The Upper Mississippi River
Rock Island District

USACE Disaster Operations
Public Law 84-99
Preparedness

The Flood Control and Coastal Emergency Act establishes an emergency fund for preparedness for emergency response to natural disasters; for flood fighting and rescue operations; for rehabilitation of flood control and hurricane protection structures. Disaster preparedness activities include coordination, planning, training and conduct of response exercises with local, state and federal agencies.

Funding for USACE emergency response under this authority is provided by Congress through the annual Energy and Water Development Appropriation Act.

Response Activities

PL 84-99 allows the Corps of Engineers to supplement State and local entities in flood fighting urban and other non-agricultural areas under certain conditions.

All flood fight efforts require a Project Cooperation Agreement signed by the Public Sponsor and a requirement for the Sponsor to remove all flood fight material after the flood has receded.

PL 84-99 also authorizes emergency water support and drought assistance in certain situations and allows for “advance measures” assistance to prevent or reduce flood damage conditions of imminent threat of unusual flooding.
Rehabilitation

Under the authority of PL 84-99, an eligible flood protection system can be rehabilitated if damaged by a flood event. The flood system would be restored to its pre-disaster status at no cost to the Federal system owner, and at 20% cost to the eligible non-Federal system owner.

All systems considered eligible for PL 84-99 rehabilitation assistance have to be in the Rehabilitation and Inspection Program prior to the flood event. Acceptable operation and maintenance by the public levee sponsor are verified by levee inspections conducted by the Corps on a regular basis.

USACE conducts 
Two types of levee inspections

Using a Geographic Information Systems (GIS) / Global Positioning System (GPS)-based inspection tool that incorporates a standard levee inspection checklist. Levee sponsors are encouraged to be part of the inspection team.

Routine Inspection
(annually)

Periodic Inspection
(every 5 years)
Data Collection / Field Inspection / Final Report
Inspection Ratings

Both Routine and Periodic Inspections result in a final inspection rating for operation and maintenance. The rating is based on the levee inspection checklist, which includes 125 specific items dealing with operation and maintenance of levee embankments, floodwalls, interior drainage, pump stations, and channels. Each levee segment receives an overall segment inspection rating of Acceptable, Minimally Acceptable, or Unacceptable.

A levee sponsor must maintain the levee to at least the minimally acceptable standard to remain eligible for federal rehabilitation assistance through the USACE Rehabilitation and Inspection Program (PL 84-99).

Muscatine Urban Levee System
Emergency Planning Assistance

US Army Corps of Engineers - Flood Plain Management Services

City of Muscatine Assistance Request FY09

Special Studies Federal Funding FY12 and FY13
Muscatine Urban Levee System
Evaluation of Flooding Scenarios

Engineering Studies /Analyses

► Scope, Stakeholders, Feedback
► Structural / Geotechnical Evaluation
► GIS / LIDAR Data
► Hydraulic Modeling / Mapping
► Report w/ Technical Appendix
System Evaluation

Residual Risk and Public Safety
- Periodic and Annual Inspection Reports
- Emergency Response Plan
- System Capacity Exceedance Provisions
- Critical Levee Failure Locations

Flood Wave Progression

Hydraulic Modeling Products --

Identify threat to human life and safety characterized by flood wave progression and rapid increases in water depths.
City of Muscatine - Muscatine Island
Levee District – Louisa Co. D. D. #13

Federally authorized / Non-federally operated & maintained urban flood protection project, designed to withstand flood flows of a .5% chance flood event.

The flood protection main features are:
- Sand and Earthen levees (approximately 15 miles)
- Floodwalls at upstream railroad closure
- Interior drainage system
- 2 Closure Structures
- 1 Pump Station
- 14 Gatewells

City of Muscatine – Muscatine Island Levee District
Muscatine and Louisa Counties

Mississippi River Mile 455 to 442 -- approximately 15 miles of levee.

The levee system protects approximately 30,000 acres of developed industrial, agricultural, and residential land.
National Levee Database

Rock Island District
Upper Mississippi River

33 Main-stem levee systems
440 miles field surveyed

BUILDING STRONG®
Upper Mississippi River System Flow Frequency Study Area

Upper Mississippi River
815 River Miles

Hydraulic Model
One dimensional HEC-RAS
Basis for FLO2-D

Stakeholder Work Group

Muscatine County Stakeholders
Louisa County Stakeholders
Breach Location

✓ Location population/census data (life/safety)
✓ Critical Infrastructure (Power Plants, etc)
✓ Transportation (Airport, Highways)
✓ Manufacturing Facilities (workforce/equipment)
✓ Hazardous Material (Chemicals, Petroleum)

Breach Characteristics

➢ Location of breach
➢ Depth of breach
➢ Width of breach
➢ Time for breach to fully form
Muscatine Island Urban Levee System Study
Breach Analysis
Muscatine Island Levee, Iowa

Flood Plain Management Services Special Study
Section 206 (PL 86-645) of the 1960 Flood Control Act as Amended

2-Dimensional Hydraulic Modeling Results
Time to Depth Summary
### Time From Breach Initiation to 1 ft Water Depth (Hours)

<table>
<thead>
<tr>
<th>Name</th>
<th>ID</th>
<th>Breach Loc 1</th>
<th>Breach Loc 2</th>
<th>Breach Loc 3</th>
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### Breach Location 1
60 HR
Breach Location 1
Full Depth
Final Width 1763ft

72 HR
Breach Location 1
Full Depth
Final Width 1763ft
Breach Location 2

4 HR

Breach Location 2
Full Depth
Final Width 1588ft
Breach Location 3

4 HR

Breach Location 3
Full Depth
Final Width 1546ft

Legend

- Graded Facility
- Flood Protection Area
- 4 Hour Flow Depth (ft)
- 0 - 3
- 4 - 6
- 7 - 9
- 10 - 12
- 13 - 15
- 16 - 18
- 19 - 21
- 22 - 24
24 HR
Breach Location 3
Full Depth
Final Width 1546ft

32 HR
Breach Location 3
Full Depth
Final Width 1546ft
Conclusions

The study was not initiated because of any known imminent risk of failure to the levee protecting Muscatine Island.

Study deliverables include the analysis of failure scenarios, timing, and inundation mapping to serve as input for stakeholder’s emergency preparedness planning, and selection of evacuation routes and procedures. Tables show time to 1ft and 2ft depth (in hours) for identified critical facilities.

Questions?

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