

### Issue 65: Incorporating LOMRs in DFIRMs

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#### Background

In 2000, the State of North Carolina entered into a Cooperating Technical State (CTS) partnership agreement with the Federal Emergency Management Agency (FEMA).

In this partnership, the State began the process of updating the Digital Flood Insurance Rate Maps (DFIRMs) and Flood Insurance Study (FIS) Reports for all 100 counties in North Carolina. As part of the agreement, the North Carolina Floodplain Mapping Program (NCFMP) was responsible for releasing and updating any effective DFIRMs and FIS Reports. Effective flood data required common revisions to update flood risk zones and floodplain delineations on the DFIRMs and FIS Reports. These updates were appropriately addressed through a Letter of Map Revision (LOMR) and should have been incorporated into the effective statewide DFIRMs.

FEMA offered the responsibility to the NCFMP to ensure that all effective LOMRs were properly incorporated into the DFIRM panels or superseded by the new data during the statewide mapping and map maintenance initiatives. The scope of study for each flooding source was determined during the initial scoping process.

The statewide mapping program utilizes four methods of study for engineering analysis:

- **New detailed study** involves a new HEC-RAS model calibrated to new topographic data and drainage area analysis. A new detailed study provides base flood elevations (BFEs), surveyed cross sections, and floodways for all identified streams. Detailed field surveys provide cross sections and data for structures such as: dams, bridges, culverts, and levees.
- A **redelineation** process is applied to streams that have a current effective detailed study where the BFEs are still considered accurate. Redelineation projects the effective model onto the new base data so effective BFEs will not change. The shape of the Special Flood Hazard Areas (SHFAs) for redelineated streams are adjusted to match the new topographic data used for the new DFIRMs. Structures are not required to be field surveyed.
- **Limited detailed studies** provide map users BFEs and cross sections for areas that were unstudied or previously Zone A areas. This data is derived from the Light Detection and Ranging (LiDAR) data collected for the base data used on the DFIRMs. Floodways are not mapped, and instead, non-encroachment area widths are listed in the FIS Report and provide local planning officials the ability to regulate changes in the floodplain. Structures are not required to be field surveyed. Profiles are not developed and Floodway Data Tables are replaced in the FIS Report with Limited Detailed Flood Hazard Data Tables.
- **Automated Zone A** analysis is only used in State and Federal National Forests and Parks. The floodplains are generated in the same GIS processes as more detailed methods using the LiDAR based Digital Elevation Models so the boundaries are based on the newest topography available. No BFEs, cross sections, and floodway are mapped for

approximate study streams. Only the 1% annual chance floodplain is shown on the FIRM panels.

### **Issue**

How should effective LOMRs be incorporated into map revisions based on the four methods of study?

### **Recommendations**

Below are the recommendations for incorporating LOMRs into map revisions. For all flood studies, Engineering and Mapping Contractor (EMC) shall provide a memorandum identifying all LOMRs that are incorporated into the study for the pre-preliminary submittal. Specific information must be provided to describe the data incorporated from the LOMR model. The topographic sources must be provided in the memorandum. The TSDN should include a list of topographic sources used in the flood study.

#### New Detailed Studied Streams

The scope of new detailed studied streams combines a new engineering model with new topographic data that is derived from the LIDAR. If an effective LOMR exists for a flooding source scoped for new detailed study, the topographic sources in the LOMR must be researched and the EMC should evaluate the LOMR topographic sources and the LIDAR topographic data to determine which source is more detailed. If the LOMR topographic data is more detailed, it should be used for DFIRM mapping instead of the LIDAR data for the specific reach of stream for which it exists. However, if the LIDAR topographic data is more detailed, the LOMR topographic data should not be used in the mapping. The LOMR modeling must be superseded and the new engineering analysis used for DFIRM mapping.

#### Redelineated Streams

Redelineated streams do not have a new detailed model, but there is an effective model that this still accurate and mapped using the LIDAR topographic data for the new maps. If a LOMR was issued effective after the redelineated model was created for the effective FIS Report, the LOMR model should be incorporated into to new maps. If the LOMR was issued effective before the redelineated model was created for the effective FIS, the LOMR model should be superseded. For LOMRs issued both before and after the effective models were created, the topographic data should be investigated. The EMC should compare the level of detail of the topographic data that was used for the LOMR model and the LIDAR topographic data. The topographic data source that is more detailed should be used for mapping the redelineated elevations on the new DFIRM panels.

#### Limited Detailed Studies

Detailed engineering models are more complex and technically detailed compared to limited detailed engineering models. If a LOMR with a detailed engineering model exists for a stream scoped for limited detailed study, the EMC should change the scope from limited detailed study to redelineation and should incorporate the existing LOMR data into the stream reach for which the data is available. Limited detailed study should not replace existing detailed study.

## North Carolina Cooperating Technical State Floodplain Mapping Program

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If a LOMR with an approximate engineering model exists, the model should be superseded because the limited detailed study model is more detailed.

For both situations, a comparison between the LOMR and LIDAR topographic data should be completed before mapping begins. The topographic data source that is more detailed should be used for DFIRM mapping.

### Automated Zone A

If a LOMR with a detailed engineering model exists for a stream scoped for automated Zone A analysis, the EMC should change the scope from automated Zone A study to redelineation and should incorporate the existing LOMR data into the stream reach for which the data is available. Automated Zone A study should not replace existing detailed study.

If a LOMR with an approximate engineering model exists, the model should be superseded because the new automated Zone A model is more detailed.

For both situations, a comparison between the LOMR and LIDAR topographic data should be completed before mapping begins. The topographic data source that is more detailed should be used for DFIRM mapping.

### **Final Guidelines**

Guidelines follow the procedures discussed in the "Recommendations" section of this issue paper.

### **References**

NCFMP Issue Paper # 23 – Flood Insurance Study and Flood Insurance Rate Map Standards for Limited Detailed Studies

NCFMP Issue Paper # 35 – Automated Zone As

NCFMP Fact Sheet – Limited Detailed Study Methods

### **Points of Contact**

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