

SEDIMENT TREATMENT IN HAMBURG

AS PART OF A CIRCULAR ECONOMY



© HPA, Foto Henrich Röper

SedNet Conference Dubrovnik, 04.04.2019
Dr. Henrich Röper, Heinz-Dieter Detzner, HPA

01

A strategic framework for
sediment management

02

A circular economy for sediments?

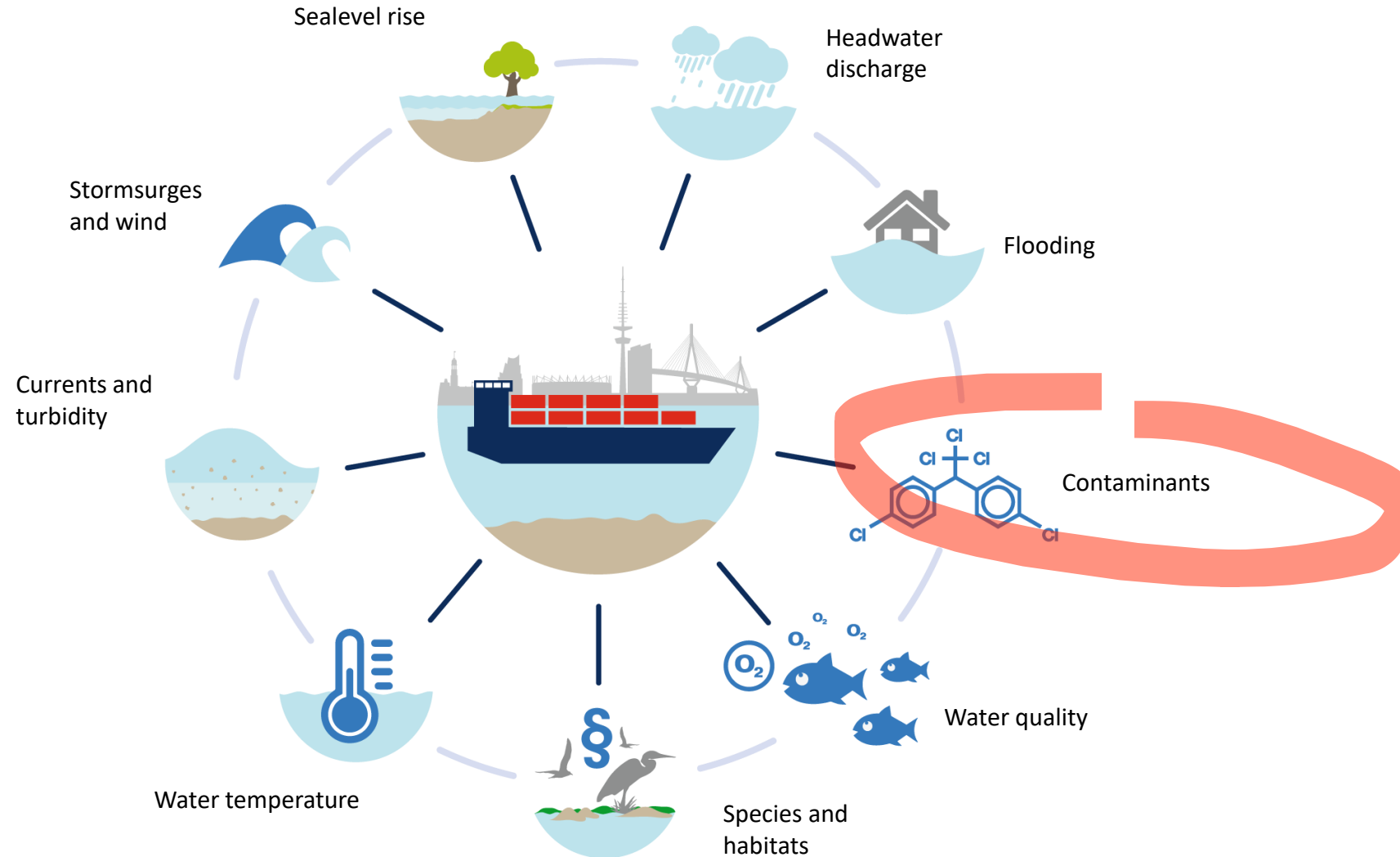
03

The „Big Five“

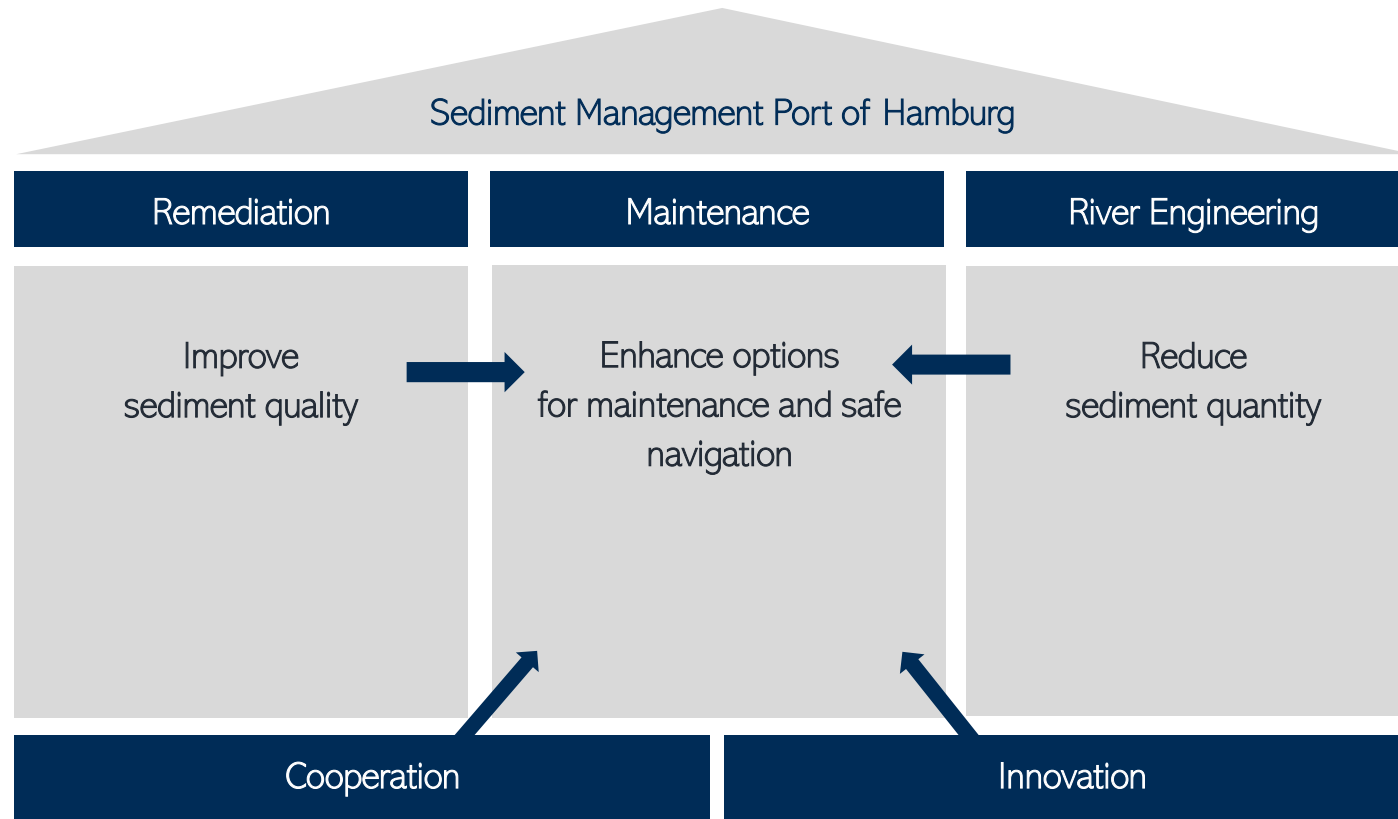
01

A strategic framework for
sediment management

Influencing Factors



