MT-2 Workshop: From a Reviewers Standpoint

September 4, 2018

Floodplain Management Association (FMA) Conference 2018
Agenda

1. Introductions
2. Overview of MT-2s and submittal requirements
   • LOMR vs CLOMR
   • Fee and data requirements
   • MT-2 review process overview
   • MT-2 forms
   • Topographic work map requirements
3. 2D Modeling and Mapping
4. Best Practices
5. FEMA Regulations and Policy
6. Other/Special Topics
7. Exercises and Scenarios
1. Introductions
Introductions

Daven Patel, P.E., CFM
STARR II MT-2 Program Manager
Atkins

Tom Schweitzer, P.E., CFM, PMP, GISP
STARR II Mapping Program Manager
Atkins

Alex Haptemariam, P.E., CFM
STARR II MT-2 Process Manager (FEMA Regions 2, 5, 7, and 10)
Stantec
2. Overview of MT-2s and submittal requirements
What is a MT-2

• Map changes that can be more complex.
• Not usually lot or structure specific.
• Typically involve H&H analysis
• Basis of revision include:
  • More detailed analyses
  • Projects
  • Natural Changes
  • Updates or corrections
What is a LOMR

- A LOMR is an official FEMA letter revising the effective NFIP map(s) for a community. A LOMR may involve changes to the BFEs, SFHA boundaries, or floodway boundaries.

- A portion of the FIRM, revised to reflect the LOMR, is included as part of the LOMR.

- Portions of the FIS, such as the Floodway Data Table, Profile, or Summary of Discharges, may be included and are also revised to reflect the LOMR.

- The FIRM and FIS are NOT reprinted to reflect the LOMR.
When is a LOMR Required

- When a community’s BFEs increase or decrease as a result of physical changes affecting floodplain, community must notify FEMA by submitting data within 6 months.
  - Changes to Base Flood Elevations (BFEs)
  - Correction of map errors
  - Changed physical conditions
  - Incorporating improved topography
  - Incorporating improved H&H
  - Incorporating improved methodologies
BFE Increases in a LOMR

• FEMA permitted LOMR increases in BFEs due to project:
  • On Flooding Sources Without a Floodway
    • Allowable increase is 1.0 foot (without a prior CLOMR)
  • On Flooding Sources With a Floodway
    • Allowable increase is 0.00 foot (without a prior CLOMR)
  • State or Local standards may be more stringent

• For any increases in BFEs (and/or SFHAs), requirements include Property Owner Notification
What is a CLOMR

• A community, or an individual through a community, may request FEMA’s comments on whether the proposed project will justify a map revision, if built as proposed.

• Purpose:
  • Formal comment on proposed projects
  • Not a permit
When is a CLOMR Required?

• A State or Community may require a CLOMR even when FEMA does not.

• When FEMA requires a CLOMR:
  • A1-A30, AE, AO, or AH Zones with **NO** floodway designated, where the project is in the SFHA. CLOMR required if the project increases BFE >1 ft
  • A1-A30 or AE Zones **with** Floodway designated **where the project is in the Floodway**. CLOMR Required if project causes any increase in BFE.
Fee Requirements

• The MT-2 varies depending on the type of submittal

• The FEMA website is the best resource for the fee schedule
  • [https://www.fema.gov/flood-map-related-fees](https://www.fema.gov/flood-map-related-fees)
## MT-2 Fees – CLOMRs and LOMRs

<table>
<thead>
<tr>
<th>Requests for Map Changes Requiring Special Technical Review</th>
<th>Paper Form Fee</th>
<th>Online LOMC Fee</th>
</tr>
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<tbody>
<tr>
<td>CLOMR Based on New Hydrology, Bridge, Culvert, Channel or Combination Thereof</td>
<td>$6,750</td>
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<tr>
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# MT-2 Fees – PMRs (“PMR now”)

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Fee Exemptions

- Processing fees are not required for the following types of projects
  - Map changes based on mapping or study analysis errors
  - Map changes based on the effects of natural changes within the Special Flood Hazard Area (SFHA)
  - Federally sponsored flood-control projects where 50 percent or more of the project's costs are federally funded
  - Map changes based on detailed hydrologic and hydraulic studies conducted by federal, state or local agencies to replace approximate studies conducted by FEMA and shown on the effective Flood Insurance Rate Map (FIRM)
Fee Exemptions

- Processing fees are not required for the following types of projects
  - Map changes based on flood hazard information meant to improve upon that shown on the flood map or within the flood study. *NOTE: Improvements to flood maps or studies that partially or wholly incorporate manmade modifications within the SFHA will not be exempt from fees.*
  - In accordance with the Homeowner Flood Insurance Affordability Act of 2014 (Public Law 113-89, section 22), a requester shall be exempt from submitting a review or processing fee for a request for a Flood Insurance Rate Map (FIRM) change based on a project where: (1) the primary purpose is habitat restoration; and (2) where the project is funded in whole or in part with Federal or State funds.
General Data Requirements

