**In situ** conditioning of dredging and mineral sludge

**Aim project**

To study and develop techniques for organic and inorganic sludges to increase the

- sedimentation, consolidation and dewatering of sludge by chemical and biological means to obtain a reduction in volume
- fixation/degradation of contaminants by chemical and biological means to obtain a reduction in leaching of contaminants

Sludges will be treated in ponds and *in situ*.

**Test sites and contaminants**

**Port of Antwerp**

- Area Zandvliet-Berendrechtlocks
- Zandwinningsput

**Old Fishing Harbour Zeebrugge**

**Nyrstar**

Contaminants: Oil, PAH, PCB, heavy metals

- Oil, PAH, Hg, TBT, heavy metals
- Heavy metals: Zn, Cd

**Research**

**Research Partners**

**Stabilisation and consolidation sludge by**

- Additives: Hardening of sludge by ureolytic bacteria and Ca

  \[
  \text{NH}_4^+ + \text{CO}_3^{2-} \rightarrow \text{NH}_3 \downarrow + \text{Ca}^{2+} + \text{CaCO}_3
  \]

  Bacillus Pasteurii
  Ureolytic bacteria

  Seepage consolidation test to study consolidation parameters of sludge

**Fixation/degradation of contaminants in sludge by**

- Microbial degradation

  Batch test to study microbial degradation of contaminants

- Additives

  Chemical oxidation or reduction of organic pollutants

  Molecular techniques to explore contaminant-degrading microbial populations in sludge

  Chemical fixation of inorganic pollutants

**Industrial partners**

Injection of additives to stimulate the consolidation of sludge and degradation/fixation of contaminants in ponds or *in situ* by:

- Soft Soil Injection System
- In line injection of additives
- Fracturing
- Cutter Suction Dredge

**Partners**

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