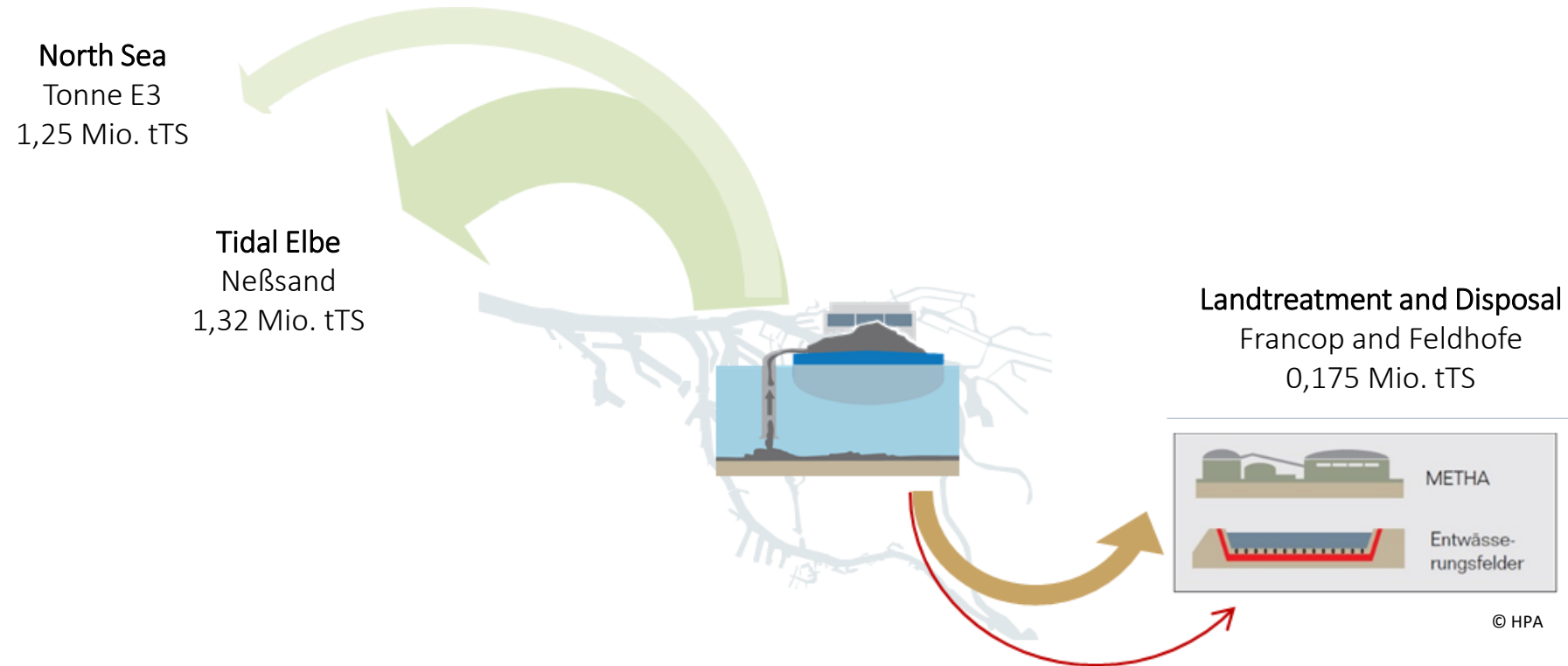
A strategic framework for sediment management



02

A circular economy for
sediments?

Sediment fluxes in 2018 – Port of Hamburg



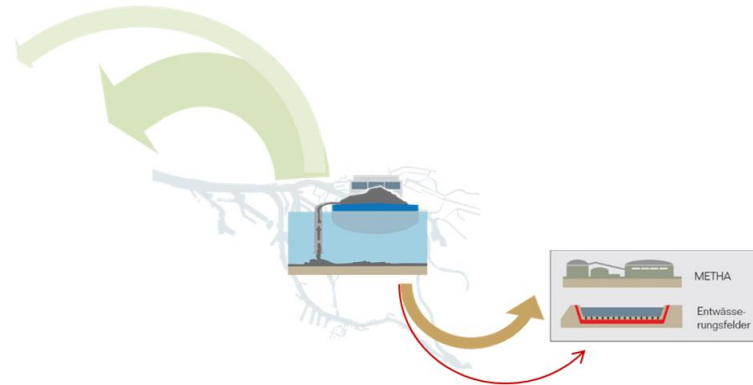
Possible options?