• From §65.6a of regulations
• Requests for changes to effective maps, except for those initiated by FEMA, must be initiated by community’s CEO or designee
  • FEMA can review the MT-2 without community concurrence if appropriate.
• All supporting data, forms, and fees
• State concurrence where required
• Supporting data may include new H&H analysis and delineation of new floodplain boundaries and floodways.
• Unless not appropriate, revised and unrevised WSELs must match within ½ foot at transitions.
General Data Requirements

- No LOMRs can be issued based on proposed conditions
- Datum used for elevations in submission must be provided
- When using gage data, no changes may be made for use of alternate discharges unless changes are statistically significant.
- Must use FEMA-accepted computer models
- Must analyze all recurrence intervals in effective FIS. This includes the floodway.
General Data Requirements

- Hydraulic analysis must be done with the same model used to develop effective BFEs, unless
  - Basis of request is alternative hydraulic methodology;
  - Original modeling is unavailable.

- For a flooding source without BFEs, the analysis may be done for only the 100-year flood

- Revisions based on topographic changes must demonstrate that topographic changes have not resulted in floodway encroachment.
General Data Requirements

- Delineations of floodplain boundaries for flooding sources with established BFEs must analyze 100-year and 500-year floods. For a flooding source without BFEs, the analysis may be done for only the 100-year flood.

- Maintenance program may be required if basis of changes is channel or structure alterations.

- Topographic work map for area to be revised.

- All submitted data must be certified by P.E. as appropriate.
Other possible LOMR requirements

- Data identifying mathematical errors
- Data identifying measurement errors & providing correct measurements
- Description of changes
- Construction plans for as-built conditions
- New hydrologic analysis accounting for effects of changes
- New hydraulic analysis & profiles using the new discharges
- Revised delineation of floodplain & floodway
- New topographic information
- Revised delineation of floodplain & floodway
- Documentation of the source of the data
Data Requirements for Floodway Revisions

- From §65.7 of regulations
- Public notice stating intent to revise floodway.
- Copy of State notification and State approval of revised floodway, where appropriate
- Engineering analysis must use hydraulic model used to determine proposed BFEs.
- Floodway limits set so effective BFEs not increased by more than 1.0 foot
- Revised floodway must be delineated on same topographic map used for revised floodplain boundary.
LOMR and CLOMR General Rules

• If an official no-rise determination is made before hand, a CLOMR is not required by FEMA
  • FEMA is relying on the community to determine if the no-rise determination is accurate and appropriate.

• A LOMR is required when a BFE or map changes, or the hydraulic regime changes
LOMR Review Process Overview

Requestor submits to the LOMC Clearinghouse

Data received by the LOMC Clearinghouse and logged into the MIP

Case assigned to a PTS Contractor

Case push to a LOMR reviewer with the PTS contractor

Requestor has 90 days to respond to AD Letter (Otherwise case is Dropped)

LOMR case reviewer performs a review of the submitted data for completeness

Review of required fee based on the LOMC case type

Reviewer prepares and sends Additional Data (AD) letter to the requestor

Data missing

Additional AD Letter needed

All required case data is received

Minor issues resolved

And case is finalized

Technical data approved and accepted

Note that for each review cycle FEMA is allowed 90 days to review submitted data and prepare the final determination

Data received by the LOMC Clearinghouse and logged into the MIP

Case assigned to a PTS Contractor

LOMR case reviewer performs a detailed technical review of the submitted data

LOMR case reviewer coordinates directly with requestor on technical issues

Technical data approved and accepted

Requestor submits to the LOMC Clearinghouse

Data received by the LOMC Clearinghouse and logged into the MIP

Case assigned to a PTS Contractor

Case push to a LOMR reviewer with the PTS contractor

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LEADERSHIP INNOVATION PARTNERSHIP EFFICIENCY RESILIENCE
LOMR Review Process Overview

- Final Determination letter and map attachment is prepared
- FEMA Docket Approved
- Distribute Final Determination
  - LOMRS
  - CLOMRs
  - PMRs
- 2 Newspaper notices published
- Start 90 day appeal period
- LOMR is effective 120 days after the second newspaper notice (if no appeals)
- Distribute Final BFE Notice Federal Register Published
- Appeal received and accepted
- Special correspondence distributed
- Appeal processing varies in time required
- Appeal is reviewed and determined to be not valid
- Valid
- Appeal
- Case suspended
MT-2 Pre-Review Checklists

