



City of Renton, Washington Cooperating Technical Partners Mapping Activity Statement

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

In accordance with the Cooperating Technical Partners (CTP) Partnership Agreement dated October 7, 2003, between the City of Renton, King County, Washington, and the Federal Emergency Management Agency (FEMA), Mapping Activity Statement (MAS) No. 1 is as follows.

SECTION 1—OBJECTIVE AND SCOPE

The objective of the Flood Map Project documented in this MAS is to develop a revised Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report for the City of Renton. The revised DFIRM and FIS report will be produced in the FEMA Countywide Format.

In addition the Mapping Partners involved in this project will develop new and/or updated flood hazard data for Springbrook Creek from SW 43rd Street to the Black River Pump Station, a reach of approximately 3.43 miles.

This Flood Map Project will be completed by the following

- City of Renton;
- R.W. Beck, Inc., a contractor to the City of Renton for this Flood Map Project;
- Northwest Hydraulic Consultants (NHC), a subcontractor to R.W. Beck for this Flood Map Project; and
- Michael Baker Jr., Inc., the FEMA Flood Map Production Coordination Contractor (MCC) or other FEMA contractor.

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. The sections of this MAS that follow Table 1-1 describe the specific activities, responsible Mapping Partner(s), FEMA standards that must be met, and resultant map components. In Table 1-1, the City of Renton is identified as “CTP.” All activities that are to be accomplished by the City of Renton, R.W. Beck, NHC, or other contractors to the City of Renton that might be selected at a later date are included in the “CTP” column.

Table 1-1. Summary of Project Activities

Activities	CTP	FEMA (MCC)
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	X	
Activity 11 – DFIRM Production (Non-Revised Areas)		X
Activity 12 – DFIRM Production (Merging Revised and Non-Revised Information)		X
Activity 12A – DFIRM Production (Application of DFIRM Graphics and Database Specifications)		X
Activity 13 – Preliminary DFIRM and FIS Report Distribution		X
Activity 14 – Post-Preliminary Processing	X	X

Activity 1 - Field Surveys and Reconnaissance

Responsible Mapping Partner: City of Renton and R.W. Beck

Scope: To supplement any field reconnaissance conducted during the Project Scoping phase of this project, R.W. Beck shall conduct a detailed field reconnaissance of Springbrook Creek to note any change in roughness or additional hydraulic features that have been added since the current hydraulic model was developed.

In addition to the initial field reconnaissance, R.W. Beck shall conduct a validation of cross sections that were used in the model that were not “as-built.” The validation will consist of comparing selected modeled cross sections with surveyed cross sections. Up to six cross sections will be selected for survey and comparison. It is assumed that no more than 3 days in the field for survey work is required. R.W.

Beck also shall coordinate with other Mapping Partners that are collecting topographic data under Activity 2.

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

Deliverables: In accordance with the Technical Support Data Notebook (TSDN) format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, R.W. Beck or the City of Renton shall make the following products available to FEMA:

- Photographs documenting the current channel and bank roughness.
- List of information sources used for the Flood Map Project; and
- A memorandum discussing the validation results and recommendations.

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

Activity 2 - Topographic Data Development

Responsible Mapping Partner: City of Renton and R.W. Beck

Scope: The City of Renton and R.W. Beck shall provide topographic base mapping to be used to delineate floodplain boundaries. Specifically, the City shall generate 2-foot-contour-interval topographic mapping for Springbrook Creek using the existing digital mapping that was prepared in metric (0.5-meter contour interval) and done in accordance with National Map Accuracy Standards. The City will convert the existing to imperial units (2-foot contour). The topographic mapping and all other mapping for this Flood Map Project shall be prepared using the North American Vertical Datum of 1988.

In addition, the City shall address concerns or questions regarding Activity 2 that are raised by the MCC during the independent QA/QC review under Activity 3.

