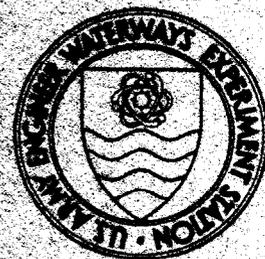


DREDGED MATERIAL RESEARCH PROGRAM



TECHNICAL REPORT D-78-34

FLUME EXPERIMENTS ON SAND, SILT AND CLAY MIXTURES FROM THE OFFSHORE DREDGED MATERIAL DISPOSAL SITE GALVESTON, TEXAS

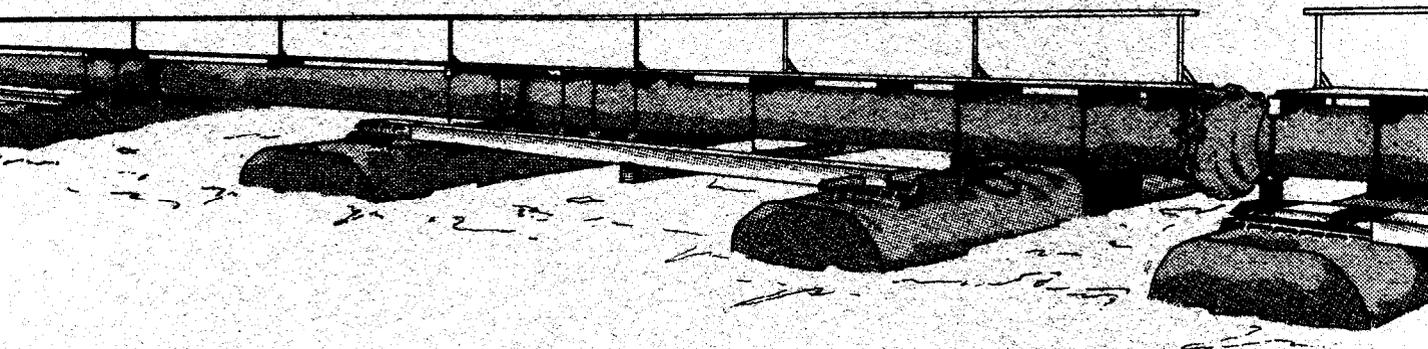
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Final Report

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Monitored by Environmental Laboratory
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31 July 1978

SUBJECT: Transmittal of Technical Report D-78-34

TO: All Report Recipients

1. The technical report transmitted herewith represents the results of Work Unit 1B08A of Task 1B, Movements of Dredged Material, of the Corps of Engineers' Dredged Material Research Program (DMRP). It was a part of the Environmental Impacts and Criteria Development Project (EICDP), which had a general objective of developing techniques for determining the spatial and temporal distribution of dredged material discharged into various hydrologic regimes. The study reported on herein was part of a series of research contracts developed to achieve the EICDP general objective.
2. Regardless of the location or character of a disposal site, an integral part of the problem of assessing the environmental impact of open-water disposal operations is an ability to determine the movement of dredged material. Dredged material at an aquatic disposal site is subject to dispersion by the tidal stream, estuarine circulation, waves, and disturbances of the hydraulic flow by storms. In shallow coastal waters, sediment may be transported periodically by tidal currents or episodically by storm-generated currents. A major objective of this investigation was to evaluate the susceptibility of submerged dredged material mounds to these disturbances.
3. This report describes investigations conducted in the Gulf of Mexico at the Galveston, Texas, dredged material disposal site in order to determine the critical erosion velocity, shear stress, and modes of sediment transport for four sediment mixtures. The four different sediments eroded similarly as evidenced by a similar critical bed shear. Laboratory results were compared with field data, indicating greatest bedload erosion on the northern portions of the site with movement of the sediment away from the Galveston Bay entrance channel.
4. The information and data published in this report are contributions to the further understanding of the complex nature of sediment transport and stability of submerged dredged material deposits and should help establish a baseline from which to develop meaningful evaluations for

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the selection of an environmentally compatible disposal alternative. It is expected that the interpretation of the physical interactions will be of significant value to those persons concerned with CE dredged material permit programs.

A handwritten signature in black ink, appearing to read "John L. Cannon". The signature is written in a cursive, flowing style.

JOHN L. CANNON
Colonel, Corps of Engineers
Commander and Director

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Flume experiments were performed on four sediment mixtures sampled from the offshore Galveston dredged material disposal site in order to determine their critical erosion velocity, shear stress, and modes of sediment transport. Also, an analysis of the offshore Galveston hydrographic regime was performed using meteorologic and oceanographic data. The results of the flume experiments indicated that the four sediment (Continued)			

ABSTRACT. (Continued)

mixtures eroded similarly. Extrapolation of flume results to recorded off-shore bottom current speed measurements indicate that bedload erosion occurs much more frequently near the northern margin of the disposal site. Also, net bedload transport of disposal material is oriented down the coast or offshore from the disposal site, suggesting that material will not likely return to the channel proper as shoaling sediment.

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