Engineering measures in the Elbe estuary

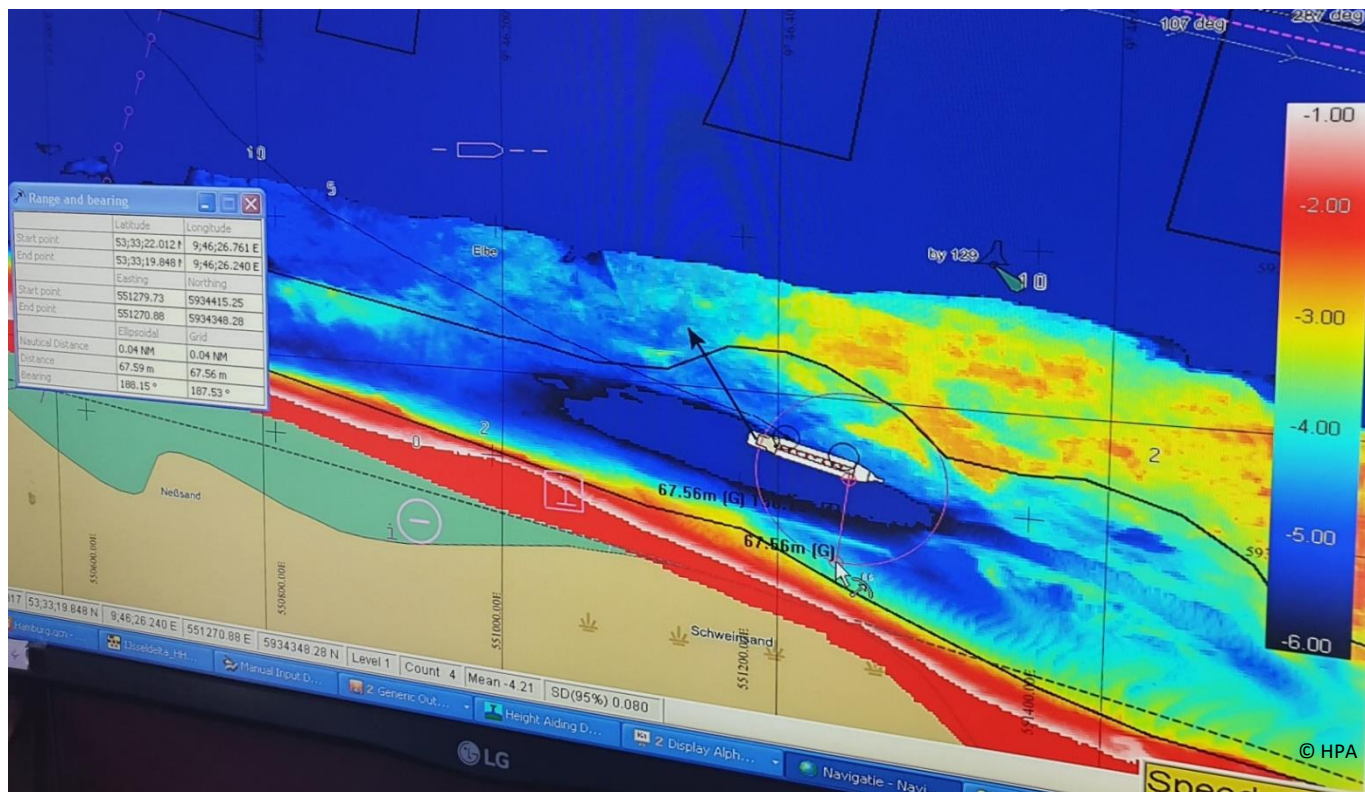
- influencing the sedimentaion dynamic
- coastal protection
- habitat restoration

