 also consists of developing topographic maps and/or Digital Elevation Models (DEMs) for the subject flooding sources using the data collected under Activity 1. Unless directed to do otherwise by FEMA, all new topographic data must be developed and submitted in digital format. Upon completion of topographic data collection and processing for Salmon, Curtin, and Spring Branch Creeks, these data shall be submitted to the MCC for an independent QA/QC review under Activity 3. Clark County shall address all concerns or questions regarding this Activity raised during the QA/QC review outlined in Activity 3.

Standards: All work under Activity 2 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format requirements described in Appendix M of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*, Clark County shall make the following products available to FEMA:

- Hardcopy topographic maps;
- Completed Form No. 5 of *Revisions to National Flood Insurance Program Maps, Application/Certification Forms and Instructions* (MT-2), which is available from the FEMA Flood Hazard Mapping Web site at [www.fema.gov/mit/tsd/dl\\_mt-2.htm](http://www.fema.gov/mit/tsd/dl_mt-2.htm);
- Report summarizing methodology and results;
- Mass points and breaklines data on CD-ROM;
- Digital work map with contours;
- Checkpoint analyses to assess the accuracy of data including Root Mean Square Error (RMSE) calculations to support vertical accuracy;
- Identification of remote-sensing data voids and methods used to supplement data voids;

- National Geodetic Survey (NGS) data sheets for Network Control Points used to control remote sensing and ground surveys;
- Metadata compliant with Federal Geographic Data Committee standards.

### Activity 3 - Independent QA/QC Review of Topographic Data

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall review the mapping data generated by Clark County under Activity 2 to ensure that these data are consistent with FEMA standards as well as standard engineering practice and are sufficient to prepare or revise the FIRM.

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

Products: In accordance with the TSDN format requirements described in Appendix M of FEMA’s *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC 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 arise as a result of the independent QA/QC review.

### Activity 4 – Hydrologic Analyses

Responsible Mapping Partner: FEMA (SC)

Scope: Hydrologic analyses shall be completed for approximately 89 square miles of drainage area for the flooding sources listed in Section 1 of this Mapping Activity Statement. The hydrologic methods used for these analyses are provided below.

Flooding Source	Flood Frequency Analysis of Gage(s)	Regional Regression Equations	Application of Existing HSPF Model <sup>1</sup>
Salmon Creek	X		X
Curtin Creek		X	X
Spring Branch Creek		X	

<sup>1</sup> Clark County may have a calibrated HSPF model available for use in this study.

Peak flood discharges shall be calculated for the 10-, 2-, 1- and 0.2-percent-annual-chance storm events. These flood discharges shall be the basis for subsequent hydraulic analyses of the subject flooding source(s). In addition, the SC shall address all concerns or questions regarding this Activity raised during the QA/QC review outlined in Activity 5.

Standards: All work under Activity 4 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

**Products:** Upon completion of hydrologic modeling for Salmon, Curtin, and Spring Branch Creeks, the SC shall submit the results to the MCC for an independent QA/QC review as described in Activity 5.

In accordance with the TSDN format requirements described in Appendix M of FEMA’s *Guidelines and Specifications for Flood Hazard Mapping Partners*, the SC shall make the following products available to FEMA for the flooding sources studied by detailed methods:

- Digital copies of hydrologic modeling (input and output) files for the 10-, 2-, 1-, and 0.2-percent-annual-chance storm events;
- “Summary of Discharges” table(s) presenting discharge data for each flooding source;
- Draft text for Section 3.1, Hydrologic Analyses, of FIS report;
- Appropriate SC application/certification form for hydrology; and
- All backup data used in the analysis, including work maps.

### **Activity 5 - Independent QA/QC Review of Hydrologic Analyses**

**Responsible Mapping Partner:** FEMA (MCC)

**Scope:** The MCC shall review the technical, scientific, and other information submitted by the SC under Activity 4 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practices and are sufficient to revise the FIRM. This work shall include, at a minimum, the activities summarized below.

- Review submittal for technical and regulatory adequacy, completeness of required information, application/certification forms, and supporting data and documentation. The technical review shall 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 should be retained for 3 years from the date funding recipient submits its final expenditure report to FEMA.

