



# Sector approach soil sanitation

## A vision of an industrial stakeholder

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Base Chemicals



## Get to know

- 44 years within Akzo Nobel
- From origin Analytical Chemist
  - 25 year Research
  - 16 year QA
- Since 1989 working at the chlorine plant Botlek (QA)
- From 2000 up to now working as Soil coordinator
- From 2003 up to now Environmental Manager



## Limitations

- Speaking as employee Akzo Nobel Botlek, and
- Participant Welcome study and pilot Botlek
- Agreed with colleagues in the region (Deltalinqs)



## Motivation industrie

- National Law and rules sanitation
- European rules: Water Framework directive and daughter directive Groundwater
- Social responsibility



## Motivation authorities

- Amongst others:
- Social responsibility
- Fulfilling demands in law and order
- Specific for Port of Rotterdam: More dynamics in harbour area, more transactions with significant soil pollution



## From Biohaven to Welcome and pilot Botlek

- 2000 Bio-harbour study
- 2002 Cost study Port of Rotterdam
- 2003-2005 Welcome study
- 2006-2007 pilot Botlek (study sector approach)

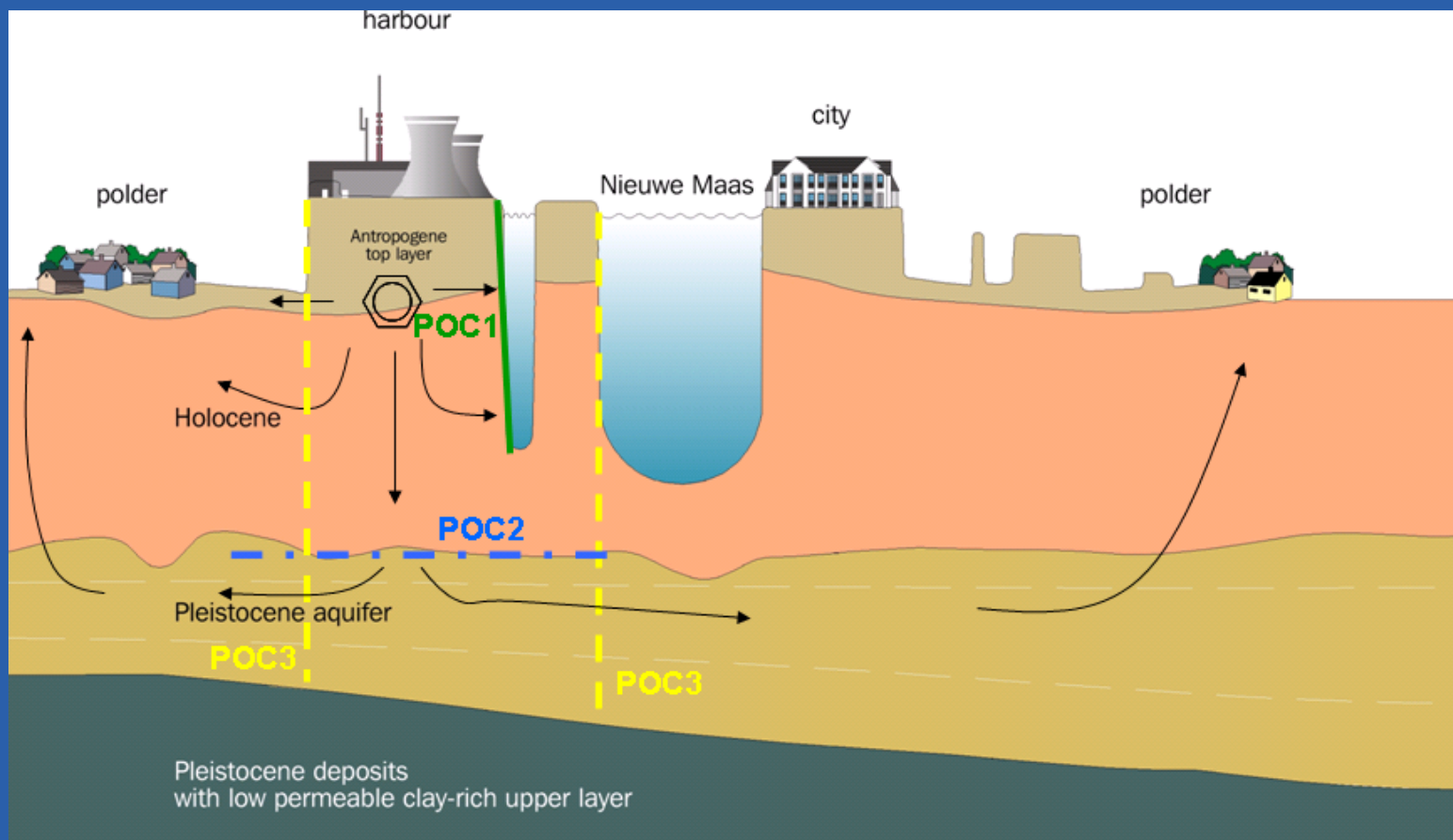




## PP6331 Gebiedsgerichte aanpak Rotterdamse havengebied, pilot Botlek 9P8373

- **Consortium:**
- Havenbedrijf Rotterdam NV (HbR)
- Akzo Nobel Base Chemicals BV (Akzo Nobel)
- DSM Special product Rotterdam BV (DSM)
- Huntsman Holland BV (Huntsman)
- Lyondell Chemie Nederland BV (Lyondell)
- Vopak Terminal Chemiehaven BV / Vopak Terminal Laurens haven BV (Vopak)
- Shell Nederland Raffinaderij BV (Shell)
- Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer (VROM)
- DCMR Milieudienst Rijnmond (DCMR)
- Rijkswaterstaat (RWS)
- Deltalinqs