<table>
<thead>
<tr>
<th>MT-2 Pre-Acceptance Checklist</th>
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<tbody>
<tr>
<td><strong>Case Number:</strong></td>
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<tr>
<td><strong>Project Identifier:</strong></td>
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<tr>
<td><strong>Community Name:</strong></td>
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<td><strong>Flood Source:</strong></td>
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<td><strong>Case Reviewer:</strong></td>
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<td><strong>Follow-up CLOMR (Y/N):</strong></td>
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<tr>
<td><strong>CLOMR Case Number:</strong></td>
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<thead>
<tr>
<th>Item</th>
<th>Required (%)</th>
<th>Received (%)</th>
<th>Comments</th>
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<tr>
<td>Fee</td>
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<td>MT-2 Favor</td>
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<td>Community Concurrence</td>
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<td>PE Certification</td>
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<tr>
<td>Topographic Work Map</td>
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<tr>
<td>Annotated FIRM</td>
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<td>Duplicate Effective Model(s)</td>
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<td>Hydrologic Models</td>
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<td>Hydraulic Models</td>
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<td>State Applicability</td>
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<td>Aedes Aegypti</td>
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<tr>
<td>95.12 Form (CLOMR Only)</td>
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<td>Property Owner Notification</td>
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<tr>
<td>Public Notice For Floodway</td>
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<tr>
<td>ESA Documentation CLOMR Only</td>
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<th>Checklists (Y/N)</th>
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<tr>
<td>Service Area Affected by Other MT-2 or Study?</td>
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<td>Vertical Affected Communities or community boundaries are correct?</td>
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**PART A: GENERAL REQUIREMENTS**

<table>
<thead>
<tr>
<th>Elements</th>
<th>Yes</th>
<th>No</th>
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<tr>
<td>NARRATIVE: Please provide a written description about the purpose of the request and the scope of the proposed or built project and the methodology used to analyze the project's impact.</td>
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<tr>
<td>MIT-2 APPLICATION FORM(S): Please provide completed forms applicable to your request. Ensure that MIT-2 Form 1 was copied by the requestor, certifying engineer, and each community affected by the revision.</td>
<td></td>
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</tr>
<tr>
<td>HYDROLOGIC ANALYSIS: If applicable, please provide a FEMA acceptable hydraulic analysis in digital format, showing floodplain and associated backup information (e.g., calculation results used in determining the assumed 1% annual exceedance floodplain), and regulatory floodway and how it extends into the boundary delineation shown on the effective FIRM at the downstream and upstream ends of the revised reach.</td>
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<td>HYDRAULIC ANALYSIS: Please provide a FEMA acceptable hydraulic analysis in digital format. FEMA acceptable models can be accessed at <a href="http://www.fema.gov/national-flood-insurance-program-flood-hazard-applications/technical-modeling-guidance">www.fema.gov/national-flood-insurance-program-flood-hazard-applications/technical-modeling-guidance</a>.</td>
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<td>CERTIFIED TOPOGRAPHIC WORK MAP: Please provide a certified topographic work map that meets the mapping requirements outlined in MIT-2 Form 2. If available, please provide digital Computer-Aided Design (CAD) or Geographic Information System (GIS) data that is spatially referenced.</td>
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<td>ANNOTATED FIRM: Please submit a revised FIRM, at the scale of the effective FIRM, which shows the revised boundary delineation of the base floodplain, 0.2 percent annual chance floodplain, and regulatory floodway and how it extends into the boundary delineation shown on the effective FIRM at the downstream and upstream ends of the revised reach.</td>
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<tr>
<td>REVIEW FEE PAYMENT: Please include the appropriate review fee payment. The current fee schedule is available on the FEMA Web site at <a href="https://www.fema.gov/floodplainfeechart">https://www.fema.gov/floodplainfeechart</a>.</td>
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**PART B: CLOMR SPECIFIC REQUIREMENTS**

| Endangered Species Act Compliance: Please submit documentation of compliance with the ESA Requirements. To learn more about ESA Compliance, please see the MT-2 Instructions manual. |

**REGULATORY REQUIREMENTS:** If the Base (1% Annual Chance) Flood Elevation (BFE) increases greater than 0.0 feet as a result of an encroachment within a floodway or 1.0 foot within Zone A, then the Base Flood Elevation (BFE) must be adjusted. Certification and documentation of individual legal notices issued to all affected property owners, as required by the Federal Regulation, Subpart 65.70(b)(3).
MT-2 Case Status Check

How Do I Check the Status of My LOMR Application?

• If you submitted a LOMC application through Online LOMC, you may check the status of your application by logging into your Online LOMC account. The application status is listed on the homepage after you log in. For more information, view the application status definitions.

• If you submitted a request for a LOMR through the mail using the paper MT-2 application process, visit the Status of Map Change Requests webpage for more information.
MT-2 Assistance

How to Obtain Additional Assistance

• If you have any difficulty locating information regarding a map change in which you are interested, please refer to the FEMA Map Information eXchange (FMIX) homepage for additional assistance.

