

## Sediment management: towards a clean port



### **Rotterdam, a sustainable clean port**

Rotterdam's port and industrial complex to a great extent owes its leading international position to its geographical location on the North Sea and the estuaries of the rivers Rhine and Meuse. Tidal movement carries many millions of cubic meters of sand and silt (sediment) annually from the sea into the port. The Rhine and Meuse add a further substantial quantity of sediment from the hinterland to this. Since the flow velocity strongly decreases in the estuary, a large portion of this sediment settles on the riverbed and in the port basins. Without dredging, the port would soon silt up.

To guarantee access to the port for shipping traffic, dredging activities are continuously carried out. Each year, some 20 million cubic meters of sediment is dredged in Rotterdam. This is commissioned by the parties responsible for managing the port area and the river: The Port of Rotterdam (PoR) and the Ministry of Transport, Public Works and Water Management. Most of this material is relocated at sea. Despite all the measures taken, about one and half million cubic meters of contaminated sediment is still dredged annually. This sediment is stored in a special storage depot: 'De Slufter' at the Maasvlakte.

The objective of the PoR is to ensure that all dredged material is sufficiently clean by 2015, that it can be relocated at sea or be beneficially re-used. Source control and sediment management constitute the cornerstones of this policy.

### **Source control**

The policy of the PoR is aimed at tackling problem substances at the source. Under the header 'the polluter pays' Rotterdam in the eighties tried to locate the parties responsible for the contamination of the dredged material. The main focus was at so-called 'point dischargers': clearly identifiable companies along the Rhine and in the port itself. This approach led to a significant reduction of these direct discharges. For many years, the Rhine Research Project (Project Onderzoek Rijn, POR) symbolized Rotterdam's endeavours to improve the port environment. Agreements were successfully made with virtually all the major dischargers on significant reductions in their discharges.

This represented an important impulse for the quality of the Rhine water and consequently the quality of the dredged material in the port of Rotterdam.

In 2000, Rotterdam initiated the follow-up project POR II. This study showed that diffuse sources stood in the way of further improving the quality of the dredged material. This concerns for instance

the emission of combustion products of fossil fuels and other emitted substances that enter the Rhine via the atmosphere. Through groundwater and paved urban areas, contaminants also still end up in the Rhine.

As a conclusion to POR II, a study into the so-called alllasten in the Rhine was carried out. Alllasten are historical contaminated sediments that are slowly released into the river. The conclusion is that these alllasten offer a significant contribution to the contamination of the Rhine. Climate change in addition may lead to a higher occurrence of high waters and it is especially then that these 'legacies of the past' cause an additional impact for the Rhine and port environment.

### ***Sediment management***

About half of the sediment from the Rhine that reaches Rotterdam settles in the port.

The remainder flows directly with the river into the North Sea. This underlines the need to view the Rhine and the North Sea as a continuum/ one system. The PoR is not in a position to solve the sediment management issues in the entire Rhine basin on its own. It is necessary that the Rhine riparian states – united in the International Commission for the Protection of the Rhine – draw up a coordinating Sediment Management Plan comprising concrete measures. This must result in responsible sediment management for the Rhine with an assessment of the risks that contamination poses to, among other locations, the port of Rotterdam. The contaminated sediment locations in the Rhine, which are considered to be a risk, need to be dealt with at a local scale. Rhine riparian states that fail to do so significantly contribute to the diffuse transportation of contaminants into the environment, with negative impacts for the Rhine basin and North Sea and also for downstream sediment managers like the port of Rotterdam.

The PoR is actively monitoring the developments of the European Water Framework Directive. At the end of 2000, this directive, which aims to harmonize the policies for surface water, and with that also for sediments, was adopted in Brussels. To the opinion of the PoR, sediment and the relationship between the river basin and the receiving marine coastal zone should be on the European agenda. Collaboration with relevant organizations is an important implied objective. A good example of the PoR's commitment to this issue is the fact that it was at the cradle of the establishment of the European Sediment Network (SedNet) in 2001.

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