acceptance
↓

Sediment quality



Habitat restoration in shallow waters with sediments from maintenance



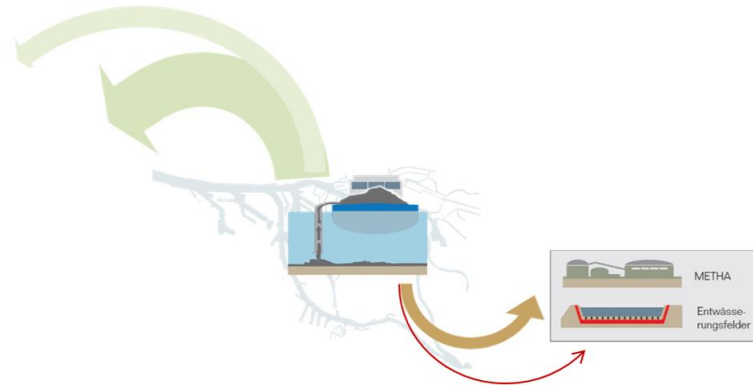
Possible options?

Engineering measures in the Elbe estuary

- influencing the sedimentaion dynamic
- coastal protection
- habitat restoration

acceptance ↓

Sediment quality



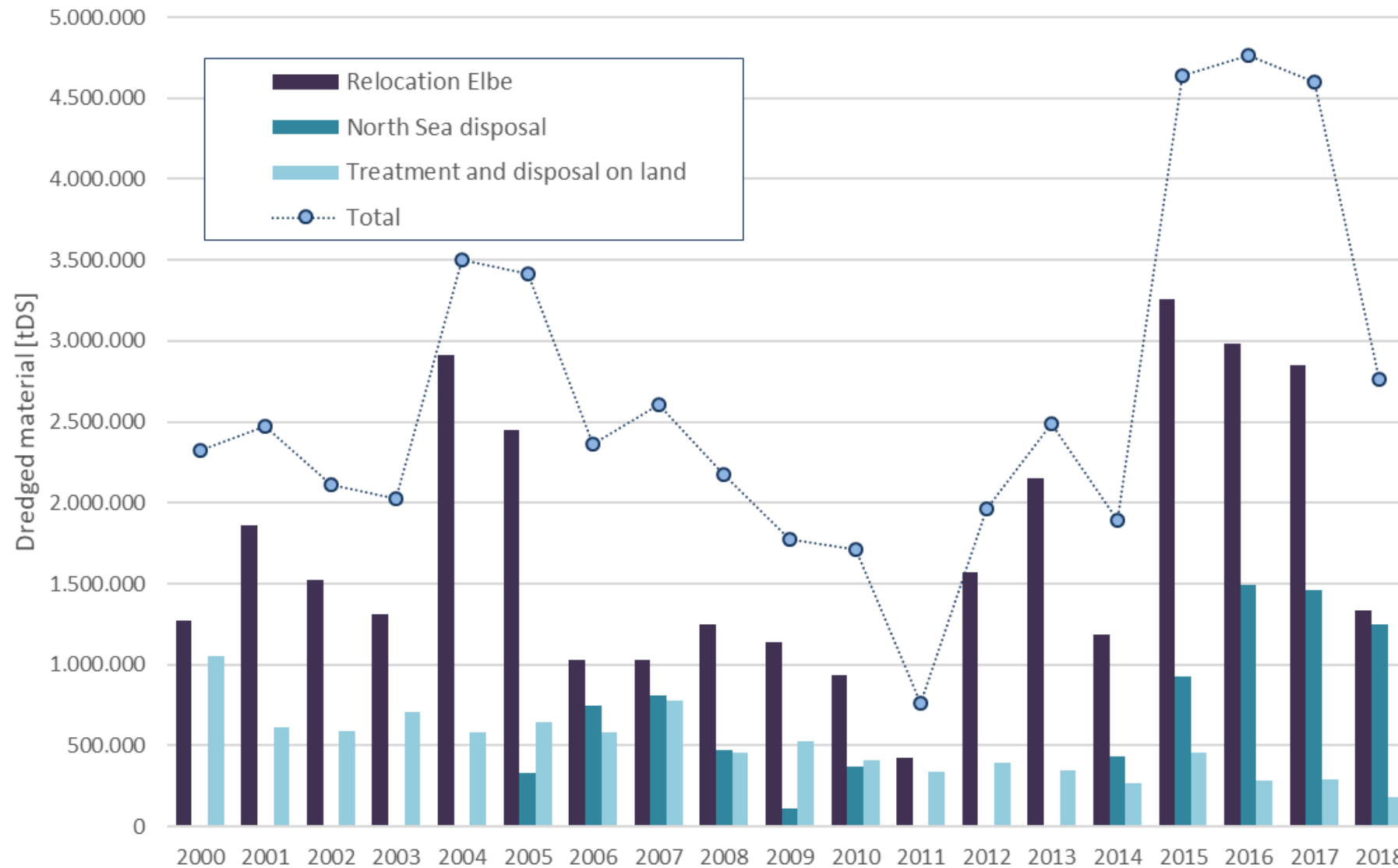
Treatment and processing to meet product requirements