• To assure you receive the information you require in a timely manner, you should first collect the following information prior to contacting the FMIX:
  • Name(s) of the community(ies) affected by the map change;
  • Name of the county(ies) in which the communities are located; and
  • Type of map change request
MT-2 Forms

• Payment Form
• Form 1 – Overview and Concurrence
• Form 2 – Riverine Hydrology & Hydraulics
• Form 3 – Riverine Structures
• Form 4 – Coastal Analyses
• Form 5 – Coastal Structures
• Form 6 – Alluvial Fan Flooding
MT-2 Forms - Common Problems

• Forms not submitted
• Forms not fully completed
• Incorrect fee submitted or fee not submitted at all
• Instructions are not reviewed or followed
• Outdated form versions used. Please use latest forms from https://www.fema.gov/media-library/assets/documents/1343
MT-2 Forms - Common Problems

- Payment Form
  - Submitted to wrong address
  - Engineer will submit the MT-2 data but the requestor submits the payment
  - Please make a copy of the check and include the copy with the technical data
  - Reference the project ID
    - Make it easy and use the same project ID on the report cover
# MT-2 Forms

**PART A: GENERAL REQUIREMENTS**

<table>
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<th>ELEMENTS</th>
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<td><strong>HYDROLOGIC ANALYSIS</strong>: If applicable, please provide a FEMA acceptable hydrologic analysis in digital format. Drainage area map and associated backup information (e.g., calculations used to determine log time, CN and loss values as well as landuse and soil maps). FEMA acceptable models can be accessed at <a href="http://www.fema.gov/national-flood-insurance-program/flood-hazard-mapping/numerical-models/meeting-minimum-requirements">www.fema.gov/national-flood-insurance-program/flood-hazard-mapping/numerical-models/meeting-minimum-requirements</a>.</td>
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<td><strong>MET 65.16 REQUIREMENT</strong>: If the request intends to show that a bern levee flood wall provides flood protection, please submit all of the data requirements outlined in Section 65.16 of the NFIP regulations.</td>
<td></td>
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<tr>
<td><strong>OPERATION AND MAINTENANCE PLAN</strong>: If the request involves a bern, levee, flood wall, dam, and/or detention basin project, please submit an officially adopted maintenance and operation plan.</td>
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<td><strong>PROPOSED AS-BUILT PLANS</strong>: If applicable, please submit proposed as-built plans, certified by a registered Professional Engineer, for all the project elements.</td>
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<td><strong>FLOODWAY NOTICE</strong>: If the revision result in changing or establishing floodway boundaries, please provide floodway public notice or a statement by your community that it has notified all affected property owners, in compliance with NFIP regulation Subparagraph 65.16(b)(1).</td>
<td></td>
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<tr>
<td><strong>PROPERTY OWNER NOTIFICATION</strong>: If the revision result in any widening/shifting-establishing of the base floodplain and/or any BFE increases establishing BFEs, please provide copy of the individual legal notices sent to all the property owners affected by any increases in the flood hazard information.</td>
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MT-2 Forms

• Form 1: Overview & Concurrence Form
  • Provides basic information about the case
  • Community needs to provide the community concurrence
    • Districts should not sign the form on behalf of the community
    • At a minimum documentation should be provided demonstrating that the community has had an opportunity to review the submittal
  • The community official and professional engineer are both signing statements that provide FEMA with assurances
MT-2 Forms

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: ______________________
Community Name: ______________________
Mailing Address: ______________________
Daytime Telephone No.: ______________________
Fax No.: ______________________
E-Mail Address: ______________________
Community Official's Signature (required): ______________________
Date: ______________________

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: ______________________
License No.: ______________________
Expiration Date: ______________________
Company Name: ______________________
Telephone No.: ______________________
Fax No.: ______________________
Signature: ______________________
Date: ______________________
E-Mail Address: ______________________
MT-2 Forms - Common Problems

• Form 1: Overview & Concurrence Form
  • All signatures are not received
  • Other affected communities have not concurred
  • Not all map panels affected listed
  • Data not certified by P.E. or L.S.
MT-2 Forms

• Form 2: Riverine Hydrology & Hydraulics Form
  • Summarizes the H&H changes in the submittal

• This form will be used to confirm which models or model plans are to be used for the review.

• Identifies the tie-in locations/cross sections.
MT-2 Forms - Common Problems

- Form 2: Riverine Hydrology & Hydraulics Form
  - Explanation for new hydrologic method not submitted
  - Computer model not approved by FEMA
  - Where State must approve new discharges, approval not obtained
  - Alternate method submitted, but no improvement from old method
    - Discharges need to be statistically different
      - “Maps will not be revised when discharges change as a result of the use of an alternative methodology or data for computing flood discharges unless the change is statistically significant as measured by a confidence limits analysis of the new discharge estimates.”
MT-2 Forms - Common Problems

- Form 2: Riverine Hydrology & Hydraulics Form
  - Wrong regression equations used or regression equations used when not appropriate
  - Model not calibrated where calibration required
  - All FIS recurrence intervals not analyzed
MT-2 Forms - Common Problems

- Form 2: Riverine Hydrology & Hydraulics Form (continued)
  - Duplicate, Corrected, Pre-Project, or Post-Project models not submitted or inconsistent
  - All FIS recurrence intervals not analyzed
  - Revised analysis does not tie in upstream or downstream