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

**Products:** In accordance with the TSDN format requirements described in Appendix M of FEMA’s *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC 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 arise as a result of the QA/QC review.

## Activity 6 – Hydraulic Analyses

Responsible Mapping Partner: FEMA (SC)

Scope: The SC shall perform hydraulic analyses for approximately 28 miles of Salmon, Curtin and Spring Branch Creeks. For these flooding sources, studied by detailed methods, the hydraulic modeling shall include the 10-, 2-, 1- and 0.2-percent-annual-chance storm events based on peak discharges computed under Activity 4. The hydraulic method used for this analysis shall include the standard step backwater model HEC-RAS.

The SC shall use cross-section and field data collected under Activity 1 to perform the hydraulic analyses. The hydraulic analyses shall be used to establish flood elevations and regulatory floodways for the subject flooding sources. The SC shall use the FEMA HEC-RAS checking program to check the reasonableness of the hydraulic analyses. To facilitate the independent QA/QC review under Activity 7, the SC shall provide an explanation for each unresolved message from the CHECK-RAS program, as appropriate. In addition, the SC shall address all concerns or questions regarding Activity 6 raised during the independent QA/QC review under Activity 7.

Important note for GIS-based (automated) modeling: If pre- and post- processing tools are used with a FEMA approved model, no review of these “tools” is necessary. Pre- and post-processing software tools, when used in conjunction with hydraulic models that are not currently on FEMA’s accepted model list, must be reviewed and approved by FEMA before performing work under this Activity. Similarly, if software tools were used to perform modeling routines that emulate a model on FEMA’s accepted model list, however, this source code has been rewritten to perform these tasks, these models also must be submitted to FEMA for review and approval in accordance with the conditions outlined in Subparagraph 65.6(a)(6)(i), (ii), and (iii) of the NFIP regulations.

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

Products: Upon completion of hydraulic modeling for Salmon, Curtin, and Spring Branch Creeks, the SC shall submit the results to the MCC for an independent QA/QC review as described under Activity 7. In accordance with the TSDN format requirements described in Appendix M of FEMA’s *Guidelines and Specifications for Flood Hazard Mapping Partners*, the SC 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 FEMA’s RASPLOT program or similar software;
- A Floodway Data Table for each subject flooding source that in a format compatible with the DFIRM database;
- Digital copies of all hydraulic modeling (input and output) files;
- A table showing the range of Manning’s “n” values used;
- An explanation for each unresolved message from CHECK-2 or CHECK-RAS program, as appropriate;
- All backup data used in the analyses; and
- Draft text for inclusion in Section 3.2, Hydraulic Analyses, of the FIS report.

For GIS-based modeling, products include all input and output data, intermediate data processing products, GIS data layers, and final products.

## **Activity 7 - Independent QA/QC Review of Hydraulic Analyses**

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall review the technical, scientific, and other information submitted by the SC under Activity 6 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practices and are sufficient to prepare the DFIRM. This independent QA/QC review of the hydraulic analyses shall include, at a minimum, the activities summarized below.

- Review submittal for technical and regulatory adequacy, completeness of required information, application/certification forms, and supporting data and documentation. The technical review shall focus on the following:
  - Use of acceptable models;
  - Starting water-surface elevations;
  - Cross section geometry;
  - Manning’s “n” values and expansion/contraction coefficients;
  - Bridge and culvert modeling;
  - Discharges;
  - Regulatory floodway computation methods; and
  - Tie-in to upstream and downstream non-revised profiles.
- Use the CHECK-RAS program 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 7 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format requirements described in Appendix M of FEMA’s *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC 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 arise as a result of the independent QA/QC review.

## Activity 8 – Floodplain Mapping (Detailed Riverine Analysis)

Responsible Mapping Partner: FEMA (SC)

Scope: The SC shall delineate digital floodplain and regulatory floodway boundaries for the flooding sources listed in Section 1 of this Mapping Activity Statement. The mapping shall incorporate all revised hydraulic modeling and newly acquired topographic data.