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

Deliverables: Upon completion of topographic data collection and processing for Springbrook Creek, the City shall submit these data to the MCC for an independent QA/QC review under Activity 3. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the City of Renton and/or R.W. Beck shall make the following products available to FEMA:

- Hardcopy topographic maps;
- Report summarizing methodology and results;
- Mass points and breaklines data on CD-ROM;
- Digital work maps with contours;
- Checkpoint analyses to assess the accuracy of data, including Root Mean Square Error calculations to support vertical accuracy;
- Identification of remote-sensing data voids and methods used to supplement data voids;

- National Geodetic Survey data sheets for Network Control Points used to control remote- sensing and ground surveys; and
- Metadata (description of the horizontal and vertical accuracy of the base map) compliant with Federal Geographic Data Committee standards.

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

Activity 3 - Independent QA/QC Review of Topographic Data

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall review the mapping data generated by the City of Renton under Activity 2 to ensure that these data are consistent with FEMA standards and standard engineering practice and are sufficient to prepare the DFIRM.

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *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 are identified during the independent QA/QC review.

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

Activity 4 – Hydrologic Analyses

Responsible Mapping Partner: Northwest Hydraulic Consultants (NHC) and City of Renton

Scope: NHC shall perform hydrologic analyses for approximately 25 square miles of drainage area for Springbrook Creek. NHC shall calculate peak flood discharges for the 10-, 2-, and 1-percent-annual-chance storm events using the HSPF hydrologic model and methods outlined in the technical memorandum entitled “PROPOSED METHODOLOGY FOR HYDROLOGIC AND HYDRAULIC ANALYSIS OF LOWER SPRINGBROOK CREEK PURSUANT TO 2002 FLOODPLAIN RE-MAPPING” (NHC, 2002), which was submitted and duly reviewed by the City of Renton; King County; the U. S. Army Corps of Engineers, Seattle District; FEMA; and the MCC. These flood discharges will be the basis for subsequent hydraulic analyses under Activity 6. In addition, NHC and/or the City of Renton shall address all concerns or questions regarding Activity 4 that are raised during the independent QA/QC review performed by the MCC under Activity 5.

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

Deliverables: Upon completion of hydrologic modeling for Springbrook Creek, NHC or the City of Renton shall submit the results to the MCC for an independent QA/QC review under Activity 5. In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, NHC or the City of Renton shall make the following products available to FEMA:

- Digital copies of all hydrologic modeling (input and output) files for the 10-, 2-, and 1-percent-annual-chance storm events;
- Digital and hardcopy versions of the Summary of Discharges Table presenting discharge data for the flooding sources for which hydrologic analyses were performed;
- Digital and hardcopy versions of a memorandum documenting the hydrologic analysis for Springbrook Creek that is sufficient to meet the requirements for Section 3.1 of the FIS report as documented in Appendix J, Subsection J.1.3 of *Guidelines and Specifications for Flood Hazard Mapping Partners*; and
- Digital and hardcopy versions of all relevant backup data used in the analysis, including work maps.

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

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 NHC or the City of Renton under Activity 4 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practice and are sufficient to prepare the DFIRM. This work shall include, at a minimum, the activities listed below.

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

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the 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 are identified during the independent QA/QC review.

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

Activity 6 – Hydraulic Analyses

Responsible Mapping Partner: R.W. Beck, NHC, and City of Renton

Scope: R.W. Beck shall perform hydraulic analyses for approximately 3.43 miles of Springbrook Creek. The modeling will include the 10-, 2-, and 1-percent-annual-chance events based on peak discharges computed under Activity 4. The hydraulic methods used for this analysis will include the FEQ model.

R.W. Beck shall use the existing FEQ model updated with any changes defined in Activity 1 to perform the hydraulic analyses. The analysis approach will generally follow the approach outlined in the technical memorandum entitled “PROPOSED METHODOLOGY FOR HYDROLOGIC AND HYDRAULIC ANALYSIS OF LOWER SPRINGBROOK CREEK PURSUANT TO 2002 FLOODPLAIN RE-MAPPING” (NHC, 2002). The hydraulic analyses will be used to establish flood elevations and a regulatory floodway for Springbrook Creek. Also, R.W. Beck and/or the City of Renton shall address all concerns or questions regarding Activity 6 that are raised by the MCC during the independent QA/QC review under Activity 7.

