

# Sediment treatment in Hamburg as part of a Circular Economy

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In the late 1970's contamination of Elbe sediments was detected which led to treatment and safe disposal of dredged material on land. New concepts were developed and several ideas to treat and re-use sediments have been put to practice on various scales.

The closedown of whole industries in former Eastern Europe and the implementation of treatment plants resulted in a decreasing contamination of sediments in the 1990's which facilitated the relocation of dredged material for the port. Today due to upstream secondary sources sediment contamination in the Elbe estuary still exceeds lower guidance values of Germany's dredged material regulation, hence contamination remains a key issue.

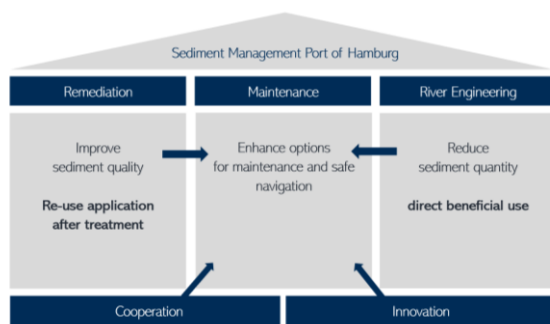
Sediments belong to the river system and should remain inside the aquatic environment. However depending on contamination levels beneficial uses are often limited and still today land disposal is crucial for parts of the sediments to be dredged. The history of dredged material options includes a variety of possibilities following the concept of a circular economy. The strategic framework includes these options as it considers re-use of sediments that have higher levels of contamination as well as clean sediments for beneficial purposes, see Fig.1:

Following the concept of a circular economy there are major beneficial use options, referred to as the "big five" in which large scale experiences have successfully been collected over the past decades:

- (1) Applications of sandy dredged material for e.g. construction purposes
- (2) Treated silty dredged material as sealing material on landfills
- (3) Sediments fractions as substitute for clay in dike construction
- (4) Use of sandy as well as silty sediments for backfilling purposes
- (5) Industrial application in light-weight ceramic products

As a pre-requisite for further uses treatment in the METHA-plant is required. Even after 25 years in use it is still a key technology of the Hamburg Dredged Material Management concept which includes different technologies for treatment, beneficial use, and disposal of dredged material while, at the same time, taking care of the environment.

The presentation will discuss the role of sediment management elements, amongst others the big five, as part of a circular economy for sediments.



**Fig. 1:** Strategic framework for sediment management for the Port of Hamburg and the tidal Elbe