# Conceptual model Welcome





## Results pre-studies ( 2005)

- Present practice not always in relation with actual knowledge
- Limitations due to law and order
- Individual approach very costfull (border limitations)
- Limitations in effectivity.



## Mixed strategy

- **Combination of a case approach (toplayer) and sector approach (deep groundwater)**
- **Integrally problemprocessing by:**
  - selective removal sources
  - (forced) natural demolition in deep/deeper groundwater
  - ‘smart’ monitoring
- **Expected cost reduction about 40 tot 50 %**



## Business interests

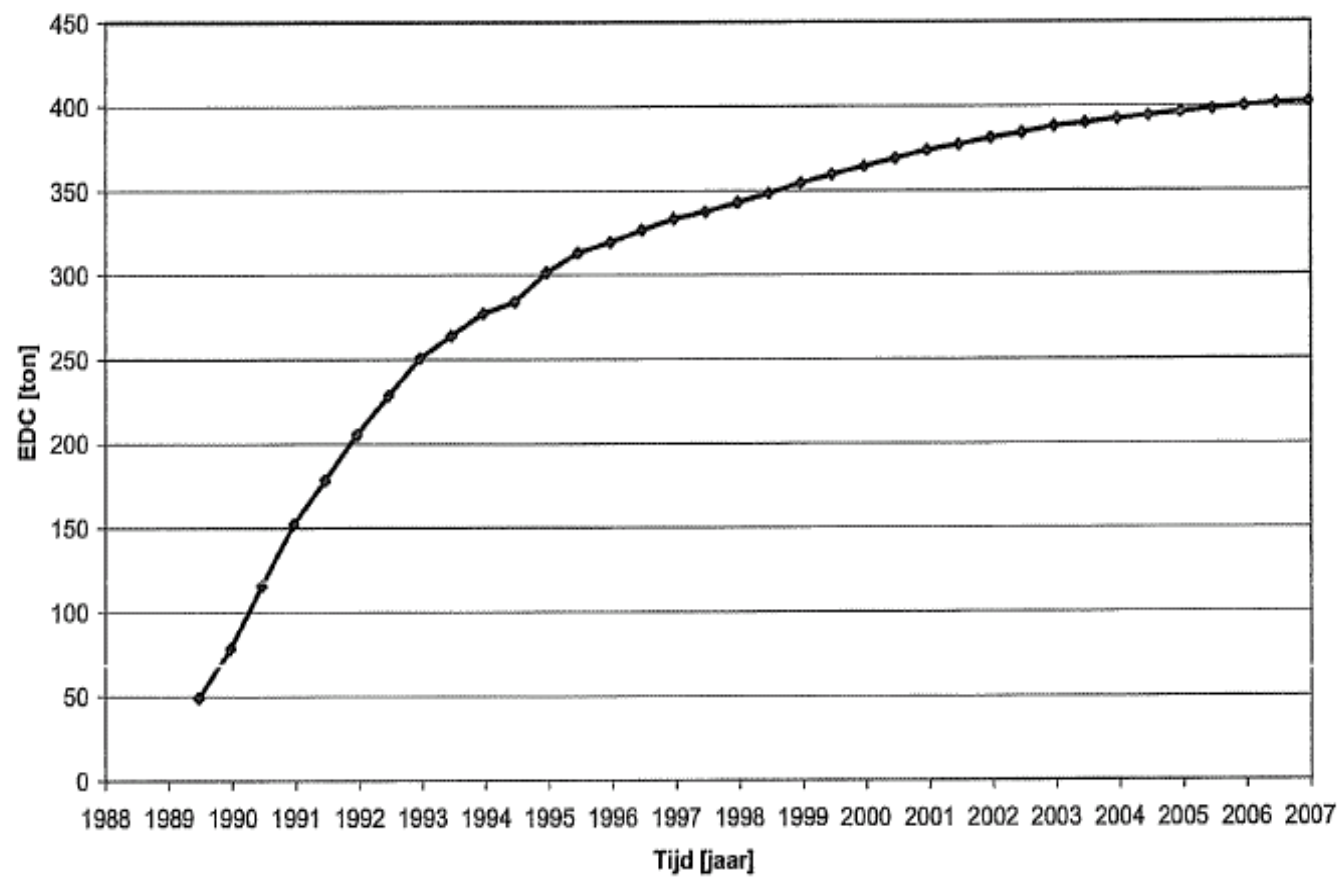
- **Developments-Opportunities (ie NA)**
- **No core-business**
- **Efficiency-Costs optimisation**
- **Positive attitude to society (License to Operate)**
- **Eliminating Risks**