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

Deliverables: Upon completion of hydraulic modeling for Springbrook Creek, R.W. Beck or the City of Renton shall submit the results to the MCC for an independent QA/QC review under Activity 7. In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, R.W. Beck or the City of Renton shall make the following products available to FEMA:

- Digital profiles of the 10-, 2-, and 1-percent-annual-chance water-surface elevations representing existing conditions using the FEMA RASLOT program or similar software;
- Digital and hardcopy versions of the Floodway Data Table for each flooding source that is compatible with the DFIRM database;
- Digital and hardcopy versions of all hydraulic modeling (input and output) files;
- Digital and hardcopy versions of table with range of Manning’s “n” values;
- Digital and hardcopy versions of all relevant backup data used in the analyses; and

- Digital and hardcopy versions of a memorandum documenting the hydraulic analysis for Springbrook Creek that is sufficient to meet the requirements for Section 3.2 of the FIS report as documented in Appendix J, Subsection J.1.3 of *Guidelines and Specifications for Flood Hazard Mapping Partners*.

These Activity 6 deliverables will be submitted along with the deliverables for Activity 8.

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

Activity 7 - Independent QA/QC Review of Hydraulic Analyses

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall review the technical, scientific, and other information submitted by R.W. Beck or the City of Renton under Activity 6 to ensure that the data and modeling are consistent with FEMA standards and standard engineering practice and are sufficient to revise the FIRM. This work shall include, at a minimum, the activities listed below.

- Review the submittal for technical and regulatory adequacy, completeness of required information, and supporting data and documentation. The technical review is to focus on the following:
 - Use of acceptable model(s);
 - Starting water-surface elevations;
 - Cross-section geometry;
 - Manning's "n" values and expansion/contraction coefficients;
 - Bridge and culvert modeling;
 - Flood discharges;
 - Regulatory floodway computation methods; and
- Tie-in to upstream and downstream non-revised Flood Profiles
- 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 MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *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 are identified during the independent QA/QC review.

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

Activity 8 - Floodplain Mapping (Detailed Riverine Analysis)

Responsible Mapping Partner: R.W. Beck, NHC, and City of Renton

Scope: R.W. Beck shall delineate the 1-percent-annual-chance floodplain boundaries and the regulatory floodway boundaries for Springbrook Creek. R.W. Beck shall incorporate all new or revised hydrologic and hydraulic analyses and shall use the topographic data acquired under Activity 2 to delineate the floodplain and regulatory floodway boundaries on a digital work map. In addition, R.W. Beck shall incorporate the results of all effective Letters of Map Change (LOMCs) within the revised areas as appropriate. Upon completion of the floodplain mapping, R.W. Beck shall submit the floodplain mapping to NHC for an independent QA/QC review for consistency with FEMA mapping (formatting) standards before the mapping is submitted to the MCC for an independent QA/QC review under Activity 9. Also, R.W. Beck or the City of Renton shall address all concerns or questions regarding Activity 8 that are raised by the MCC during the independent QA/QC review under Activity 9.

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

Deliverables: Upon completion of the floodplain mapping, R.W. Beck or the City of Renton shall submit the results to the MCC for an independent QA/QC review under Activity 9. In accordance with the TSDN format described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, R.W. Beck or the City of Renton shall make the following products available to FEMA:

- Digital, Computer-Assisted Drafting (CAD)-generated work maps showing the 1- percent-annual-chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, flood insurance risk zone labels, and all applicable base map features;
- Draft updates to existing DFIRM mapping for King County, Washington and Incorporated Areas by providing an updated portion for Springbrook Creek (in NAVD88 datum), prepared in accordance with the requirements in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Updates to existing metadata files describing the DFIRM data for King County, Washington and Incorporated Areas, including all required information shown in *Guidelines and Specifications for Flood Hazard Mapping Partners*;
- Complete set of plots of CAD-generated work maps 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 CAD-generated work maps;
- Any backup or supplemental information used in the mapping required for the independent QA/QC review outlined under Activity 9; and
- An explanation for the use of existing topography for the studied reaches, if appropriate.

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

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

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall review the floodplain mapping submitted by R.W. Beck or the City of Renton under Activity 8 to ensure that the results of the analyses performed are accurately represented, the work maps are consistent with current FEMA standards, and the work maps are sufficient to prepare the DFIRM. This work shall include, at a minimum, the activities listed below.