- substitute of raw materials
- industrial uses
- costumized production

acceptance ↓

Economic potential

Dredged material amounts: Port of Hamburg (2000 – 2018)





⇒ Sediments are eligible to circular economy thinking

03

The „Big Five“ Beneficial Use Options

| Sand Dewatering Flumes - Ellerholz



- Operation phase since 2000
- Annual throughput up to 450,000 m³/a

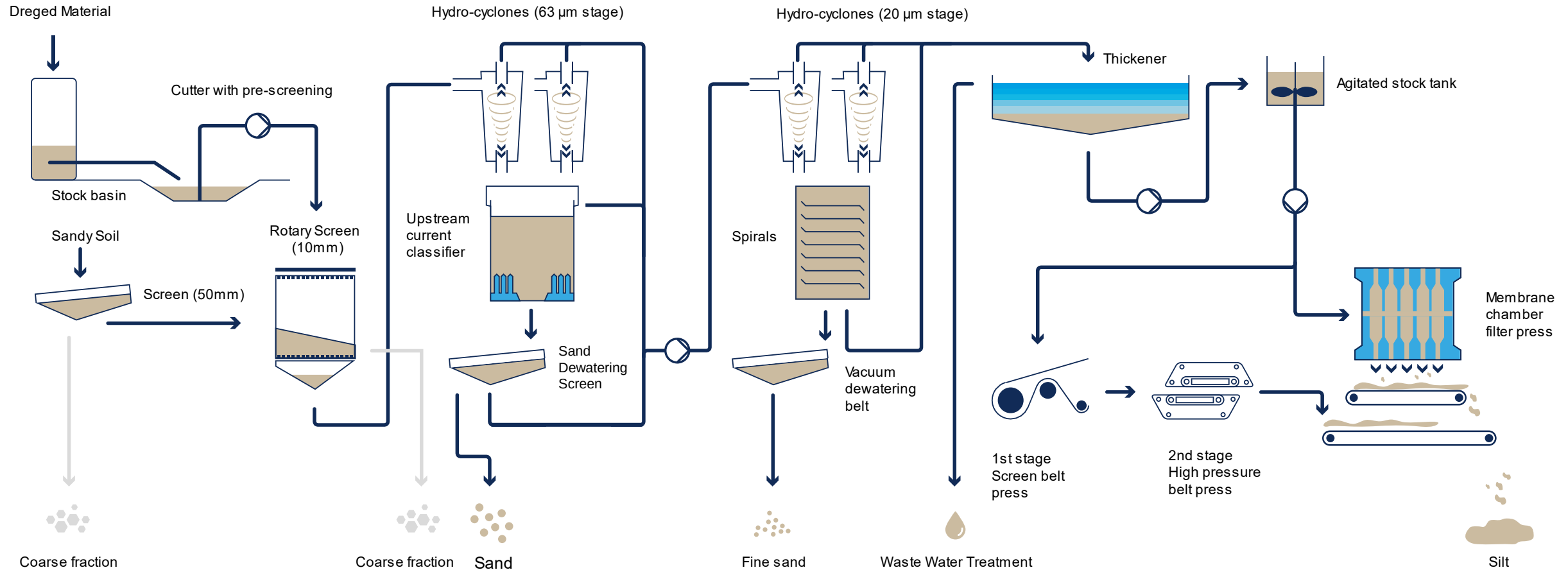
