



Washington County, Minnesota Cooperating Technical Partner Mapping Activity Statement

SEP 23 2003
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FEMA

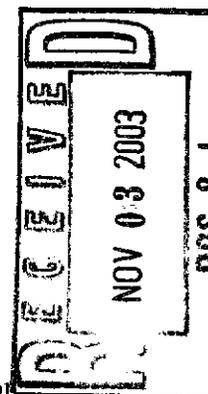
Agreement 2003-03 Hydrologic and Hydraulic Modeling and Floodplain Mapping

In accordance with the CTP Memorandum of Agreement dated September 1, 2000, between Washington County and the Federal Emergency Management Agency, Task Agreement 2003-3 is as follows:

- Objective and Scope:** There are two objectives of this Mapping Activity Statement (MAS). These are:

Objective 1.1: Detailed hydrologic and hydraulic analyses and floodplain mapping for Valley and Eagle Point Creeks for approximately 20 miles of stream. These streams have been of concern to the local watershed district due to urban development pressures. While existing models exist for a portion of these streams, a comparison of these datasets with more recent topographic maps suggests changed hydraulic conditions and errors in stream distance between cross-sections. New peak discharges will be developed for 10%, 2%, 1% and 0.2% annual chance design storms using XP-SWMM or similar multi-subbasin routing procedures and rainfall-runoff computations. New hydraulic modeling shall include compilation flood profiles and floodways based on National Flood Insurance Program guidelines and Minnesota State Statutes. Digital topography, available through Washington County, will be used to create cross-sectional data in overbank areas, and new survey will be used to supplement or replace existing data at bridge or culvert geometry where available. Similarly, channel bathymetry will be obtained based on a mix of existing cross-sectional data and new survey data. Upon completion, the new data will be calibrated against historical records where possible, and final results of the hydrologic model will be forwarded to the Minnesota Inter-agency Hydrologic Review Committee for review and concurrence. That modeling data will be incorporated into digital work maps registered to the County's 2000 digital base map subject to appropriate certifications.

Objective 1.2: Delineation of Washington County Non-priority Basins using approximate methods. A list of these basins (primarily land-locked basins without current development pressure) is shown in the attached table. The delineation process shall assume that the months-long inundation in 1996, as captured by rectified aerial photography, represent a near 1% annual chance occurrence. The delineation process shall include the tabulation of elevations and shall be based on a process whereby the photographs will be overlain on the county's digital topography and elevation points registered at the perimeter will be averaged. The delineation of basin boundaries will be registered to the County's 2000 digital base map.



2. **Period of Performance:** The period of performance will be in accordance with Article II of the Cooperative Agreement grant documents.

3. **Funding/Cost-Sharing:**

4. **Standards:** Otherwise specified, the activities in this agreed shall comply with the Guidelines and Specifications for Flood Hazard Mapping Partners (referred to herein as the *Guidelines*), dated February 2002 or updated by FEMA through website portal. A complete and current version of the *Guidelines* can be found at www.fema.gov/fhm/dl_cgs.shtm. The following standards are specific to this agreement:

- Detailed hydrologic and hydraulic analyses, floodway modeling and floodplain mapping will follow the standards set forth in the *Guidelines*. In addition, the floodway shall conform to all applicable state and/or community requirements.
- Computer models used for hydrologic and/or hydraulic analyses are limited to those included on FEMA's list of accepted numerical models for NFIP usage as found at www.fema.gov/mit/tsd/en_modl.htm
- Topographic mapping used to delineate floodplains and floodways will be of adequate scale and topographic definition to provide reasonable accuracy. Planimetric features will be compatible with the base map (with respect to horizontal accuracy) selected by FEMA for Digital FIRM production. Topographic mapping taken from aerial photogrammetry or surveys will comply with the requirements of Appendix A of the *Guidelines*.
- Map revision data incorporated on a per-project basis for fill placement, channel modifications, levees or bridge/culvert placement will comply with Subpart 65 of Title 44 of the Code of Federal Regulations (CFR) as found at www.access.gpo.gov/nara/cfr/waisidx_02/44cfrv1_02.html
- Base map materials used shall conform to standards detailed in Volume 1, Sections 1.3 (specifically Subsection 1.3.1.8) and 1.4 (specifically Subsection 1.4.3) and Appendices A and B of the *Guidelines*.
- Digital work maps will comply with the requirements outlined in Volume 1, Section 1.4, of the *Guidelines*. The map files will be will also comply with one of the optional formats of the Digital Flood Insurance Rate Map (DFIRM) database structure as found in Appendix in Appendix L and M of the *Guidelines*.
- Metadata files describing the DFIRM data will include a description of the horizontal and vertical accuracy of the DFIRM base map and floodplain information, and shall include all required information shown in the examples in FEMA's DFIRM Specifications (Appendix L of the *Guidelines*).