For Salmon, Curtin and Spring Branch Creeks, the SC shall delineate the floodplain boundaries for the 1- and 0.2-percent-annual-chance floods and the regulatory floodway on a digital work map based on existing topography or topographic data developed under Activity 2, which will be the basis of the revised DFIRM. The SC shall provide an explanation for selecting an existing topographic map if one is used for the floodplain boundary delineation.

The SC shall incorporate the results of all effective Letters of Map Change as appropriate. In addition, the SC shall address all concerns or questions regarding this Activity raised during the independent QA/QC review outlined in Activity 9.

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

Products: Upon completion of floodplain mapping for Salmon, Curtin, and Spring Branch Creeks, the SC shall submit the results to the MCC for an independent QA/QC review under Activity 9.

In accordance with the TSDN format requirements described in Appendix M of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*, the SC 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, Base Flood Elevations (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*;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale;
- 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 in Activity 9.

## Activity 9 - Independent QA/QC Review of Floodplain Mapping (Revised Areas)

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall review the floodplain work maps submitted by the SC under Activity 8 to ensure that the results of the hydraulic analyses are accurately represented on the work maps. This work shall include, at a minimum, the following activities:

- 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 map for proper location and agreement with the results of the hydraulic modeling.
- Review the regulatory floodway widths for agreement with the widths shown in the Floodway Data Table and the results of the hydraulic modeling.
- Review the floodplain boundaries for 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 to ensure they match the widths shown on the Floodway Data Table.
- Review the floodplain boundaries shown on the work maps to ensure they match the Flood Profiles
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- Review the flood insurance risk zone designations shown on the work maps to ensure they are properly labeled.
- Review the DFIRM mapping to ensure they are in one of the GIS file and database formats specified in the FEMA DFIRM specifications and conform to those specifications for content and attribution.
- Review the metadata files describing the DFIRM data to ensure they include the required information and follow the FEMA DFIRM specifications.

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

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

- A Summary Report that describes the findings of the independent QA/QC review noting any deficiencies and providing recommendations to resolve them or agreeing with the mapping results; and
- An annotated work map with all questions and/or concerns indicated if necessary.

## **Activity 10 - Base Map Acquisition and Preparation**

Responsible Mapping Partner: Clark County

Scope: This activity consists of obtaining the digital aerial photographic base map for the project. Clark County shall:

- Obtain digital files (raster or vector) of the base map;
- Secure necessary permissions from the map source to allow FEMA's use and distribution of hardcopy and digital map products using the digital base map, free of charge;
- Certify that the digital data meet the minimum standards and specifications that FEMA requires for DFIRM production; and
- Populate the DFIRM database for base map features and applicable data.

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

Products: In accordance with the TSDN format requirements described in Appendix M of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*, Clark County shall make the following products available to FEMA:

- Written certification that the digital data meet the minimum FEMA standards and specifications; and
- Documentation that FEMA can use the digital base map.

## **Activity 11 - DFIRM Production (Non-Revised Areas)**

Responsible Mapping Partner: FEMA (MCC)

Scope: For all flooding sources except those specified in Section 1 of this Mapping Activity Statement that will have updated flood hazard data developed under Activities 1 through 9, the MCC shall convert the effective FIRM/FBFM panels to digital format in accordance with the FEMA DFIRM specifications. The MCC shall use the base map acquired under Activity 10 for the conversion. The scope of Activity 11 covers the digitization of 12 FIRM panels and 12 FBFM panels. The MCC also shall incorporate Letters of Map Change issued by FEMA since the current effective FIRM for each affected community.

The digital flood theme for the flooding sources specified in Section 1 of this Mapping Activity Statement shall not be digitized as part of Activity 11. Rather, the MCC shall leave these as "holes" in the digital flood theme that will be filled in as part of Activity 12 using digital flood data from Activity 8.

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

Products: In accordance with the TSDN format requirements described in Appendix M of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC 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, Base Flood Elevations (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*;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale; 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 DFIRM.

