Dredged Material
Treatment and Disposal Facilities

SedNet Special Session:
Managing the Elbe Estuary

9th October 2009
Dredged Material Management

Avoidance

Harbour

Dredging Service

Relocation

Treatment

Disposal

Beneficial Use

Dewatering Fields

Francop

Feldhofs

Effluent

Sand and Sealing-material

Ceramic Products
Sites for Dredged Material Treatment
Why Need We Dredged Material Separation?

- Cadmium
- Copper
- Lead

Heinz-Dieter Detzner

Hamburg Port Authority
Treatment – Dewatering Fields Moorburg
Operation Principle of the Dewatering Fields

- Area size of dewatering fields: about 100 ha
- Field size: 2 - 4 ha
- Annual throughput: 200,000 – 300,000 m³
Operation of the Dewatering Fields

Handling of the material in the beginning of the process

Dewatered Material ready for beneficial use or disposal
Treatment – METHA Plant
Principle Flowsheet of the METHA Plant
- Sorting and Separation

Dredged Material
- Stock basin
- Cutter with pre-screening
  - Rotary screen (10 mm)
- Coarse fraction
- Sand
- Fine sand

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

Hydro-cyclones (20 µm stage)
- Spirals
- Vacuum dewatering belt
- Vacuum dewatering belt
Main Components of the METHA Plant  
- Sorting and Separation

- Rotary screen (10 mm)
- Hydro-cyclones (63 µm)
- Hydro-cyclone (20 µm)
- Spirals
- Upstream current classifier
Principle Flowsheet of the METHA Plant  
- Dewatering

Thickener → Agitated stock tank → Dewatering 1st stage Screen belt press → Dewatering 2nd stage High pressure belt press → Silt
Main Components of the METHA Plant
- Dewatering

- Membrane chamber filter press
- High pressure belt press
- Filter belt press
Facts and Figures of the METHA Plant

- Development of the technology: 1987 - 1992
- Commissioning: March 1993
- Annual throughput: about 900,000 m³ ≈ 450,000 t_DS
- Investment costs: about 70,000,000 € (1993)
- Operation costs: about 13,000,000 €/a
  - 3,800,000 €/a (Process)
  - 4,000,000 €/a (Staff)
  - 5,000,000 €/a (Depreciation & Debt Services)
- Staff: 96 employees

Until today the METHA plant is the largest dredged material treatment plant worldwide
Sites for Dredged Material Treatment
Disposal – Francop Disposal Site

- Area size: about 100 ha
- Total capacity: 9,000,000 m³
- Annual capacity: 200,000 – 400,000 m³
- Installation Operation: until 2013
- Continued use: Public Park
Disposal – Feldhofs Disposal Site

- Area size: about 80 ha
- Total capacity: 9,000,000 m³
- Annual capacity: 400,000 m³
- Installation Operation: until 2025
- Continued use: Public Park

2007
Construction Principle - Francop Disposal Site

Surface Sealing and Cover System
Alternating Layers of Silt and Sand
Base Sealing
Intermediate Sealing
Edge Support
Old Flushing Field
Clay

500 m
38 m
Construction Principle - Francop Disposal Site

Edge Support Structure with Drainage System

- Control Shaft with Circle Pipeline
- Drainage Layer
- Shaft
- Edge Support
Construction Principle - Francop Disposal Site

Surface Cover System
- Cultivable Soil
- Drainage Layer
- Upper Sealing (3 Layers of Silt)

Base Sealing
- Drainage Layers
- HDPE-Liner 2.5 mm
- Base Sealing (3 Layers of Silt)
Dredged Material - Beneficial Use

Refilling of harbour basins

Leight weight pellets

Bricks

Dike construction
Thank you for your attention!

Contacts

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