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

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

Deliverables: In accordance with the TSDN format described in Appendix M of *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 QA/QC review, noting any deficiencies in or agreeing with the mapping results;
- Recommendations to resolve any problems that are identified during the independent QA/QC review; and
- An annotated work map with all questions and/or concerns indicated, if necessary.

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

Activity 10 - Base Map Acquisition

Responsible Mapping Partner: City of Renton and R.W. Beck

Scope: The City of Renton and R.W. Beck shall provide the digital base map. The required activities are as follows:

- 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.
- Populate the DFIRM database with the information required by FEMA.

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the City of Renton and/or R.W. Beck shall make the following products available to FEMA:

- Written certification that the digital data meet the minimum standards and specifications;
- Documentation that FEMA can use the digital base map; and
- Digital work map (submitted under Activity 8).

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

Activity 11 – DFIRM Production (Non-Revised Areas)

Responsible Mapping Partner: FEMA (MCC)

Scope: For all flooding sources except the segment of Springbrook Creek for which updated flood data will be developed under Activities 1 through 8, the MCC shall convert the information shown on the effective DFIRM for King County, Washington and Incorporated Areas, as appropriate, in accordance with FEMA DFIRM specifications. The MCC shall use the base map acquired under Activity 10 for the conversion. The scope of Activity 11 covers the revision of 3 DFIRM panels. The MCC also shall ensure that the results of LOMCs issued by FEMA since the date of the current effective DFIRM panels have been incorporated properly for flooding sources other than Springbrook Creek.

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, R.W. Beck or the City of Renton shall make the following products available to FEMA:

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

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

Activity 12 –DFIRM Production (Merging Revised and Non-Revised Information)

Responsible Mapping Partner: FEMA (MCC)

Scope: Upon completion of the floodplain mapping activities for the revised flooding source (Activity 8) and the DFIRM production for non-revised areas (Activity 11), the MCC shall merge the digital floodplain data into a single, updated DFIRM. This work is to include tie-in of flood hazard information for areas that were not studied as part of the Flood Map Project documented in this MAS. The MCC also shall tie in the revised and non-revised Flood Profiles, floodplain boundaries, and regulatory floodway boundaries with contiguous communities that were not studied as part of the Flood Map Project documented in this MAS.

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, R.W. Beck or the City of Renton shall make the following products available to FEMA:

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

- 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.

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

Activity 12A – DFIRM Production (Application of DFIRM Graphics and Database Specifications)

Responsible Mapping Partner: FEMA (MCC)

Scope: The MCC shall apply the final FEMA DFIRM graphic and database specifications to the DFIRM files produced under Activity 12. This work shall include adding all required annotation, line pattern, area shading, and map collar information (e.g., map borders, title blocks, legends, notes to user). The MCC shall coordinate with those Mapping Partners responsible for Activities 8, 11, and 12, as necessary, to resolve any problems that are identified during Activity 12A.

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners*, the 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, 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.

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

Activity 13 - Preliminary DFIRM and FIS Report Distribution

Responsible Mapping Partners: 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 official and general public review and comment. The activities to be performed are summarized below.

Preliminary Transmittal Letter Preparation. The MCC shall prepare letters to transmit the Preliminary copies of the DFIRM and FIS report and related enclosures to all affected communities, all other Project Team members, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA.

Final QA/QC Review of Preliminary DFIRM and FIS Report: The MCC shall perform a final QA/QC review of the Preliminary DFIRM and FIS report, including all data tables, Flood Profiles, and other components of the FIS report. The QA/QC review procedures shall be consistent with the *Guidelines and Specifications for Flood Hazard Mapping Partners*.

Discrepancy Resolution: The MCC shall work with City of Renton, R.W. Beck, NHC, and FEMA as appropriate 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 DFIRM and FIS report to all affected communities, all other Project Team members, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA.

News Release Preparation: The MCC shall prepare news release notifications of BFE changes for all affected communities if appropriate and perform QA/QC reviews of the notifications for accuracy and compliance with FEMA format requirements. The MCC shall file the notifications for later submittal to FEMA for review.