## Example (Akzo Nobel)

- 2 Large incidents (1975/1987) tank leakage with large spill EDC (ethylene dichloride)
- Due to sandpiles spill to Pleistocene (first aquafied layer)
- Installation pump & treat (1989) to stabilise spill within area borders plant
- Side effect: removing nearly 400 tons EDC from

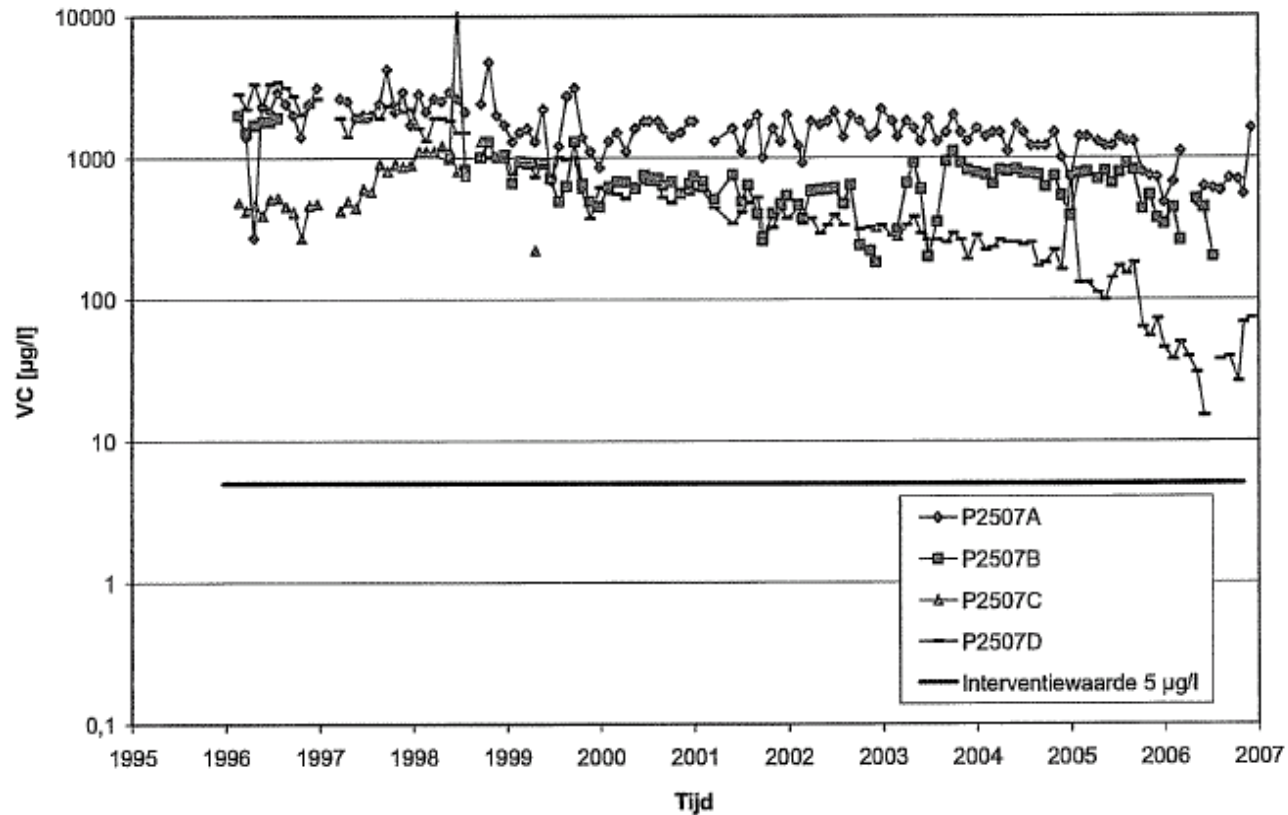
# Removed EDC (mass)



Figuur 3.3 Totale hoeveelheid onttrokken EDC

# Removed EDC (concentration)

Figuur 3.1 Concentratieontwikkeling EDC onttrokken grondwater





## Cost comparison versus result

- Continuing pump & treat
  - Costs estimation €23 millio
  - < 100 year to reach acceptable values
- Mixed strategy:
  - Cost estimation below €10 millio
  - In 2134 no cross-over of border limits



## What do we need?

- It is and remains industrial area
- Law and order in agreement new strategy
  - ie: In certain circumstances, Member States should be authorised to grant exemptions from measures to prevent or limit the input of pollutants into groundwater.
- Agreement with authorities for new approach



## What is still going on at Akzo Nobel Botlek

- Our Preferences are going to the new approach
- Study alternatives sanitation is going on
  - Is there a necessity for sanitation upper layer?
  - Upgrading P&T?
- Study TNO for Natural Attenuation



Thanks for your attention



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