## **Activity 12 – DFIRM Production (Merge Effective and Revised Information)**

Responsible Mapping Partner: FEMA (MCC)

Scope: Upon completion of Activity 8 for the revised flooding sources and Activity 11 for the effective (non-revised) flooding sources, the MCC shall merge the digital floodplain data into a single updated DFIRM. This work will include tie-in of flood hazard information with contiguous communities that were not studied as part of this project. Also, the MCC shall tie in the revised and non-revised Flood Profiles, floodplain boundaries, and regulatory floodway boundaries. The MCC shall coordinate with FEMA, Clark County, and the SC, as necessary, to resolve any potential tie-in issues.

Standards: All work under Activity 12 shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

Products: In accordance with the TSDN format requirements described in Appendix M of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC 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, Base Flood Elevations (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*;
- Complete set of plots of DFIRM panels showing all detailed flood hazard information at a suitable scale; 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 DFIRM

## Activity 12A – Application of DFIRM Graphic and Database Specifications

Responsible Mapping Partner: FEMA (MCC)

Scope: Upon completion of Activity 12, the MCC shall apply the current FEMA DFIRM graphic specifications to the DFIRM mapping files. This work shall include adding all required annotation, line patterns, area shading, and map collar information (e.g., map borders, title blocks, legends, notes to user). The MCC also shall apply the current FEMA DFIRM specifications to the database files

Standards: All work under Activity 12A shall be performed in accordance with the standards specified in Section 5 of this Mapping Activity Statement.

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

- DFIRM panels showing 1- and 0.2-percent-annual-chance floodplain boundary delineations, cross sections, BFEs, flood insurance risk zone designation 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*;
- DFIRM database files, as appropriate, 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*;
- Complete set of plots of DFIRM panels showing all effective and revised flood hazard information at a suitable scale;
- 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.

## Activity 13 – Preliminary DFIRM and FIS Report Distribution

Responsible Mapping Partner: FEMA (MCC)

Scope: Activity 13 consists of the final preparation, review, and distribution of the Preliminary copies of the DFIRM and FIS report for community and public review and comment. The activities to be performed are summarized below.

*FIS Report Preparation:* The MCC shall prepare the FIS report in the FEMA Countywide Format following the FEMA requirements specified in Appendix J of *Guidelines and Specifications for Flood Hazard Mapping Partners*.

*Quality Assurance/Quality Control:* The MCC shall conduct a final QA/QC review of the FIS report, including all data tables, profiles, and other components of the FIS report, as appropriate. The QA/QC procedures shall be consistent with FEMA standards.

*Discrepancy Resolution:* The MCC shall work with FEMA, the SC, and Clark County to resolve discrepancies identified during the final QA/QC review.

*Distribution of Preliminary DFIRM and FIS Report:* The MCC shall distribute the Preliminary copies of the FIS report and DFIRM to the affected communities, State agencies, and others as identified by FEMA.

*News Release Preparation:* The MCC shall prepare news release notifications of BFE changes as appropriate and perform a QA/QC review of each notification for accuracy and compliance with FEMA format requirements. The MCC shall file the notifications for later submittal to FEMA for review and approval.

*Preliminary Summary of Map Actions (SOMA) Preparation:* The MCC shall prepare a Preliminary SOMA for each community as appropriate. The SOMA shall list pertinent information regarding Letters of Map Change that will be affected by the issuance of the DFIRM (i.e., superseded, incorporated, revalidated).

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

Products: In accordance with the TSDN format requirements described in Appendix M of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners*, the MCC shall make the following products available when requested by FEMA:

- Preliminary transmittal letters shall be prepared. These letters and any additional letters requested by FEMA shall be prepared in accordance with the current version of the *FEMA Document Control Procedures Manual*.
- Preliminary copies of the DFIRM and FIS report, including all updated data tables and Flood Profiles, shall be mailed to the community Chief Executive Officer (CEO) and floodplain administrator of each community in Clark County, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA.
- A Preliminary SOMA for each affected community, prepared in accordance with FEMA requirements, shall be provided if appropriate.
- Revised DFIRM mapping files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided on CD-ROM;
- Revised DFIRM database files, prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided on CD-ROM.
- Revised metadata files describing the DFIRM data, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*, shall be provided on CD-ROM.
- 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.

