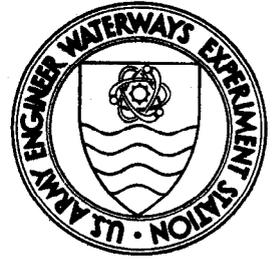


DREDGED MATERIAL RESEARCH PROGRAM



TECHNICAL REPORT D-78-2

AN ASSESSMENT OF THE POTENTIAL IMPACT OF DREDGED MATERIAL DISPOSAL IN THE OPEN OCEAN

by

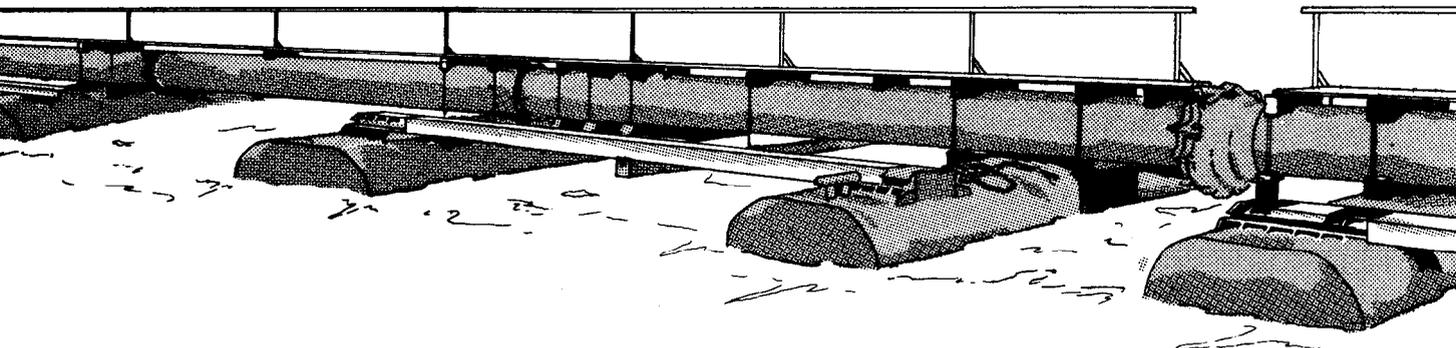
Willis E. Pequegnat
TerEco Corporation
College Station, Texas 77840

in collaboration with
David D. Smith, Rezneat M. Darnell
Bobby J. Presley, Robert O. Reid

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Final Report

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Prepared for Office, Chief of Engineers, U. S. Army
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(DMRP Work Unit No. 1A11)

Monitored by Environmental Effects Laboratory
U. S. Army Engineer Waterways Experiment Station
P. O. Box 631, Vicksburg, Miss. 39180

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P. O. BOX 631
VICKSBURG, MISSISSIPPI 39180

IN REPLY REFER TO: WESYV

15 February 1978

SUBJECT: Transmittal of Technical Report D-78-2

TO: All Report Recipients

1. The technical report transmitted herewith represents the results of one of several research efforts (Work Units) undertaken as part of Task 1A, Aquatic Disposal Field Investigations, of the Corps of Engineers' Dredged Material Research Program. Task 1A is a part of the Environmental Impacts and Criteria Development Project, which has as a general objective determination of the magnitude and extent of effects of disposal sites on organisms and the quality of surrounding water, and the rate, diversity, and extent such sites are recolonized by benthic flora and fauna.

2. The study reported on herein was conducted as Work Unit 1A11 to provide background information on the deep ocean as a disposal alternative to nearshore, estuarine, and inland dredged material disposal sites. In order to provide interim guidance for Corps of Engineers' Districts to design research studies, to develop site-selection criteria, and to assess the environmental consequences of deep ocean disposal of dredged material, it was necessary to review and evaluate the available literature on oceanic environments and oceanic processes, to define technical issues and concerns, and to document the potential research needs and the environmental parameters to be considered.

3. The report discusses factors that indicate that deep ocean disposal of dredged material may have to be used more extensively in the future than now. The literature analyzed relative to the disposal of dredged material or any similar solid waste material in the open ocean includes studies of the distribution of benthic populations, plankton, fisheries, and chemical species in the water column and in the associated sediments; oceanic currents and water masses; and the physical properties of the sea water. The report further categorizes oceanic environments and identifies by category those oceanic regions that may be better suited for continued disposal operations and those that have a greater potential for short-term and/or long-term detrimental or positive impacts.

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4. Results emphasize the need for use of oceanographic information in the selection of disposal sites and the belief that effective management of the use of deep ocean sites will require a basic understanding of marine ecological systems. Therefore, the report provides a working knowledge of the marine environment and its function to facilitate effective selection and use of disposal sites by the managers of deep ocean disposal sites.

5. The results of this study are particularly important in determining sites for deep ocean disposal of dredged material. Referenced studies, as well as the ones evaluated in this report, will aid in determining the optimum disposal conditions and site selection for minimum environmental impact and maximum site use.



JOHN L. CANNON

Colonel, Corps of Engineers
Commander and Director

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Technical Report D-78-2	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) At the outset the report contains a discussion of several factors which indicate that deep ocean disposal of dredged material may need to be utilized much more extensively in the future than now. There follows a delineation and preliminary evaluation of the potential physical, chemical, and biological impacts that may occur from the disposal of dredged material in the deep ocean at and beyond the outer edge of the continental shelves of the United States and its possessions. A substantial part of the report is then devoted (Continued)		

20. ABSTRACT (Continued).

to the selection and description of oceanic areas (not sites) off eleven subdivisions or sectors of the U. S. coasts in which District Engineers or other Corps of Engineers officials may select specific disposal sites.

The main body of the report is composed of two multipartite sections: Section A. Deep Ocean Disposal Perspectives, and Section B. Deep Ocean Disposal Environmental Considerations.

The three major parts of Section A are (1) the basis for and objectives of the study together with an overall evaluation of the need for and impacts of deep ocean disposal of dredged material; (2) a discussion of the dredging-disposal process and the nature of dredged materials; and (3) the actual designation of favorable and poor deep ocean areas for disposal of dredged material, as well as the criteria upon which each selection was based. Emphasis is placed upon the need for utilization of oceanographic information in the selection of disposal sites within these areas, and the belief that effective management of the use of deep ocean sites will require a basic understanding of marine ecological systems. These units are followed by a set of conclusions and a summary of the principal findings. In brief, it is concluded that deep ocean disposal of dredged material can be carried out without appreciable damage to any aspect of the marine environment.

Section B is devoted to (1) a discussion of the workings of marine ecological systems, (2) the essential oceanographic conditions existing off the coasts of all geographic sectors of the United States and its possessions, and (3) an analysis of the fate of dredged material disposed in the deep ocean and the potential impacts that it may generate. Thus, this section of the report was designed to provide the managers of disposal sites in the Corps of Engineers with a working knowledge of the marine environment and its functions in their Districts in order to facilitate effective selection and use of disposal sites.