---

3. Pre-Submittal Review of Hydraulic Models*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4. Models Submitted

<table>
<thead>
<tr>
<th>Models Submitted</th>
<th>Natural Run</th>
<th>Floodway Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duplicate Effective Model*</td>
<td>File Name:</td>
<td>Plan Name:</td>
</tr>
<tr>
<td>Corrected Effective Model*</td>
<td>File Name:</td>
<td>Plan Name:</td>
</tr>
<tr>
<td>Existing or Pre-Project Conditions Model</td>
<td>File Name:</td>
<td>Plan Name:</td>
</tr>
<tr>
<td>Revised or Post-Project Conditions Model</td>
<td>File Name:</td>
<td>Plan Name:</td>
</tr>
<tr>
<td>Other - (attach description)</td>
<td>File Name:</td>
<td>Plan Name:</td>
</tr>
</tbody>
</table>

* For details, refer to the corresponding section of the instructions.
MT-2 Forms - Common Problems

- Form 2: Riverine Hydrology & Hydraulics Form (continued)
  - Topographic work map with contours not submitted
  - Revised boundaries do not tie into effective floodplain/floodway boundaries

A certified topographic work map must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1% and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester’s property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: ____________________________

Source: ______________ Date: ______________

Accuracy: ________________________________

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must be in with the effective floodplain and regulatory floodway boundaries. Please attach a copy of the effective FIRM and/or FBFM, at the same scale as the original, annotated to show the boundaries of the revised 1%-and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%-and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area on revision.

Annotated FIRM and/or FBFM (Required)
MT-2 Forms – Common Problems

• Form 3: Riverine Structures Form
  • Channels, Bridges/Culverts, and Basins Sections
    • Adequate channel description not provided
    • Adequate channel lining not provided
    • Hydraulic jump not checked
    • Form not submitted for each new or altered bridge or culvert
    • Inadequate data on structure provided
    • Wrong method used to model structure (e.g. Special Bridge, Normal Bridge)
MT-2 Forms – Common Problems

• Form 3: Riverine Structures Form (continued)
  • Levee Section
    • Adequate freeboard information not submitted
    • Geotechnical information not submitted
    • O&M plan not submitted
    • Interior drainage plan not submitted

➢ Completion of the MT-2 form is your levee certification
MT-2 Forms – Common Problems

- Form 6: Alluvial Fan Flooding Form
  - Form not filled out completely
  - Follow the FEMA alluvial fan guidance and stage analysis
  - Coordinate with the region before completing a new analysis
    - Updating an existing analysis using the same methodology does not need coordination

| 56 | 7/31/2013 | Implemented with all new flood risk projects initiated in FY13. | Alluvial Fan | Program Standard | Written approval from the FEMA Regional Risk Analysis Branch Chief regarding the alluvial fan methodology must be obtained before the commencement of full analysis. To inform this decision, sufficient field data and analysis and records of community engagement relative to the scope and methodology must be provided. |
MT-2 Forms – Updated Forms

• Coming soon
  • New MT-2 forms and instructions
  • Includes additional guidance on levees
    • O&M requirements
    • Emergency Preparedness Plan (EPP) requirements for levee submittals
    • Clarifies CLOMR levee requirements
  • Clarifies notification requirements for CLOMRs
  • Clarifies community official signature responsibilities
Topographic Work Map

- A topographic work map must be submitted showing the following information:
  - Effective 100-year floodplain and floodway boundaries from FIRM/FBFM
  - Revised 100- and 500-year floodplain boundaries or revised 100-year floodplain boundaries only (Zone A)
  - Revised floodway boundaries
  - Tie-ins between the effective and revised 100-, 500-year and floodway boundaries
Topographic Work Map

- Location and alignment of all model cross sections
- Location of all cross sections used in model should be shown
- Location of cross sections on work maps must agree with cross section locations on FIS profiles, and Floodway Data Table
- Distances between cross sections must agree with corresponding distances on profiles, floodway data, and H&H models within 5% of map scale
- Stream alignments, road alignments and dam alignments.
- Current community boundaries
- Vertical datum (example: NGVD, NAVD)
- The signed certification of a registered professional engineer
Topographic Work Map

- Common problems with work map
  - No contours provided
  - Too few cross sections used or shown
  - No profile baseline, when one is necessary
  - Physical features shown but not modeled (or vice versa)
  - 1% annual chance floodplain is delineated inside floodway
  - Floodplain boundaries not consistent with flood elevation determination
  - Floodplain delineation not in agreement with topography
  - Floodway width not consistent with information shown in model or Floodway Data Table
3. 2D Modeling and Mapping
2D Modeling

- 2D modeling is becoming more prevalent
- Need to be cautious when using 2D models in areas with established Zone AE floodplains and/or floodway
  - Need to demonstrate that the 2D modeling is more appropriate (there is high standard that needs to be met)
  - CFR 44 65.6 (a)(8)