## Activity 14 - Post-Preliminary Processing

Responsible Mapping Partners: Clark County, FEMA (SC), and FEMA (MCC)

Scope: Activity 14 consists of finalizing the DFIRM and FIS report after the Preliminary copies of the DFIRM and FIS report have been issued for public review and comment. The activities to be performed are summarized below.

*Initiation of Statutory 90-Day Appeal Period:* When required, upon completion of a 30-day community comment period and/or final coordination meeting with the community, the MCC will arrange for and verify that the following activities are completed in accordance with the current version of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners* and *Document Control Procedures Manual*:

- A proposed BFE determination letter is sent to the community CEOs and floodplain administrators as appropriate;
- News releases are published in prominent newspapers with local circulation; and
- Notices are published in the *Federal Register* as appropriate.

*Resolution of Appeals and Protests:* Clark County, the SC, and the MCC shall support FEMA in reviewing and resolving appeals and protests received during the 90-day appeal period. For each appeal and protest, the following activities shall be conducted as appropriate:

- Initial processing and acknowledgment of the submittal;
- Technical review of the submittal;
- Preparation of letters requesting additional supporting data;
- Performance of revised analyses; and
- Preparation of the draft resolution letter and revised DFIRM and FIS report materials for FEMA review.

The MCC shall mail all associated correspondence upon authorization by FEMA.

*Preparation of Special Correspondence:* Clark County, the SC, and the MCC shall support FEMA in responding to comments not received within the 90-day appeal period (referred to as “special correspondence”), including drafting responses for FEMA review when appropriate. The MCC also will mail the final correspondence and distributed appropriate copies upon receipt of authorization from FEMA.

*Revision of FIRM and FIS Report:* If necessary, Clark County, the SC, and the MCC shall work together to revise the DFIRM and FIS report at the direction of the FEMA Regional Project Officer and distribute Revised Preliminary copies of the DFIRM and FIS report.

*Processing of Letters of Final Determination:* The MCC shall work with FEMA to establish the effective date for the DFIRM and FIS report, and shall prepare a Letter of Final Determination for each affected community for FEMA review in accordance with the FEMA *Document Control Procedures Manual*. The MCC also shall mail the final correspondence and distribute appropriate copies upon receipt of authorization from FEMA.

*Final SOMA Preparation:* The MCC shall prepare a Final SOMA for each affected community as appropriate.

*Processing of Final DFIRM and FIS Report for Printing:* The MCC shall prepare final reproduction materials for the DFIRM and FIS report and provide these materials to the FEMA Map Service Center for printing by the U.S. Government Printing Office. The MCC also shall prepare the appropriate paperwork to accompany the DFIRM and FIS report, including the transmittal letters to the community CEOs, the Print Processing Worksheets, the Printing Requisition Forms, and the Community Map Actions Forms.

*Revalidation Letter Processing:* The MCC shall prepare and distribute letters to the CEO and floodplain administrator of each affected community, as appropriate, to notify the communities about Letters of Map Change for which determinations will remain in effect after the DFIRM and FIS report become effective.

*Archiving Data:* The MCC shall ensure the engineering backup data and related correspondence are packaged and stored properly in the library archives until they are transmitted to the FEMA Engineering Study Data Package Facility.

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

Products: In accordance with the requirements provided in the current versions of the FEMA *Guidelines and Specifications for Flood Hazard Mapping Partners* and *Document Control Procedures Manual*, Clark County, the SC, and/or the MCC shall make the following products available to FEMA:

- Documentation that the news releases were published in accordance with FEMA requirements;
- Documentation that the appropriate *Federal Register* notices (Proposed and Final Rules) were published in accordance with FEMA requirements;
- Draft and final Letters of Final Determination for each community and associated backup data and information for FEMA review and signature;
- Draft and final Special Correspondence and backup data and information for FEMA review and signature if appropriate;
- Draft and final Appeal and/or Protest resolution letters and enclosures and all backup data and information for FEMA review and signature if appropriate;
- Final SOMAs, as appropriate;
- DFIRM negatives and printed FIS reports, including all updated data tables and Flood Profiles;
- Paperwork for the final DFIRM and FIS report materials;
- Letter of Map Change Revalidation Letters, as appropriate; and
- Complete, organized Engineering Study Data Package.

