

FACTS ABOUT

Selecting a Destination for Dredged Material

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WHY CONSIDER THE DESTINATION OF DREDGED MATERIAL?

One of the first areas of concern when executing a dredging project is always “what will be done with the dredged material?” Every dredging project should take into consideration the final use or destination of the sediment that will be excavated. Failing to examine this prior to starting a project has led to many conflicts, protests and legal delays. The misunderstandings arise quite often from a lack of knowledge of what dredged material actually is.

WHEN SHOULD THE DESTINATION OF DREDGED MATERIAL BE CONSIDERED?

As soon as possible during the planning stage. The nature of the project, the characteristics of the dredged material and the accessibility to placement sites are all factors to be considered early on. These factors will guide decisions about the total costs of the project. The type of material, the potential use of the material, the distance to a suitable placement site, the mode of transportation to the placement site, the possibility of dredged material treatment – all these aspects have financial and environmental consequences.

DO DIFFERENT TYPES OF DREDGED MATERIAL REQUIRE DIFFERENT SOLUTIONS?

Dredged material is a variety of substances: It can be rock, sediment and various types of sand depending on the area of the world in which the dredging project is taking place. In starting to discuss the destination of dredged material, the range of materials must be considered. Most dredged material is clean and does by itself not present an environmental threat. It can thus be placed or disposed of safely in a variety of ways depending on the type of project, the location and the needs of the community. The portion of dredged material that is contaminated, usually originating from highly industrialised areas, must be disposed of in a secure fashion.

DO TYPES OF DREDGED MATERIAL DIFFER FROM PROJECT TO PROJECT?

A distinction should be made between the removal of sediments during maintenance dredging projects and sediments dredged from new projects. Maintenance

dredging sediments have been accumulating in the channel or on the waterbed since the last time that particular area has been dredged. Dredging for new projects involves the removal of sediments which have most likely not previously been dredged. In both cases the nature of the material to be dredged must be examined and evaluated. However, depending on the part of the world, this new works *vs* maintenance works has different demands.

For instance, in less industrialised regions, new projects may be set in pristine areas. Disposal is not then an issue of contaminated *vs* clean sediment. The issue becomes where should placement take place, as this natural, unspoilt environment may be sensitive to *any* disturbance or foreign substance brought into the placement area.

In the USA the majority of dredging work is maintenance and is often executed in ports and rivers where the issue of contamination plays a critical role. European ports and harbours confront the same challenge. Dredging in these contaminated waterways is on the one hand necessary – to restore the cleanliness of the waters – and on the other controversial – where will the contaminated sediment be placed? The development of a placement plan is crucial to the success of a project.

WHAT ARE SOME GUIDELINES FOR THE SELECTION OF A DESTINATION FOR DREDGED MATERIAL?

To start with, “do no harm”. That is, the dredged material to be placed on the seabed should not interfere with other uses of the sea and the marine environment. A few guidelines are:

- look for disposal areas within reasonable distance of the dredging site
- assess the characteristics of the dredged material
- choose a few potential disposal sites and assess potential impacts of the proposed material at each of these sites and the acceptability of these impacts
- compare the probable impacts at the various sites.

Based on these assessments and comparative evaluations a destination can be selected where the adverse impacts will be acceptable or, even better, where a useful purpose can be found.

WHAT ARE THE POSSIBLE DESTINATIONS FOR DREDGED MATERIAL?

Dredged material destinations can be split into roughly three options:

- Use applications: Most dredged material is not “dirty” or a “waste” although this is not always accepted wisdom. Still amongst those who do accept this premise, efforts have increased to find useful destinations for the sediment. This should be the first option considered.
- Open-water Placement: This can be in the ocean, estuarine waters, lakes and rivers, all of which are highly regulated and restricted.
- Confined Disposal: When no other option is available, confined disposal takes place in a structure which isolates the dredged material from the surroundings, e.g., within a diked area either in water or on land.

WHEN IS THE USE OPTION SUITABLE?

Finding a use for dredged material should always be the first course of action, because this can be cost effective and support sustainability. That means that if the dredged material is “clean” and in principle suitable for open-water placement, it can also be suitable for a sound use. But that requires going a step further and looking beyond the straightforward option of open-water placement.

