



## Mitigation Efforts Prove Successful in Flood Fight Along the Red River

### Full Mitigation Best Practice Story

#### *Clay County, Minnesota*

**Moorhead, MN** – Moorhead has seen its share of flooding over the past two decades. In 1994, 1997, and 2002, the City of Moorhead took part in FEMA's Hazard Mitigation Grant Program (HMGP) to mitigate flooding and reduce future flood losses. A total of eight repetitive loss properties in 1994, sixteen homes damaged in the 1997 flood, and two additional repetitive loss homes in 2002 have been acquired through the HMGP.



Following a major disaster declaration, the HMGP funds up to 75 percent of the eligible costs of a project that will reduce or eliminate damages from future natural hazard events. The Minnesota Department of Employment and Economic Development (DEED) and the Department of Natural Resources (DNR) split the cost of the remaining 25% needed for the buyouts.

When Mary and Bill Flickinger bought their home in Moorhead in 1983, it was a great location to raise children. Their backyard abutted the Red River and they felt like they were living in the country yet had the conveniences of the nearby city. Unfortunately, the Flickingers' close proximity to the river became hazardous. From 1983 to 1997, the couple laid sandbags to save their home on three occasions. In the flood of April 1997 (the second highest on record), a sandbag dike rose six feet high just outside the door to the Flickingers' house. From the walkout-level family room, the river rushed by at eye level. With the help of family, friends, and their church, the Flickingers were able to keep water out of the home.

Two months later, more heavy rains fell. The Flickingers' home had made it through the April flood only to have water seep through the foundation in June. Mr. Flickinger asked a friend who was an engineer to inspect house; they discovered that the foundation had moved. The saturated soils from the April flood had caused the house to shift and become structurally unsound. The heavy rain in June then revealed this problem to the homeowners. In response, Mr. Flickinger consulted with City of Moorhead officials and their house was included in a city acquisition project. The City was interested in the property because it abutted the water intake facility for the City's drinking water system. The home was purchased and demolished with the help of FEMA's HMGP acquisition program and the Flickinger family moved to an area known as the Meadows Subdivision.

In 2006, the fifth highest flood on record hit the Moorhead area. This time damage from floodwaters along the Red River was minimal thanks to the buyouts and a sandbag dike. The Flickingers old riverfront home would have been under water during the event.

The City of Moorhead has made many improvements using a variety of Federal and state mitigation funds. For example, dikes have been constructed, storm sewer control gates have been installed, and flood models have been produced. The City also installed sanitary sewer isolation valves on homes remaining in the floodplain and a concrete liner on a ditch to safely move overland floodwater through the city. Sand bagging is necessary in some areas when the river level reaches 35 feet. In 2006, approximately 100 property owners constructed dikes to protect their homes to the 38 foot flood stage.

Clair Hanson, Assistant to the City Engineer of Moorhead, described the City's flood mitigation efforts as follows: "After 1997, the construction of permanent dikes to a 41foot flood stage and the installation of flood control gates on the storm sewer system greatly reduced the cost and efforts for future flood fights. These mitigation efforts allow City staff to concentrate on individual areas of protection and provide close support to residents whose homes are still subject to flooding. In 2006, homeowner dikes were secured within a few days. The City infrastructure was immediately protected by the dikes and storm sewer gates were closed with each rise in river stage. It is a fully operational system now."

### Activity/Project Location

Geographical Area: **Single County in a State**

FEMA Region: **Region V**

State: **Minnesota**

County: **Clay County**

City/Community: **Moorhead**

### Key Activity/Project Information

Sector: **Public/Private Partnership**

Hazard Type: **Flooding**

Activity/Project Type: **Acquisition/Buyouts; Flood Control; Flood Study Map Rollout/ Map Modernization**

Structure Type: **Wood Frame**

Activity/Project Start Date: **05/1998**

Activity/Project End Date: **05/2002**

Funding Source: **Hazard Mitigation Grant Program (HMGP); Homeowner; Local Sources; Map Modernization; National Flood Insurance Program (NFIP); Private funds; State sources; Other Federal Agencies (OFA); Other FEMA funds/ US Department of Homeland Security; Property Owner, Commercial; Property Owner, Residential; U.S. Small Business Administration (SBA)**

Funding Recipient: **Local Government**

Funding Recipient Name: **City of Moorhead, MN**

Application/Project Number: **9999**

### Activity/Project Economic Analysis

Cost: **Amount Not Available**

Non FEMA Cost: **0**

## Activity/Project Disaster Information

Mitigation Resulted From Federal Disaster? **Yes**

Federal Disaster #: **1175 , 04/08/1997**

Federal Disaster Year: **1997**

Value Tested By Disaster? **Yes**

Tested By Federal Disaster #: **No Federal Disaster specified**

Year First Tested: **2002**

Repetitive Loss Property? **No**

## Reference URLs

Reference URL 1: <http://www.cityofmoorhead.com>

Reference URL 2: <http://www.fema.gov/government/grant/hmgp/index.shtm>

## Main Points

- A total of eight repetitive loss properties in 1994, sixteen homes damaged in the 1997 flood, and two additional repetitive loss homes in 2002 have been acquired through the HMGP in Moorhead, MN.
- In 2006, approximately 100 property owners constructed dikes to protect their homes to the 38 foot flood stage.
- In 2006, the fifth highest flood on record hit the Moorhead area. This time damage from the Red River's floodwaters was minimal thanks to the buyouts and dikes.



S. River Drive property after home buy-out (note the white birdfeeder on left).



2006 flood.