## 2. Technical and Administrative Support Data Submittal:

The Mapping Partners that are Project Team members for this project that have responsibilities for activities included in this Mapping Activity Statement shall comply with the following data submittal requirements:

- All supporting documentation for the activities in this Mapping Activity Statement shall be submitted in accordance with Appendix M, Section M.2.1 of the *Guidelines and Specifications for Flood Hazard Mapping Partners*, prepared by FEMA, dated February 2002. Table 2-1 lists the sections of the TSDN that apply to each activity.
- If any issues arise that could affect the completion of an activity within the proposed scope or budget, the Mapping Partner responsible for that activity must complete a Special Problem Report as soon as possible after the issue is identified and submitted to FEMA. The Special Problem Report should describe the issue and propose possible resolutions.

Additionally, the MCC shall collect and maintain a set of products for all Activities and shall compile a comprehensive TSDN for the entire Flood Map Project.

## 3. Period of Performance:

The mapping activities documented in this Mapping Activity Statement will begin on September 1, 2002, and will be completed no later than August 31, 2004. The mapping activities may be terminated at the option of FEMA or Clark County in accordance with the provisions of the Partnership Agreement dated May 23, 2002.

Table 2-1. TSDN—Applicable Sections

Section of TSDN	Activities													
	1	2	3	4	5	6	7	8	9	10	11, 11A	12, 12A	13	14
<b>General Documentation</b>														
Special Problem Reports	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
Meeting Minutes/Reports	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
<b>Engineering Analyses</b>														
Hydrologic and Hydraulic Analyses	X	X		X	X	X	X							
Key to Cross-section Labeling and Key to Transect Labeling	X	X				X	X	X	X					
Draft FIS Report				X		X							X	X
Mapping Information		X						X	X	X	X	X	X	X
Miscellaneous Reference Materials	X	X	X	X	X	X	X	X	X	X	X	X	X	X

#### 4. Funding/Cost-Sharing:

FEMA is providing funding, \_\_\_\_\_ for this Flood Map Project. Clark County is providing digital topographic and elevation data for this Flood Map Project.

#### 5. Standards:

Table 5-1 lists the standards and documentation relevant to this Mapping Activity Statement. Table 5-2 lists the applicable sections of FEMA's *Guidelines and Specifications for Flood Hazard Mapping Partners* for each activity.

#### 6. Schedule:

The mapping activities documented in this Mapping Activity Statement shall be completed in accordance with the schedule below. If changes to this schedule are required, the responsible Mapping Partner shall coordinate with FEMA and the other Mapping Partners in a timely manner.

ACTIVITY	RESPONSIBLE MAPPING PARTNER	DUE DATE
Activity 1 – Field Surveys and Reconnaissance	FEMA (SC)	12/01/02
Activity 2 – Topographic Data Development	Clark County	03/31/03
Activity 3 – Independent QA/QC Review of Topographic Data	FEMA (MCC)	04/30/03
Activity 4 –Hydrologic Analyses	FEMA (SC)	12/01/02
Activity 5–Independent QA/QC Review of Hydrologic Analyses	FEMA (MCC)	01/01/03
Activity 6 – Hydraulic Analyses	FEMA (SC)	07/01/03
Activity 7 – Independent QA/QC Review of Hydraulic Analyses	FEMA (MCC)	08/01/03
Activity 8 – Floodplain Mapping (Detailed Riverine Analysis)	FEMA (SC)	09/01/03
Activity 9 – Independent QA/QC Review of Floodplain Mapping (Revised Areas)	FEMA (MCC)	10/01/03
Activity 10 – Base Map Acquisition and Preparation	Clark County	03/31/03
Activity 11 – DFIRM Production (Non-Revised Areas)	FEMA (MCC)	06/30/03
Activity 12 – DFIRM Production (Merge Effective and Revised Information)	FEMA (MCC)	11/01/03
Activity 12A – Application of DFIRM Graphic and Database Specifications	FEMA (MCC)	11/01/03
Activity 13 – Preliminary DFIRM and FIS Report Distribution	FEMA (MCC)	11/15/03
Activity 14 – Post-Preliminary Processing	Clark County, FEMA (SC), and FEMA (MCC)	10/15/04

