SedNet WP 4

DREDGED MATERIAL TREATMENT TECHNOLOGIES IN EUROPE

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Outline

- Introduction
- Overview of treatment chains
- Examples of treatment technologies
- Beneficial use
- Costs
- Conclusions and recommendations
Objectives of treatment

- Beneficial use
- Transformation into construction material
- Reduce volume for disposal
- Reduction, removal or immobilisation of contaminants
- Improve handling characteristics
SELECTION OF TREATMENT CHAINS

STEP 1: Preselection

- TYPE of dredged material
  - type and degree of contamination
  - sand & org. matter content

- PERFORMANCE of TECHNIQUES
  - PRODUCT REQUIREMENTS

STEP 2: CRITERIA

- ECONOMICAL
- ENVIRONMENTAL
- SOCIAL

all possible chains

Technical feasible chains

Preferred chains
Subaquatic CDF's

IJsselooog
23 million m³

Sandefjord
55,000 m³

200,000 m³
Marseille

Livorno
area 300,000 m²
capacity 1,600,000 m³
Ripening fields and sedimentation basins near Slufter

Volume
90 million m³
Biological techniques

bioreactor

landfarming
Dewatering techniques

lagoons

geotubes

filter press
Sand separation techniques

sedimentation basins

hydrocyclones
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**METHA**

- Dredged Material
- Stock basin
- Cutter with pre-screening
- Rotary screen (10 mm)

**Process**

**Classification**

- Hydro cyclones (63 µm stage)
- Hydro cyclones (20 µm stage)
- Upstream current classifier
- Sand Dewatering screen

- Sand
- Fine sand

- Vacuum dewatering belt
- Spirals

**Coarse fraction**

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METHA – Treatment Plant

Dewatering Hall

• Annual Throughput 1 Mio. m³/a
• Corresponding 300,000 t/a dry matter silt

• In operation since 1993

• Investment 70 Mio. €
• Operation 6 Mio. € / year
• Staff 92
Silt Mound Disposal Feldhofe

- Disposal capacity: 20 million m³
- Area: 79 hectares
- Final height: 38 m above ground
Chemical immobilisation and stabilisation
Biogenesis soil washing
Thermal immobilisation  Ceramic Processing
Construction, covering and sealing
Construction materials from dredged material
Constraints beneficial use

- In general higher costs of treatment compared with disposal
- Lack of markets for products as secondary raw materials
- Limitations for beneficial use due to standards for the products
- Low awareness to consider treatment and reuse and/or acceptance of products
- No guaranteed or continuous supply for treatment to justify high investments by private sector
Measures to encourage beneficial use

- Adapt standards on building materials
- Certify quality of products
- Development of markets
- Link dredging projects to infrastructure
- Apply products in governmental projects
- Forbid disposal of easily treatable dredged material
- Improve perception on dredged material
- Subsidy on treatment & reuse
- Large-scale pilot projects
Large-scale treatment pilot NL

- European tender granted in medio 2004
- 2 contractors 1 NL and 1 from Belgium
- Volume 450,000 m³ contaminated dredged material
- Treatment into building materials and beneficial use of at least 50%
- Techniques: ripening, sandseparation and chemical immobilisation
- Project will be completed in 2009
- Results important for Dutch policy on treatment & beneficial use
Costs of treatment & beneficial use are site specific

- Scale
- Characteristics of dredged material
- Logistics
- Contract
- Legal constraints
Indication of treatment and disposal costs

Costs in €/in situ m³

- relocation
- subaquatic CDF
- upland CDF
- sand separation
- landfarming
- lagooning/ripening
- mechanical dewatering
- stabilisation/chem. immo
- thermal immo/bricks/LWA
Conclusions (1)

- Technology is not the problem, but innovation that leads to more efficiency is welcome
- Mainly low tech methods are operational
- Advanced treatment has only been done on a small scale
- Treatment is done mainly for optimisation of disposal
- Markets for beneficial use is the key problem
Conclusions (2)

- Scale, logistics and legislation are important cost factors
- Treatment is in general more costly than confined disposal, but in some cases treatment can compete with disposal
- Confined disposal remains necessary option
- CDF’s can be a environmentally sound solution
- Treatment and confined disposal can be complementary options
Recommendations (1)

- Treatment is only useful if it leads to:
  - beneficial use that is economically feasible
  - less disposal or less disposal costs
- Treatment & beneficial use need to be demand-driven additional to be driven by legislation
- Treatment & beneficial use need encouragement by financial incentives
Recommendations (2)

- Large-scale pilots are useful to gain experience on large-scale application of technologies, logistics, costs and market potential
- Involve the public and stakeholders
  - Communication on the actual risks
  - Dredged material is resource instead of waste
- Realistic and tailor-made solutions are needed
Thank you for your attention