Preliminary Summary of Map Actions (SOMA) Preparation: The MCC shall prepare Preliminary SOMAs for all affected communities if appropriate. The SOMA shall list pertinent information regarding LOMCs 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 MAS.

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners* and the requirements documented in Section 1 and Appendix A of the *FEMA Document Control Procedures Manual*, the MCC shall make the products listed below available to 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 Chief Executive Officer (CEO) and floodplain administrator of each affected community, all other Project Team members, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA.
- Preliminary SOMAs, prepared in accordance with FEMA requirements, shall be mailed with the Preliminary copies of the DFIRM and FIS report when 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 shall be provided.

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

Activity 14 - Post-Preliminary Processing

Responsible Mapping Partners: FEMA (MCC) and City of Renton

Scope: Activity 14 consists of finalizing the DFIRM and FIS report after the Preliminary copies of the DFIRM and FIS report have been issued to community officials and the public for 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 affected communities, the MCC and City of Renton shall 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*:

- Proposed BFE determination letters are sent to the community CEOs and floodplain administrators.
- News release notifications of BFE changes are published in prominent newspapers with local circulation.
- The appropriate notices (Proposed Rules) are published in the *Federal Register*.

Resolution of Appeals and Protests: The MCC and the City of Renton 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 submittal;
- Technical review of submittal;
- Preparation of letter(s) requesting additional supporting data;
- Performance of revised analyses; and
- Preparation of a 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: The MCC and the City of Renton 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 and finalizing responses when requested by FEMA. The MCC also shall mail the final correspondence (and enclosures if appropriate) and distribute appropriate copies of the correspondence and enclosures upon receipt of authorization from FEMA.

Revision of DFIRM and FIS Report: If necessary, the MCC and the City of Renton 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 to the CEO and floodplain administrator of each affected community, all other Project Team members, the State NFIP Coordinator, the FEMA Regional Office, and others as directed by FEMA.

Final SOMA Preparation: The MCC shall prepare Final SOMAs for the affected communities as appropriate.

Processing of Letter of Final Determination: The MCC and the City of Renton shall work with FEMA to establish the effective date for the DFIRM and FIS report, and shall prepare a Letter of Final Determination (LFDs) for each affected community for FEMA review in accordance with the FEMA *Document Control Procedures Manual*. The MCC also shall mail the final signed LFDs and enclosures and distribute appropriate copies of the signed LFDs and enclosures (including the Final SOMA and the Final Rule for publication in the *Federal Register*, when appropriate) upon receipt of authorization from FEMA.

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 Print Processing Worksheet, Printing Requisition Forms, and Community Map Actions Form) and transmittal letters to the community CEOs.

Revalidation Letter Processing. The MCC shall prepare and distribute letters to the community CEOs and floodplain administrators to notify the affected communities about LOMCs for which determinations will remain in effect after the DFIRM and FIS report become effective.

Archiving Data: The MCC shall ensure that technical and administrative support data are packaged in the FEMA-required TSDN format and stored properly in the library archives.

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

Deliverables: In accordance with the TSDN format described in described in Appendix M of *Guidelines and Specifications for Flood Hazard Mapping Partners* and the requirements documented in Section 1 and Appendix A of the FEMA *Document Control Procedures Manual*, the MCC and the City of Renton 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 Special Correspondence (and all associated enclosures, backup data, and other related information) for FEMA review and signature as appropriate;

- Draft and final Appeal and Protest acknowledgment, additional data, and resolution letters (and all associated enclosures, backup data, and other related information) for FEMA review and signature as appropriate;
- Draft and final LFDs (and all associated enclosures, backup data, and other related information) for FEMA review and signature;
- DFIRM negatives and final FIS report materials, including all updated data tables and Flood Profiles;
- Paperwork for the final DFIRM and FIS report materials;
- Transmittal letters for the printed DFIRM and FIS report;
- LOMC Revalidation Letters if appropriate; and
- Complete, organized archived technical and administrative support data.