**Table 5-1. Applicable Standards for Mapping Activities**

Applicable Standards	Activities													
	1	2	3	4	5	6	7	8	9	10	11	12, 12A	13	14
<i>Guidelines and Specifications for Flood Hazard Mapping Partners</i> , February 2002	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American Congress on Surveying and Mapping (ACSM) procedures	X	X	X											
Global Positioning System (GPS) Surveys: National Geodetic Survey (NGS-58), "Guidelines for Establishing GPS-Derived Ellipsoid Heights," November 1997	X	X	X											
EM 1000-1-1000, <i>Photogrammetric Mapping</i> , March 31, 1993	X	X	X											
EM 1110-2-1003, <i>Hydrographic Surveys</i> , October 31, 1994	X		X											
Numerical Models Accepted by FEMA for NFIP Usage, January 11, 2002				X	X	X	X							
<i>Content Standards for Digital Geospatial Metadata</i> (Federal Geographic Data Committee, 1998)		X	X					X	X	X	X	X	X	X
<i>Document Control Procedures Manual</i> , December 2000													X	X

**Table 5-2. Mapping Activities and Applicable Sections of Guidelines and Specifications for Flood Hazard Mapping Partners**

Activity Number	Activity Description	Applicable Portions of Guidelines and Specifications for Flood Hazard Mapping Partners (February 2002)
1	Field Surveys and Reconnaissance	Volume 1, Sections 1.2, 1.3, 1.4 (specifically Subsection 1.4.2.1) Appendix A, Sections A.5, A.6, A.7, and A.8 Appendices B, C, and M
2	Topographic Data Development	Volume 1, Section 1.4 (specifically Subsection 1.4.2.1) Appendix A, Sections A.2 and A.3 Appendix M
3	Independent QA/QC Review of Topographic Data	Volume 1, Section 1.4 (specifically Subsections 1.4.1 and 1.4.2.1) Appendix A, Sections A.2, A.3, A.7 (specifically Subsection A.7.5), and A.8 (specifically Subsection A.8.6) Appendix M
4	Hydrologic Analyses	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2 and 1.4.2.4) Appendix C, Sections C.1 and C.7 Appendices E, F, G, H, and M
5	Independent QA/QC Review of Hydrologic Analyses	Volume 1, Section 1.4 (specifically Subsection 1.4.1) Appendix C, Section C.2 Appendices E, F, G, H, and M
6	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
7	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
8	Floodplain Mapping (Detailed Riverine Analysis)	Volume 1, Section 1.4 (specifically Subsection 1.4.2.3) Appendix C, Sections C.4 and C.6 Appendices K, L, and M

**Table 5-2. Mapping Activities and Applicable Sections of Guidelines and Specifications for Flood Hazard Mapping Partners**

Activity Number	Activity Description	Applicable Portions of Guidelines and Specifications for Flood Hazard Mapping Partners (February 2002)
9	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 Appendices D, K, L, and M
10	Base Map Acquisition and Preparation	Volume 1, Sections 1.3 (specifically Subsection 1.3.1.8) and 1.4 (specifically Subsection 1.4.3) Appendices A and B
11	DFIRM Production (Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3 and 1.4.3.2) Appendices K, L, and M
12	DFIRM Production (Merge Effective and Revised Information)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3 and 1.4.3.3) Appendices K and L
12A	Application of DFIRM Graphic and Database Specifications	Volume 1, Section 1.4 (specifically Subsection 1.4.3) Appendices K and L
13	Preliminary DFIRM and FIS Report Distribution	Volume 1, Sections 1.4 (specifically Subsections 1.4.2 and 1.4.3) and 1.5 (specifically Subsection 1.5.1) Appendices J, K, L, and M
14	Post-Preliminary Processing	Volume 1, Section 1.5 Appendices J, K, L, and M

## 7. Certification:

The following certifications apply to this Mapping Activity Statement (as appropriate):