(8) A revised hydraulic analysis for a flooding source with established base flood elevations must include evaluation of the same recurrence interval(s) studied in the effective FIS, such as the 10-, 50-, 100-, and 300-year flood elevations, and of the floodway. Unless the basis of the request is the use of an alternative hydraulic methodology or the requestor can demonstrate that the data of the original hydraulic computer model is unavailable or its use is inappropriate, the analysis shall be made using the same hydraulic computer model used to develop the base flood elevations shown on the effective Flood Insurance Rate Map and updated to show present conditions in the flood plain. Copies of the input and output data from the original and revised hydraulic analyses shall be submitted.
2D Modeling Submittals

• If 2D modeling results are going to be included as a Zone AE flood zone, then you need to submit profile information
  • Profile baseline
  • Ground and BFE information that follows the profile baseline

• If the flooding is less than 3 feet in depth, Zone AH may be a more desirable flood zone
2D Modeling and Floodways

• There is currently no FEMA approved guidance on modeling floodways using a 2D model

• So the current options for revising an effective floodway with a 2D model are:
  • Create a 1D calibrated model and complete a floodway analysis using the 1D model using equal conveyance reduction
  • Map an administrative floodway (no floodway modeling completed)
  • Map the floodway as coincident with the floodplain (no floodway modeling completed)
2D Modeling and Floodways

- Current floodway guidance will refer you to FEMA to evaluate options on a case by case basis.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>Floodway</th>
<th>Working Standard</th>
<th>An equal conveyance reduction method must be used to establish the minimal regulatory floodway.</th>
</tr>
</thead>
<tbody>
<tr>
<td>73</td>
<td>11/1/2009</td>
<td>Existing standard. Already implemented.</td>
<td>Floodway</td>
<td>Working Standard</td>
<td>To calculate floodways using methodologies other than steady-state, one-dimensional models, pre-approval must be received from the FEMA Project Officer and impacted communities and states with floodway authorities.</td>
</tr>
</tbody>
</table>
2D Modeling and Regulatory BFE Increases

- Current guidance is evolving

- BFE increases for 2D models should be determined on a cell by cell basis
  - Definition within the CFR does not differentiate between 1D and 2D
2D Mapping of Shallow Areas

- Sometimes the fringes of a floodplain from a 2D model are less than a foot in depth
  - These areas should continue to be mapped as a Zone AE if the remaining area is Zone AE
  - Conversion to a Zone X (shaded) flood zone is not appropriate unless the model area is shallow flooding (i.e. Zone AO flood zones)
4. Best Practices
Best Practices

• General
  • Understand the NFIP regulations and policies as much as possible
  • Start the process early
  • Identify potential coordination issues between agencies
  • Use proper and latest MT-1 or MT-2 forms
  • Follow directions and templates of MT-1 or MT-2 forms
    • Such as notification letters and public notices
Best Practices

- Technical report.
  - Provide a narrative
  - Provide adequate and proper scale maps
  - Organize the report logically
  - Tell and show FEMA exactly what you want to get from this submission
  - Include any GIS or CAD data
- If a paper submittal is sent to the LOMC Clearinghouse, make sure to also include a organized digital version of the report
  - Paper submissions are scanned by the LOMC Clearinghouse to a single or a just a few PDFs that are not indexed!
Best Practices

- Example of well organized digital submission

- Attachment 1 - Vicinity Maps
- Attachment 2 - FEMA FIRM Maps
- Attachment 3 - 1990 Simi Valley MPD - Email - Hydrology Map
- Attachment 4 - Flood Overview Map
- Attachment 5 - FEMA Comment Response Matrix and Model Updates
- Attachment 6 - CEQA & ESA Compliance Material
- Attachment 7 - FEMA TUFLOW Certification
- Attachment 8 - Topo Comparison
- Attachment 9 - VC Rat Models & Hydrographs
- Attachment 10 - Reference Storm Drain As-Built Plans
- Attachment 11 - HEC-RAS Data
- Attachment 12 - 2010 Ventura County Hydrology Manual Soils Map
- Attachment 13 - Previous Hydrologic & Hydraulic Studies
- Attachment 14 - City Correspondence Regarding LiDAR NOAA14
- Attachment 15 - TUFLOW Model Layer Index
- Attachment 16 - TUFLOW Model Calibration
- Attachment 17 - TUFLOW - Flooding Maps
- Attachment 18 - Proposed Condition Site Plans
- Attachment 19 - TUFLOW Model
- Attachment 20 - Manholes Modeling
- Attachment 21 - Bridge Modeling
- Attachment 22 - 1D-3D Pipe Length Error Analysis
- Attachment 23 - Correspondence for NOAA Atlas 14 and VC Rat Updates
- Grading Certifications
- MIT-2 Forms
Best Practices

• Extend models far enough to transition to the unrevised data.
  • Understand the difference between your project area vs the revision area.

• Perform a quality check before submitting data. Insure data consistency.

