

New Edition of 'Environmental Aspects of Dredging'

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FOREWORD

Since the industrial revolution, people have been interfering with the environment at an ever-increasing rate. Our past lack of understanding and lack of appreciation of our environment have brought us to a point where this interference is manifesting itself in ways that can no longer be ignored.

Studies conducted on a worldwide basis have shown that, if we are to try to guarantee the future of human existence, we must take a more responsible attitude towards how we live and behave in our environment. Growing public awareness and concern endorse the view that sustainability is paramount.

Dredging is a necessary activity in civilisation's development. Given the right circumstances, dredging may also be a useful tool for remedying past environmental interference. By its very nature, however, the act of dredging is an environmental impact. It is, therefore, of the utmost importance that we be able to determine whether any planned dredging will have a positive or negative impact on our environment. Evaluation of environmental impact should examine both the short- and long-term effects, as well as the sustainability of the altered environment.

In its simplest form dredging consists of the excavation of material from a sea-, river or lake bed and the relocation of the excavated material elsewhere. It is commonly used to improve the navigable depths in ports, harbours and shipping channels or to win minerals from underwater deposits. It may also be used to improve drainage, reclaim land, improve sea or river defences or clean up the environment.

Dredging techniques and dredging activities in and of themselves will always make some change in the environment. Although dredging always seeks to improve a given situation awareness of the repercussions of change is essential. For instance,

- alterations to coastal or river morphology may result in enhancement or loss of amenity, addition or reduction of wildlife habitat;
- alterations to water currents and wave climates may affect navigation, coastal defence and other coastal matters;
- reduction or improvement of water quality will affect benthic fauna, fish spawning and the like.

The question of the duration of such effects, long term or short term, is also important to consider. Environmental effects of dredging may include increases in the level of suspended sediment in the vicinity owing to the excavation process, the overflow while loading hoppers, and the loss of dredged material from hoppers or pipelines during transport. At the placement site there may be disturbance or loss of benthic fauna. Most often, however, these effects will change the environment to a lesser extent in the long term than will be immediately apparent.

Frequently, the level of suspended sediments generated by dredging activities are no greater than those caused by commercial shipping or bottom fishing operations, or even those generated during severe storms. Unfortunately this is often difficult to demonstrate without undertaking comprehensive studies. Yet the investment in these studies may prove to have added value in the long run.

The marine environment is a complex combination of natural features and phenomena, supporting a diverse but largely concealed, underwater population. Because of this complexity, predicting the effects of human-induced changes and short-term operations is extremely difficult. Comprehensive and detailed investigations of environmental characteristics are frequently an essential prerequisite for any planned dredging activity, together with an assessment of all the potential pros and cons. Of course, it goes without saying that re-suspension of contaminated materials poses special problems and demands rigorous scientific analysis.

Neglecting environmental issues in the past has resulted in the present situation in the industrialised nations where many rivers, ports and harbours contain soils that have been contaminated by undesirable levels of metals and chemical compounds. When dredging in these soils, contaminants may be released into the water column and thence into the food chain. Thus, the environmental effects of dredging and relocation of the dredged material may be more severe than when dredging clean material and will require closer scrutiny. In certain cases the very existence of the contaminated soils has led to dredging: by removing the contaminated soils and placing them in a more secure location, the environment is improved. The treatment and storage of contaminated soils is a highly complex subject and requires detailed study. Long-term improvement does, of course, depend ultimately on preventing pollution at its source.

Nowadays an international framework of legislation relating to dredging and the management of dredged material at sea has been developed. This contains regulations, which must be implemented by national authorities. A number of European countries are also developing legislation to control the placement of dredged material on land. Such legislation is constantly changing, as scientific knowledge increases and implementation frameworks evolve. All promoters of dredging works need to be aware of current legal requirements.

An additional positive environmental aspect of dredging, one that is actively encouraged by the controlling authorities, is the reuse of dredged material, even including some that is contaminated. Typical uses include beach nourishment for sea defence, the creation of wetlands for recreation and wildlife sanctuaries, reclamation of land for commercial and industrial development, and the improvement of agricultural land.

This one-volume IADC/CEDA publication *The Environmental Aspects of Dredging* has been created by integrating the seven stand-alone guides, which formed the series of the same name published between 1996 and 2001, and by updating and adding to the original material to reflect advances made in recent years.

The Editorial Board
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