### **Activity 1 (Field Surveys and Reconnaissance) and Activity 2 (Topographic Data Development)**

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

### **Activity 4 (Hydrologic Analyses), Activity 6 (Hydraulic Analyses), and Activity 8 (Floodplain Mapping)**

- Hydrologic and/or hydraulic analyses and data shall be certified by a Registered Professional Engineer or Licensed Land Surveyor in accordance with 44 CFR 65.6(f).
- Topographic information shall be certified by a Registered Professional Engineer or Licensed Land Surveyor in accordance with 44 CFR 65.5(c).
- Any levee systems to be accredited shall be certified in accordance with 44 CFR 65.10(e).

### **Activity 10 (Base Map Acquisition and Preparation)**

- A community official or responsible party shall provide written certification that the digital data meet the FEMA minimum standards and specifications.
- The responsible Mapping Partner shall provide documentation that the digital base map can be used by FEMA.

### **Activities 8 (Floodplain Mapping) and Activity 11 (DFIRM Production – Non-Revised Areas)**

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

## 8. Technical Assistance and Resources:

Clark County and the SC may obtain copies of FEMA-issued Letters of Map Change, archived engineering backup data, and data collected as part of the Mapping Needs Assessment Process from the MCC. The MCC may be contacted by telephone at (703) 317-6531 or by facsimile at (703) 329-3023.

General technical and programmatic information, such as FEMA 265, the Quick-2 computer program, and the MT-2 forms, can be downloaded from the FEMA Web site ([www.fema.gov/mit/tsd/](http://www.fema.gov/mit/tsd/)). Specific technical and programmatic support may be provided through the MCC; such assistance should be requested through the FEMA MCC Project Officer specified in Section 11 of this Mapping Activity Statement.

Clark County and the SC 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.

## **9. Contractors:**

Clark County plans to retain the services of Merrick for this Flood Map Project. Clark County shall ensure that procurement of contractors for work on this Flood Map Project complies with the requirements of 44 CFR 13.36. FEMA plans to retain the services of WEST Consultants, Inc., for this Flood Map Project.

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\\_01/44cfr13\\_01.html](http://www.access.gpo.gov/nara/cfr/waisidx_01/44cfr13_01.html).

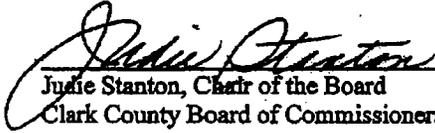
## **10. Financial Reporting:**

No funding has been provided to Clark County for this Flood Map Project. Therefore, Clark County is not required to submit financial reports to FEMA for the completed work.

## **11. Points of Contact:**

The points of contact for this Flood Map Project are Joe Weber, the FEMA Regional Project Officer; Richard Drinkwater, the CTP Project Manager; or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. When necessary, the assistance of the FEMA MCC should be requested through the FEMA MCC Project Officer, Mike Grimm.

Each party has caused this Mapping Activity Statement to be executed by its duly authorized representative.

  
Julie Stanton, Chair of the Board  
Clark County Board of Commissioners

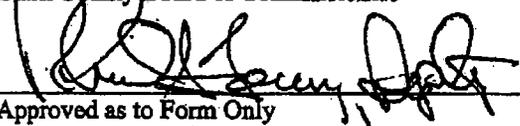
9-3-02  
Date

\_\_\_\_\_  
Craig Pridemore, Commissioner  
Clark County Board of Commissioners

\_\_\_\_\_  
Date

\_\_\_\_\_  
Betty Sue Morris, Commissioner  
Clark County Board of Commissioners

\_\_\_\_\_  
Date

  
Approved as to Form Only  
Arthur D. Curtis, Clark County Prosecuting Attorney

8-27-02  
Date

  
Joseph Weber, Regional Project Officer  
Federal Emergency Management Agency, Region X

9/05/02  
Date

\_\_\_\_\_  
Tim D'Acci, State NFIP Coordinator  
Washington State Department of Ecology

\_\_\_\_\_  
Date

\_\_\_\_\_  
Michael Grimm, Project Officer, Western Studies Team  
Federal Emergency Management Agency

\_\_\_\_\_  
Date