• Use CHECK-RAS programs from FEMA web site.
  • Might encounter some difficulty running in Windows 10

• If applicable, coordinate with the state or district PRIOR to submitting to FEMA.
Best Practices

- Ask about other LOMRs that may affect your site.
- Follow the guidelines in the MT-2 forms for what should be in duplicate effective, corrected effective, existing, and proposed conditions models.
- Notify ALL affected property owners in writing. Send copies of letters to FEMA with submission.
- Notify adjacent affected communities and obtain concurrence.
Best Practices

• Don’t forget operations and maintenance agreements

• Eliminate negative surcharges

• Remember that FEMA looks at the internal consistency of the submission quite heavily. Does the work map match the model, the profile, and the new floodway data table explicitly? If not, then expect concerns to be raised.

  ➢ Model and mapping agreement needs to be within 5% of the FIRM scale or 5% of the model value (whatever is greater).
Best Practices

- For levee certifications consider organizing the certification material by CFR requirement.

- (b)(1) freeboard
- (b)(2) closures
- (b)(3) embankment protection
- (b)(4) embankment foundational stability
- (b)(5) settlement
- (b)(6) int_drainage
- (b)(7) other
- (c)(1) op_plans_closures
- (c)(2) op_plans_int_drainage_sys
- (c)(3) op_plans_other
- (d) maintenance
- (e) certification
5. FEMA Regulations and Policy
FEMA Regulations and Policy

• Notification requirements for floodway, BFE, and/or SFHA increases
  • Compared against effective FEMA FIS and FIRM.
  • The notifications requirements for CLOMRs and LOMRs are now the same.
• Floodway revisions (CFR 65.7)
  • The community has to publish a public notice or provide a statement that all property owners affected by the floodway revision have been notified.
  
  ➢ The community has to provide final assurance to FEMA that this has been completed. The engineer or requestor cannot state on their own that all property owners have been notified, unless the community confims their statement.
  
  ➢ Individual notification letters can be sent instead of a public notice but the letters must be on community letterhead or the community must make the statement mentioned above.
FEMA Regulations and Policy

• Notification requirements for floodway, BFE, and/or SFHA increases
  • Compared against effective FEMA FIS and FIRM.
  • The notifications requirements for CLOMRs and LOMRs are now the same.
  • BFE notifications
    • If there are BFE increases or newly establish BFEs, then property owner notifications is required for the affected property owners.
      • The letters can be sent by the community on their letterhead, or
      • The letters can be sent by a professional engineer but the community must be copied on the letters, or
      • Notification can occur through a community public notice.
FEMA Regulations and Policy

• Notification requirements for floodway, BFE, and/or SFHA increases
  • Compared against effective FEMA FIS and FIRM.
  • The notifications requirements for CLOMRs and LOMRs are now the same.
• SFHA notifications
  • If there are SFHA increases or newly establish SFHAs, then property owner notifications is required for the affected property owners.
    • The letters can be sent by the community on their letterhead, or
    • The letters can be sent by a professional engineer but the community must be copied on the letters, or
  • Notification can occur through a community public notice.
FEMA Regulations and Policy

- CLOMR projects that would result in a BFE increase greater than allowed require CFR 65.12 compliance.
  - Compared against pre-project conditions modeling.
  - Floodway encroachments cannot result in any BFE increase (measured to hundredth of a foot).
  - Non floodway increases are allowed up to 1 foot.
FEMA Regulations and Policy

- CFR 65.12 requirements.
  - Evaluation of alternatives that would not result in the BFE increases and an explanation of why they are not feasible.
  - Certification that no structures would be impacted by the increases.
  - Property owner notification to the owners affected by the increases.
    - Cannot do this with a public notice.
6. Other/Special Topics
Acceptable Models

- MT-2 submittals need to use FEMA accepted models
- FEMA maintains a list of acceptable models
  - [https://www.fema.gov/numerical-models-meeting-minimum-requirements-national-flood-insurance-program](https://www.fema.gov/numerical-models-meeting-minimum-requirements-national-flood-insurance-program)
  - May not be up to date with the latest accepted models so confirm
- National versus local acceptance
  - [Current Nationally Accepted Hydraulic Models](#)
  - [Current Locally Accepted Hydraulic Models](#)
## Acceptable Models

<table>
<thead>
<tr>
<th>Tool</th>
<th>Contact</th>
<th>Description</th>
</tr>
</thead>
</table>
| FLO-2D Pro      | Jimmy S. O'Brien  | FLO-2D Software, Inc.  
P.O. Box 66  
Nutrioso, AZ 85932  
Please review 'Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix G: Guidance for Alluvial Fan Flooding Analyses and Mapping (Feb 2002)' thoroughly before applying to alluvial fans. Coordination with the Regional Office is required.  
Calibration to actual flood events is required.  
**Only accepted for usage within Mohave County, Pima County, Pinal County, and Maricopa County, Arizona.**  
Public Domain: No |
Acceptable Models