The use option may be to benefit other areas, such as the restoration of wetland habitats, which are increasingly used for shoreline protection, and/or beach nourishment, which provides recreational facilities but also guards the hinterland. Dredged material has also been used for the restoration of mining areas and for the nourishment and improvement of soil in agricultural areas. Habitat restoration and the construction of artificial islands, which are used for habitat preservation, as well as to expand land for other uses (airports, residences) and construction materials are all accepted uses for clean dredged material.

WHEN IS OPEN-WATER PLACEMENT SUITABLE?

If no use can be found, the next consideration should be open-water placement. Although open-water placement may be inexpensive, it gives the least amount of control over hydrodynamic and environmental aspects. The suitability of the open-water option must be carefully determined by taking sediment samples which are then evaluated for chemical and biological composition. Both the dredged material itself and the placement area will be evaluated for compatibility. In sensitive open-water environments, for instance, where there are coral reefs and other marine flora and fauna, placement of sediment, even if it is clean and compatible, may be deemed unsuitable as the act itself of

placing the dredged material in pristine waters may cause unwanted disturbances.

WHEN IS CONFINED DISPOSAL SUITABLE?

Confined disposal is usually the option of last resort. When the dredged material is contaminated and has not been or cannot be cleaned, then placing it in a confined disposal area, be it on land or at sea, is the only choice. In water or underwater confined disposal can be complex: Space is not an issue but ensuring complete control over the isolation of the materials may not be possible. On land, the opposite is true: Confined disposal options can be controlled better but options are limited by the space available. Using either confined land or water disposal, the solutions are costly.

CAN AND SHOULD DREDGED MATERIAL BE TREATED?

Generally speaking, treating dredged materials can be considered a way of improving its suitability, either by improving its environmental properties and/or providing economic benefits. Specialised equipment and technologies are available to treat, separate or consolidate sediments; however, the cost of treatment, must be calculated.

WHAT IS THE MOST DIRECT METHOD FOR DREDGED MATERIAL PLACEMENT?

As mentioned above, most dredged material is clean and often dredged material is just the sediment that forms part of the dynamics of a river, estuary or coastal area in which it resides. In those cases, returning the dredged material to the same sedimentary system it came from, but at a more preferable location, may be the best placement solution.

WHO IS RESPONSIBLE FOR FINDING A DESTINATION FOR DREDGED MATERIAL?

The responsible parties include the project owner and government officials who must initiate the permitting process. The issuance of permits comes from a government agency and must quite often meet strict requirements. But it is incumbent upon the project owner to make sure these requirements are met. On the other hand, stakeholders need to have a say in the matter as the results of dredging may impact them in ways that owners and authorities do not realise.

Dredging contractors can also make a significant contribution to the decision-making process about dredged material placement. Contractors understand the mechanics of handling and transporting dredged material and can offer data and background information learnt from their practical experience. Whereas an owner or stakeholder may encounter a dredging operation once in a lifetime,

Consultants, government officials and community representatives visit a treatment plant on the banks of a highly contaminated river, part of a project to improve the quality of the river and restore its accessibility to the public. A Community Health & Safety Plan for the removal project was developed with input from the Community Advisory Group, who ensured that the concerns of the residents were considered in designing the cleanup plan.



contractors are confronted repeatedly with compliance questions.

HOW ARE THE PLACEMENT AND/OR DISPOSAL OF DREDGED MATERIAL REGULATED?

Regulations are issued on local, regional and international levels. In June 2008 the European Parliament adopted compromise wording for a new Waste Framework Directive (WFD) which excluded dredged material from the Directive's jurisdiction and aligned the EU with international law as specified in the London Convention (LC). The LC has very clear requirements about open-water placement. As a result of this 2008 Directive, about 90% of all material dredged in Europe was in effect eliminated from the category of "waste". This amounts to about a quarter of a million tonnes per year. Only hazardous material remains in the category of waste.

In the past, the classification of dredged material as a waste – and not a natural resource – caused delays for dredging projects for port maintenance, navigation channels, flood protection and other essential dredging operations. The exclusion of non-hazardous dredged material from the scope of the Directive means that dredging operations now fall entirely under national regulatory agencies.

WHAT IS NATURA 2000 AND DOES IT IMPACT THE DESTINATION OF DREDGED MATERIAL?