- Automated data processing and modeling algorithms for GIS-based modeling and mapping will be documented and provided to FEMA to ensure that they are consistent with the standards outlined above. Digital data sets (such as elevation, basin, or land use data) will be documented and provided to FEMA for approval prior to performing the analysis to ensure that they meet minimum requirements. If non-commercial (i.e., custom developed) software is used for the analysis, then full user documentation, technical algorithm documentation, and the software will be provided to FEMA for review prior to performing the scope of work.

5. Products: All supporting documentation for the activities in this Mapping Activity Statement shall be submitted in a Technical Support Data Notebook (TSDN) format in accordance with Appendix M of the *Guidelines*. These include:

- Digital profiles of the 10%, 2%, 1%, and 0.2% annual chance water-surface elevations, representing existing conditions;
- Flood Insurance Study (FIS) report;
- Floodway data tables;
- Digital copies of all hydrologic and hydraulic modeling (input and output files);
- All back-up data used in hydrologic and hydraulic modeling, including calibration runs and related coordination memoranda or correspondence; and
- Digital work maps files, inclusive of metadata; showing 1% and 0.2% annual chance floodplain boundary delineations, regulatory floodway boundary delineations, cross sections, BFEs, zone designation labels and all applicable base map features; and
- QA/QC reports, to include actions taken during base map preparation, survey acquisition and the preparation of digital work map files.

For GIS-based modeling and mapping, Washington County will deliver all digital input and output data, intermediate data processing products, GIS data layers, and final products in the format of the Digital Flood Insurance Rate Map (DFIRM) database structure.

6. Schedule and Milestones:

Milestone 1, Scoping Phase for Objective 1.1 This milestone includes execution of contracts with appropriate watershed districts as required to meet Objective 1.1. Also, tentative cross-section locations will be selected, with proposed locations depicted on a topographic base map for planning. The target date for Milestone 1 is December 15, 2003.

Milestone 2, Draft Submittal of Objective 1.2 Products for FEMA Review Draft products associated with the delineation of Washington County Non-priority Basins shall be completed and submitted to the FEMA Project Officer for review. It is anticipated that an independent QA/QA report will be run and provided back to Washington County for comment and action. The target date for Milestone 2 is April 1, 2004.

Milestone 3, Hydrology Phase for Objective 1.1 This milestone includes gathering the completed hydrologic analyses from the contracted watershed districts and packaging the data for submittal to the Hydrologic Review Committee for review and concurrence. Products for this milestone include draft hydrologic analyses in accepted TSDN format. The target date for Milestone 3 is April 1, 2004.

Milestone 4, Hydraulics Phase for Objective 1.1 This milestone consists of the completion of hydraulic analyses. Products for this milestone include the completed hydraulic modeling and sample floodplain mapping in accordance with TSDN format. The target date for Milestone 4 is July 1, 2004.

Milestone 5, Final Deliverables This milestone represents completion of the floodplain mapping, generation of flood profiles, compilation of the FIS report, and completion of the TSDN. The final deliverable will be the completed TSDN and accompanying data. A QA/QC report documenting the results of the independent review of all computational and data processing procedures were independently reviewed must also be submitted. Final deliverables will be submitted to the FEMA Project Officer no later than September 15, 2004.

