



Analysis of sediment contamination in the harbour of Skikda

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Abstract

The aim of this work is the study of the vase pollution in harbours occurred due to the high intense hydro-dynamism, which involves the sedimentation of pollutant substances. Some of these substances could have a toxic character, like heavy metals. In this work, chemical analyses were carried out on samples taken from the studied area. The results were treated using an approach, which enables us to distinguish the dredged sediment, according to their contamination level, and there potential toxicity. Using a simplified method, the already mentioned approach allows the determination of the risk levels, taking into account the actual codes, and also provides help in differentiating between dredged sediments, thus bringing a decision-making aid for managers.

Key words: Harbour of Skikda, Sedimentation, Contamination, Risk levels, Pollutants substances.

1. Introduction

The harbour structures are generally established in zones where the depth of water is relatively low. It is then essential to carry out dredging in order to facilitate the navigation in harbors. The dredging is carried out periodically to remove the sediments which accumulated in the channels. In countries bordering the Atlantic Ocean and the North Sea, the annually dredged sediment is about 70 to 85 million tons, which are rejected into the sea or are stored in selected zones (Abdurrahman and Dettmann, 1993). The coastal sediments contain many chemical substances, containing organic and inorganic components (Table 1), and they could have a toxic character: heavy metals, poly-aromatics, organ-chlorinated hydrocarbons (PCB), various pesticides and biocides (Zourarah *et al.*,

2005; 2007; Cossa and Coquery, 2005 ; Clarisse *et al.*, 2003; Le Hir, 2001; Wang *et al.*, 2008).

Table 1

Concentrations while contaminating in materials dredged from 1986 to 1993 (Geode source).

Concentration (mg/kg)	The Munch / NorthSea	The Atlantic Ocean	The Mediterranean Sea
Mercury	0,15 - 1,45	0,05 - 0,19	1,16 - 2,51
Cadmium	0,5 - 0,95	0,27 - 0,64	0,27 - 0,64
Arsenic	3,9 - 13,8	4,4 - 28,7	10,4 - 11,2
Lead	36 - 59	41 - 75	93 - 357
Chromium plate	38 - 65	37 - 75	56 - 74
Copper	18 - 35	10 - 53	107 - 745
Zinc	105 - 175	180 - 60	274 - 506
Nickel	12 - 17	6 - 39	25
PCB	0,01 - 0,14	0,005 - 0,1	0,1 - 0,81

The risk is a parameter that characterises an undesirable even to its occurrence probability and to its