In 1992 the EU established a network of protected nature sites known collectively as Natura 2000. The aim is to safeguard Europe's most important wildlife areas. Within this ecological network of protected areas, special measures have been taken to conserve biological diversity. Natura 2000 has resulted in the protection of vulnerable species, however, these protected areas are frequently found near

estuaries, wetlands or along coastlines and the presence of protected species at these sites could and has led to restrictions in dredging permits to work in their vicinity. Ports have found themselves restricted when the need arose for channel deepening or infrastructure expansion. This has led to delays and increased costs. The same is true of coastal defense projects. In most cases the need for increased monitoring in sensitive areas (also a cost factor) has certainly grown.

The need for a balanced approach where nature is protected but economic progress is not hindered has led the dredging industry to seek new approaches to the issue of dredged material placement. The "Building with Nature" programme is one way in which the industry has pro-actively sought to provide better designs for sustainable solutions.

WHAT IS A "FLEXIBLE DISPOSAL STRATEGY"?

A new, hi-tech, environmentally sound approach is reflected in a project located on the maritime border of Belgium and the Netherlands. This system of "flexible disposal" demands a global view on the morphological behaviour of the estuary and flexibility in the destination options used during the complete duration of the project. This physics-based strategy is required to contribute to the morphological equilibrium of the multi-channel system, by encouraging the creation of new ecologically valuable areas near sand bars as well as conserving the existing ecologically valuable areas in the estuary.

The initial strategy is to consider spreading the capital and maintenance dredging volumes over the different morphological entities – secondary channels, new ecological disposal areas near sand bars and deeper parts of the navigation channel. This initial strategy is subject to adaptation according to the findings of environmental monitoring and new study results during the lifetime of the project.



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To implement this flexible strategy, a variety of specific placement techniques have been used to create valuable habitats in new shallow placement areas. Some small TSHDs are being used to release sediment through bottom doors and others are using spray or diffuser pontoons in restricted water depths. All dredging activities are being closely scrutinised with a monitoring plan that includes technical, morphological and ecological components and the disposal activities are quickly adapted when needed.

ARE THERE LOW-COST SOLUTIONS FOR DETERMINING THE DESTINATION OF DREDGED MATERIAL?

The London Convention (LC) and its 1996 Protocol (LP) are global conventions to protect the marine environment and the most widely applicable legislative instruments for the regulation of the disposal of dredged material at sea. The LC/LP identified the need to develop a low-technology approach to dredged material management to help countries where regulations are currently absent or in development and where technical equipment and knowhow is lacking or too expensive to realistically set up. Although some solutions will indeed be costly, a document recently issued by the IMO offers means of assessing dredged material and selecting disposal sites in less expensive ways.

This training set extension to the LC/LP Waste Assessment Guidelines (WAG) is based on the LC Specific Guidelines for Assessment of Dredged Material specifically aimed at the application of low-technology techniques for assessing dredged material (Low-tech WAG). It provides information on low-cost sampling, testing, information gathering and documenting, low-cost monitoring and feedback surveys to help improve decision-making in relation to the destination of dredged material. The low-tech approach is seen as a temporary measure which allows countries to adopt a sound environmental approach to the management of dredged material even if they have not yet developed sufficient capability to follow the full approach of the LC/LP Guidelines.

WHAT ARE THE MAIN CHALLENGES IN SELECTING A DESTINATION FOR DREDGED MATERIAL?

Although at first glance, the biggest challenges would seem

to be when the dredged material is not clean, this is not necessarily the case. Even the 90 percent of dredged material that is clean can create opposition when it comes to finding a suitable destination. The issue remains one of the most difficult discussion points in planning a dredging project.

The public's perception of dredged material as a waste remains a stumbling block. Consequently, for both economic and environmental purposes, creating a clear communication plan early on, one which addresses the question of the destination of dredged material and confronts potential obstacles is a crucial step in avoiding conflicts and finding feasible solutions acceptable to all parties.

FOR FURTHER READING AND INFORMATION

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This brochure is presented by the International Association of Dredging Companies whose members offer the highest quality and professionalism in dredging and maritime construction. The information presented here is part of an on-going effort to support clients and others in understanding the fundamental principles of dredging and maritime construction.

