ATTACHMENT 1

Page 12 of the Appeal Resolution Document accompanying the September 26, 2000 Preliminary Map.

Geotechnical Investigation

In all FIRMs which FEMA has put forth for Richland County, FEMA has always maintained that Manning's dike and Gill's Creek ring dike are not certified to meet the standards of Section 65.10 of the NFIP regulations. Therefore, land behind these dikes is shown in the floodplain.

When preparing the August 12, 1999, FIRMs, FEMA considered Manning's and Gill's Creek dikes to have an effect on flow conveyance. At that time, FEMA assumed that while these dikes would partially fail, they would still block conveyance through the Richland County floodplain. The appeals received argued for reconsideration of the dikes' effect on flow conveyance. A significant portion of this assumption lies with geotechnical evaluation of the dikes' stability.

The data which FEMA had to consider in geotechnical evaluation include a report dated August 10, 1999, prepared by S&ME, Inc., titled Report of Geotechnical Exploration, Congaree Levee Sections 1 and 2, and a report dated December 9, 1976, prepared by Law Engineering Testing Company, titled Geotechnical Investigation of Dike Failure, Metropolitan Wastewater Treatment Plant, Columbia, South Carolina.

FEMA had these reports while preparing the August 12, 1999 FIRMs, and at that time used them to conclude that the dikes would likely fail in a 100-year flood. Since receiving appeals, FEMA decided to take a more detailed approach, asking the following three main questions:

1. Where are the dikes most likely to breach?
2. What width of breach is likely to occur?
3. How many breaches are likely to occur during a 100-year flood?

The first question was answered by investigating the potential for failure by piping. Piping is the most likely mode of failure, as demonstrated by the two areas that failed in 1976. Shear failure itself is not a likely cause of breaching because of the relatively low height of the levees to the ground, and the fact that they have gained some degree of stability through consolidation over many years. It is possible that there could be some sloughing and sliding of the steeper landside slopes, but this would probably be due to the effect of seepage causing piping and removal of some landside toe support, as is suspected in the south failure during the 1976 flood. Dike sections that had conditions conducive to piping failure were identified; these are shown in Figure 2.