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

SECTION 2—TECHNICAL AND ADMINISTRATIVE SUPPORT DATA SUBMITTAL

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

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

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

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

Table 2-1. Mapping Activities and Applicable TSDN Sections

TSDN Section	Activities													
	1	2	3	4	5	6	7	8	9	10	11	12, 12A	13	14
General Documentation														
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
Engineering Analyses														
Hydrologic Analyses	X			X	X	X	X	X	X					
Hydraulic Analyses	X			X	X	X	X	X	X					
Key to Cross-Section Labeling	X			X	X	X	X	X	X					
Draft FIS Report				X	X	X	X							
Mapping Information		X	X					X	X	X	X	X	X	X
Miscellaneous Reference Information	X	X	X	X	X	X	X	X	X	X	X	X	X	X

SECTION 3—PERIOD OF PERFORMANCE

The mapping activities outlined in this MAS will begin on October 15, 2003, and will be completed no later than September 30, 2005. The mapping activities may be terminated at the option of FEMA or the City of Renton in accordance with the provisions of the Partnership Agreement dated October 7, 2003.

SECTION 4—FUNDING/COST-SHARING

The City of Renton shall provide all resources required to complete the activities assigned to the City, R.W. Beck, and NHC for this Flood Map Project. FEMA shall provide the resources required to complete the activities assigned to FEMA and its MCC for this Flood Map Project.

SECTION 5—STANDARDS

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

Table 5-1. Applicable Standards for Project 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> , April 2003	X	X	X	X	X	X	X	X	X	X	X	X	X	X
American Congress on Surveying and Mapping Procedures	X													
Global Positioning System (GPS) Surveys: National Geodetic Survey (NGS-58), "Guidelines for Establishing GPS-Derived Ellipsoid Heights," November 1997	X													
Engineer Manual 1110-1-1000, <i>Photogrammetric Mapping (USACE)</i> , July 1, 2002	X													
Engineer Manual 1110-2-1003, <i>Hydrographic Surveys (USACE)</i> , January 1, 2002	X													
"Numerical Models Accepted by FEMA for NFIP Usage," Updated April 2003				X	X	X	X							
<i>Content Standard for Digital Geospatial Metadata</i> (Federal Geographic Data Committee), 1998		X	X					X	X	X	X	X	X	X
<i>Document Control Procedures Manual</i> , December 2000												X	X	X

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

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
1	Field Surveys and Reconnaissance	Volume 1, Sections 1.2, 1.3, 1.4 (specifically Subsection 1.4.2.1) Appendix A, Sections A.4, 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, A.3, A.7 and A.8 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 A, Section A.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 A, Section A.4 Appendix C, Section C.2 Appendices E, F, G, H, and M

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

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
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
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 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 Subsections 1.4.3.1 and 1.4.3.2) Appendix A, Section A.1 (specifically Subsection A.1.1)
11	DFIRM Production (Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.2, 1.4.2.3, and 1.4.3.2) Appendices K, L, and M

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

Activity Number	Activity Description	Applicable Volume, Section/Subsection, and Appendix
12	DFIRM Production (Merging Revised and Non-Revised Areas)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3 and 1.4.3.3) Appendices K and L
12A	DFIRM Production (Application of DFIRM Graphics and Database Specifications)	Volume 1, Section 1.4 (specifically Subsections 1.4.2.3, 1.4.3.3, 1.4.3.9, and 1.4.3.10) 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 (specifically Subsection 1.5.2) Appendices J, K, L, and M

SECTION 6—SCHEDULE

The activities documented in this MAS shall be completed in accordance with the project schedule presented in Table 6-1. If changes to this schedule are required, the responsible Mapping Partner shall coordinate with FEMA and the other Mapping Partners in a timely manner. As in Table 1-1 earlier in this MAS, the City of Renton is identified as “CTP.” All activities that are to be accomplished by the City of Renton, R.W. Beck, NHC, or other contractors to the City of Renton that might be selected at a later date are assigned to “CTP” in the Responsible Partner(s) column in Table 6-1.