- Must meet the requirements of CFR 65.6 (a)(6)
- February 2018 FEMA guidance document outlines the requirements for local acceptance
- Okay to leverage technical review and documentation submitted by other communities/entities

*(6) Any computer program used to perform hydrologic or hydraulic analyses in support of a flood insurance map revision must meet all of the following criteria:

1. It must have been reviewed and accepted by a governmental agency responsible for the implementation of programs for flood control and/or the regulation of flood plain lands. For computer programs adopted by non-Federal agencies, certification by a responsible agency official must be provided which states that the program has been reviewed, tested, and accepted by that agency for purposes of design of flood control structures or flood plain land use regulation.
2. It must be well-documented including source codes and user’s manuals.
3. It must be available to FEMA and all present and future parties impacted by flood insurance mapping developed or amended through the use of the program. For programs not generally available from a Federal agency, the source code and user’s manuals must be sent to FEMA free of charge, with fully-documented permission from the owner that FEMA may release the code and user’s manuals to such impacted parties.*
Acceptable Models

FEMA does not provide technical review or testing of models. The following section provides guidance on the certification of computer programs for performing coastal, hydrologic, and hydraulic analyses for map revisions and other NFIP purposes.

Hydrologic and hydraulic models developed by Federal agencies responsible for the implementation of flood control programs, floodplain regulation, and/or flood hazard analysis clearly meet the criteria stated in 44 CFR Paragraph 65.6(a)(6)(i) of the NFIP regulations. Models developed by non-Federal agencies or private entities must be certified by a governmental agency responsible for the implementation of programs for flood control and/or regulation of floodplain lands. The certifying agency can be a Federal agency or non-Federal agency, such as a state water conservation board or regional flood control district. If the certifying agency is not a Federal agency, the certifying agency must review, test, and accept the model. The requirements for certification, listed below, are more rigorous than simply applying the model for a given project.
Acceptable Models

- The certifying agency must review the model in sufficient detail to conclude that the model is scientifically correct and technically sound. The model must be based on sound hydrodynamic, hydrologic, or hydraulic principles. For this review, the certifying agency may rely on published technical papers by authors other than the model developers that demonstrate the model is technically sound. FEMA may request the certifying agency to provide the list of reviewed technical references.

- The certifying agency must test the model with measured data or compare the model to other similar models on FEMA’s list of “Numerical Models Meeting the Minimum Requirements” to determine whether the model can adequately reproduce the measured data or provide results comparable to other models accepted by FEMA. A summary of the testing methods and results should be provided to FEMA.

- The certifying agency must accept the model for its use in administering programs for the design of flood control structures and/or the regulation of floodplain lands.

- With the request for approval of the model submitted to FEMA, the certifying agency must cite and describe specific examples of using the model to demonstrate the applicability of the model to the NFIP for purposes of the design of flood control structures and/or the regulation of floodplain lands.

- If necessary, FEMA may request the certifying agency to provide assistance, such as providing answers to technical questions, relative to the use of the certified model for Flood Insurance Studies and appeals in the NFIP.

- The certification must be provided by a responsible agency official who has the authority to certify the model on behalf of the agency.
Acceptable Models

In several previous instances, FEMA has reviewed and tested a proprietary model for possible inclusion in the Accepted Models lists. However, as of August 16, 2004, FEMA does not review and test any proprietary model. Another government agency that is familiar with the model should be contacted to certify its use. FEMA will provide necessary assistance to the certifying agency upon request. The certifying agency must review and test the model to determine whether the model is scientifically correct and technically sound, and whether the model can provide adequate information to support NFIP study and mapping. While Federal agencies can certify a model for nationwide use, State and regional agencies can certify a model for use within their jurisdiction. The certification document must be provided by an agency official with authority to certify the model on behalf of that agency. FEMA will review and evaluate the certification materials provided by the certifying agency to make the final determination on whether the model meets the minimum requirements of the NFIP.
CLOMRs and ESA Compliance

- All individuals in the country (private and public) have a legal responsibility to comply with the ESA. As a result, FEMA requires documentation of ESA compliance for potential projects to be submitted before a CLOMR application will be reviewed.

- Additional Resources
  - ESA Fact Sheet https://www.fema.gov/media-library/assets/documents/116871
CLOMRs and ESA Compliance

- Determine if there is a federal action.
  - Funding
  - Permitting
  - Project manager

- Conservation plan
  - Need to submit a copy of the plan.
  - Documentation of compliance with the plan, such as a fee receipts.
CLOMRs and ESA Compliance

• Some (but not all) FWS field offices will only interact with applicants if there is a federal action. If an applicant goes directly to the Services for concurrence, even though there is no federal action, and gets a “no effect” statement from the Services, the applicant is still required to provide a “no take” statement.

• Sometimes the Services assumes that the applicant is a “federal designee” but just because the applicant is applying for a CLOMR from FEMA does not make the applicant a federal designee.
Questions?

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