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Corps uses the latest technology in White River Navigation study

Memphis, Tenn., January 26, 2000 — The Memphis District, U.S. Army Corps of Engineers constructed state-of-the-art micro-models to determine the accuracy of proposed dike designs for the White River Navigation Project. The models simulate the water flow and sedimentation conditions found in the White River to help engineers predict the effectiveness of various navigation improvements.

The White River models depict river conditions along two 15-mile stretches of the river. One is for the Clarendon reach, which covers river miles 85 to 100; and the other depicts the river south of Augusta and northeast of Hurricane Lake Wildlife Management Area, which covers river miles 185 to 200.

The Memphis District developed the models in cooperation with the Applied River Engineering Center in St. Louis, Mo. Engineers conducted on-site surveys of the White River to ensure precise measurements were used to construct the 3-D tabletop models. Then, a plastic-like material was placed in the channel to simulate natural transport and deposition of sediments –sand and silt – on the river bottom. The water-flow is controlled by custom computer software that regulates a submersible pump.

Once operating, the currents in the micro-model shift the “sand” much the way actual conditions on the river do – creating sandbars and widening and deepening the channel in desired locations.

Modelers insert small pieces of wire mesh to simulate dikes and chevrons with a half-inch wire mesh

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equaling approximately 200 feet of dike. Corps experts are using the models to evaluate their plans to install wing dikes. The dikes will focus the river's currents in shallow sections accounting for 5 percent of the White River's bottom area. The goal is to maintain a 9-foot channel depth and 125-foot-width.

Jacqueline Whitlock, White River project manager, said the Corps alternatives tested on the micro-models demonstrate minimal impacts to water levels and water quality. "These details are crucial because our objective is to design and construct a project that is economically and environmentally feasible," added Whitlock.

By running the model, researchers are able to test different dike-placement schemes to determine which will work best. So far, premiliary analysis suggests a 6-foot-tall dike could be as effective as the 10-foot dike as originally planned.

The micro-modeling process saves time and resources compared to previous engineering design techniques. According to Robert Davinroy, Director of Applied River Engineering Center, "micro-models can cost as much as $100,000 to construct and analyze, but they are cheaper and easier than earlier experimental models that could be 100 yards long by 5 feet wide and take two to three years to develop and research."

To request copies of maps depicted in the mirco-models, please contact Laschandra Diggs in Corps Public Affairs Office at 901.544.3349.

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