Table 6-1. Project Schedule

ACTIVITIES	RESPONSIBLE PARTNER(S)	DATE DUE
Activity 1 – Field Surveys and Reconnaissance	CTP	09-30-03
Activity 2 – Topographic Data Development	CTP	09-30-03
Activity 3 – Independent QA/QC Review of Topographic Data	FEMA (MCC)	10-31-03
Activity 4 – Hydrologic Analyses	CTP	11-30-03
Activity 5 – Independent QA/QC Review of Hydrologic Analyses	FEMA (MCC)	12-31-03
Activity 6 – Hydraulic Analyses	CTP	01-31-04
Activity 7 – Independent QA/QC Review of Hydraulic Analyses	FEMA (MCC)	02-28-04
Activity 8 – Floodplain Mapping (Detailed Riverine Analysis)	CTP	03-31-04
Activity 9 – Independent QA/QC Review of Floodplain Mapping (Revised Areas)	FEMA (MCC)	04-30-04
Activity 10 – Base Map Acquisition	CTP	11-30-03
Activity 11 – DFIRM Production (Non-Revised Areas)	FEMA (MCC)	05-15-04
Activity 12 – DFIRM Production (Merging Revised and Non-Revised Information)	FEMA (MCC)	07-15-04
Activity 12A – Application of DFIRM Graphic and Database Specifications	FEMA (MCC)	08-15-04
Activity 13 – Preliminary DFIRM and FIS Report Distribution	FEMA (MCC)	09-01-04
Activity 14 – Post-Preliminary Processing	CTP, FEMA (MCC)	09-30-05

SECTION 7—CERTIFICATIONS

The following certifications apply to this MAS:

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

A Registered Professional Engineer shall certify the hydrologic and hydraulic analyses and data in accordance with 44 CFR 65.6(f).

Activity 8 (Floodplain Mapping– Detailed Riverine Analysis), Activity 9 (Independent QA/QC Review of Floodplain Mapping {Revised Areas}), Activity 11 (DFIRM Production {Non-Revised Areas}), Activity 12 (DFIRM Production {Merging Revised and Non-Revised Information}), and Activity 12A (DFIRM Production {Application of DFIRM Graphics and Database Specifications})

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

Activity 10 (Base Map Acquisition and Preparation)

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

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 Process from the MCC, who may be contacted by telephone at 703-317-3062 or by facsimile at 703-317-3023.

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

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

SECTION 9—CONTRACTORS

The City of Renton intends to use the services of R.W. Beck, Inc., and Northwest Hydraulic Consultants as contractors for this Flood Map Project. The City of Renton shall ensure that the procurement for all contractors used for this Flood Map Project complies with the requirements of 44 CFR 13.36.

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

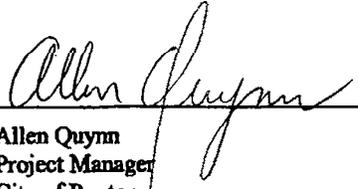
SECTION 10—FINANCIAL REPORTING

Because funding has not been provided to the City of Renton by FEMA for this Flood Map Project, no financial reporting by the City of Renton is required.

SECTION 11—POINTS OF CONTACT

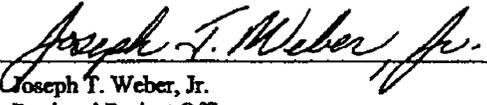
The points of contact for this Flood Map Project are Joe Weber, the FEMA Regional Project Officer; Allen Quynn, the Project Manager for the City of Renton; or subsequent personnel of comparable experience who are appointed to fulfill these responsibilities. When necessary, the assistance of the MCC should be requested through the FEMA Project Officer, Max Yuan.

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



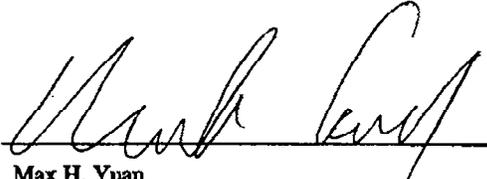
Allen Quym
Project Manager
City of Renton

10/6/03
Date (Printed)



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

10/03/2003
Date (Printed)



Max H. Yuan
Project Officer
Federal Emergency Management Agency

10-3-03
Date (Printed)



Dan Sokol
State NFIP Coordinator
Washington State Department of Ecology

10/03/2003
Date (Printed)