7. **Certifications:** The following certifications apply to this Task Agreement (as appropriate):
- Hydrologic and/or hydraulic analyses and data must be certified by a registered professional engineer or licensed land surveyor in accordance with 44 CFR 65.5(a)(6).
 - Topographic information must be certified by a registered professional engineer or licensed land surveyor in accordance with 44 CFR 65.5(c).
 - Written certification shall be provided that the Washington County base map data meets the minimum standards and specifications outlined in Section 4 above.
 - If fill is to be considered in the mapping to raise land areas above the 1% annual chance flood elevation, certification of the fill must be provided in accordance with 44 CFR 65.5(a)(6) by the community's NFIP permit official, a registered professional engineer, or a licensed land surveyor.
 - Any levee systems to be accredited as discussed in Section 4 of this Mapping Activity Statement must be certified in accordance with 44 CFR 65.10(e).
8. **Technical Assistance and Resources:** Washington County may obtain copies of effective FIS hydraulic modes, FEMA-issued Letters of Map Change (LOMCs), and archived engineering back-up data from FEMA's Mapping Coordination Contractor (MCC). The MCC may be contacted at 1-877 FEMA MAP (1-877-336-2627). Specific technical and programmatic support may be provided through FEMA's MCC; such assistance should be requested through the FEMA MCC Project Officer specified in Section 12 of this Mapping Activity Statement.

Washington County may also consult with the FEMA Project Officer to request support in the areas of: recommended data sources, recommended digital data

accuracy standards, assessing vertical data accuracy, data collection methods or sub-contractors, GIS-based engineering and modeling training.

9. **Contractors:** Procurement of subcontractors using Federal funds provided as part of this Mapping Activity will comply with the requirements of 44 CRF 13.36.

10. **Quality Assurance/Quality Control (QA/QC) Procedures:** Washington County will undertake internal QC reviews to ensure that all work conforms standards outlined in Section 4 of this Mapping Activity Statement. Overall QA/QC of data acquisition and map/data base compilation will be Washington County's responsibility. However, FEMA anticipates the conduct of an independent QA/QC process for review of the DFIRM work map data at specific milestones.

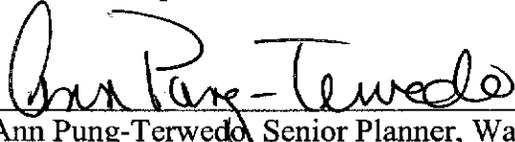
The Minnesota DNR will assist in the review of hydrologic and hydraulic analyses. In addition, the Washington County Water Consortium will provide a peer review of methodologies and data used in the analyses.

For GIS-based, automated modeling, QA/QC activities should ensure automated calculations are reasonable and in compliance with standard flood modeling and mapping approaches. Washington County will document internal QA/QC procedures to ensure all calculations and data processing were reviewed.

11. **Reporting:** Washington County will report progress to the Minnesota DNR and FEMA on a regular basis. Reporting requirements related to the anticipated FEMA funding shall be providing in accordance with Articles of Agreement signed for the Cooperative Agreement grant.

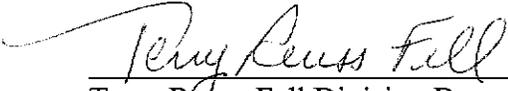
12. **Points of Contact:** Washington County's CTP Project Manager is Ann Pung-Terwedo, Senior Planner, or subsequent personnel appointed to fulfill this responsibility. The FEMA contacts are: Ken Hinterlong, Project Officer, and Lee Traeger, Technical Monitor. It is anticipated that Suzanne Jiwani will represent the Minnesota DNR.

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



Ann Pung-Terwedo, Senior Planner, Washington County

9/24/03
date



Terry Reuss Fell Division Branch Chief
Hazard and Risk Assessment Branch, Region 5
Federal Emergency Management

9-18-03
date