A NEW APPROACH TO SOIL POLLUTION CONTROL IN THE ROTTERDAM "EUROPOORT-BOTLEK" INDUSTRIAL AREA

W. Visser, Delft Geotechnics, P.O.Box 69, 2600 AB, DELFT
F. Rodewijk, Stichting Eurooport Botlek Belangen, P.O.Box 121, 3100 AC, SCHIEDAM

1. SUMMARY
The Rotterdam "Eurooport-Botlek" area is one of the largest industrialized areas in the world and of major importance for the Dutch economy. In view of the increased concern for the environment and new legislation on soil protection, the foundation "Eurooport-Botlek Belangen" (EBB) has taken the initiative to investigate the quality of the groundwater in the area. The prime objective of this first stage of the investigation was to establish possible risks due to soil contamination in the area. For this purpose Delft Geotechnics was invited as technical consultant. Delft Geotechnics set up a large-scale inventory and modelling study resulting in a completely new approach (the cluster approach) towards soil pollution control on industrial sites. From these studies it appeared that, although locally contamination of the groundwater was found, in the short term there exists no serious risks for the surrounding area. Based on the results of the study a 25 year strategy was formulated by the EBB to counter the soil contamination problems and to remediate soil and groundwater quality to acceptable standards. With the completion of this phase of the study the companies affiliated to the EBB are at least five years ahead of the intended policy of the Dutch government which states that a first inventory of soil contamination on industrial sites should start in 1991 and finished in 1996.

2. INTRODUCTION
West of the city of Rotterdam an extensive industrial area is situated which is called the "Eurooport-Botlek" area. It comprises a total surface area of 50 km² completely taken up by petro-chemical complexes, bulk transhipment facilities, container terminals etc. (see Fig. 1). All these different industrial activities have had their own impact on the local soil and groundwater quality, during decades of operation. Moreover it became clear that in many cases a site contamination might easily migrate towards adjoining sites through the groundwater, resulting in countermeasures needing the cooperation of the companies involved.

---

FIGURE 1. Map of the 50 km² EBB-area and division into clusters

---

In the Netherlands the maximum allowable concentrations (MAC-values) in soil and groundwater are defined in the Interim Clean-up Act [1]. This Clean-up Act will be included in the new Soil Protection Act shortly [2]. It is felt however, by industries as well as by local authorities that that rigorous application of these standards to industrial sites still in operation could have disastrous effects on economy because of disrupture and discontinuation of industrial activities. The industry therefore suggests standards related to industrial activities. A special committee (BSB or "committee Oele"), including members from the industries as well as authorities, was established to advise the government on these matters.

The companies affiliated to the foundation "Europoort-Botlek Belangen" took the initiative to set up a regional study into soil and groundwater quality and the risks of contaminant migration to the surrounding area. For this purpose Delft Geotechnics was invited as a technical advisor. The so-called EBB cluster study started in 1987. First the possible consequences of industrial calamities in the EBB area for soil and groundwater quality, and the risks of contaminant migration towards the immediate surroundings were evaluated. This regional investigation was followed by an extensive inventory of the groundwater quality, together with computer modelling on a more detailed scale to picture the actual groundwater contamination situation and the related migration risks. A new approach towards soil and groundwater pollution control was formulated (the "cluster concept") to define a future strategy for soil and groundwater remediation in the area.

This strategy has been used by the EBB to draw up a plan of action for the next 25 years. The local authorities have given their consent to the approach and the counter-measures proposed.

2. EBB POLICY
2.1. Organisation
The foundation "Europoort-Botlek Belangen" (EBB) was set up in 1962 with the aim to promote the common (non-commercial) interests of the companies affiliated to it. On request of the companies the EBB is involved in a number of matters as working conditions, housing for employees, environment etc. It was envisaged that soil contamination may also become a common problem for a number of companies. In the Europoort-Botlek area the EBB was considered as the ideal organisation to formulate a common policy with respect to soil contamination, for discussions with the authorities, to coordinate and organize studies on a regional scale etc.

Therefore it was decided that the present groundwater contamination study should be coordinated by the EBB. For the supervision a working group has been installed with representatives from each cluster (for definition of a cluster refer to section 3). Each representative is responsible for the coordination of activities in his cluster. As the division into clusters was based on geohydrological boundaries the number of companies in a cluster varies between 2 and 20. Also a few companies not affiliated to the EBB participated in the study so that the whole area was covered by the study.

2.2. Principles
As rigorous application of the standards from the Interim Clean-up Act is not considered a viable option an alternative policy is proposed by the EBB based on a risk evaluation and standards related to the use of a site.