© HPA

Dredged Material Treatment Plant - METHA



- Operation phase since 1993
- Annual throughput up to 550,000 m³/a

Operation Principle of the METHA

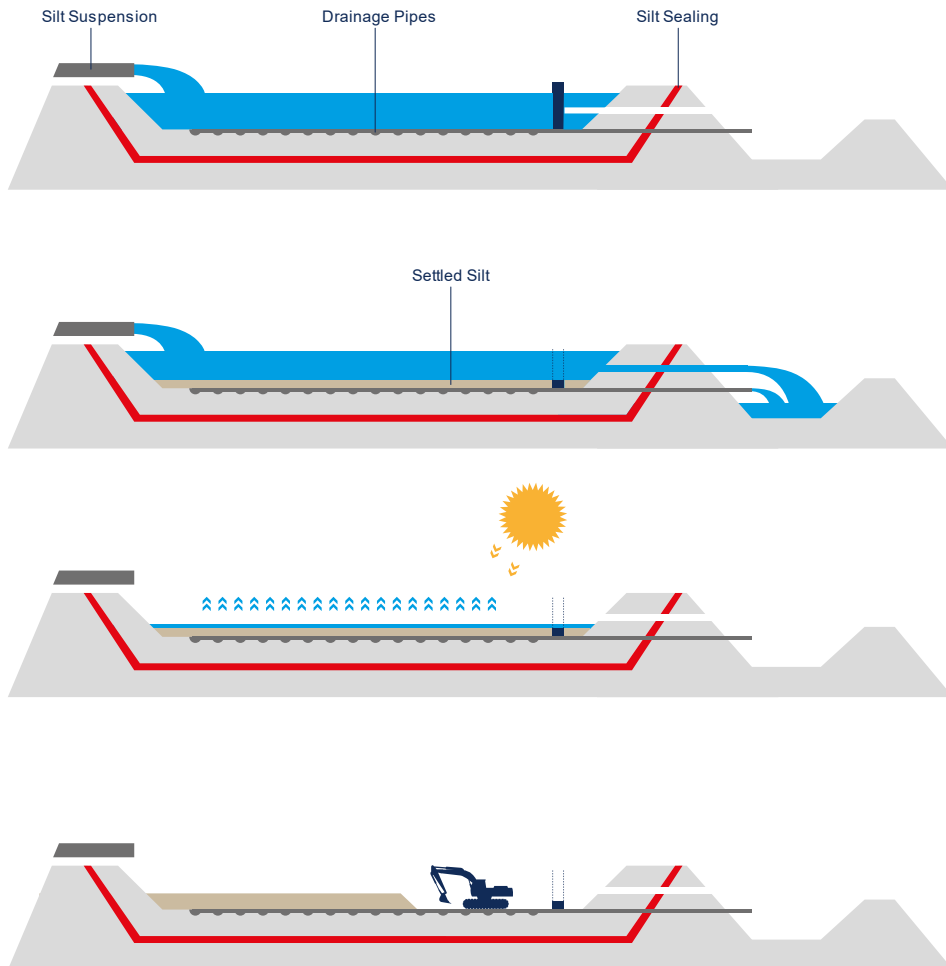


DM Treatment - Dewatering Fields Moorburg



- Area size of dewatering fields: about 100 ha
- Field size: 2 - 4 ha
- Throughput capacity: up to 250,000 m³/a

Operation Principle of the Dewatering Fields



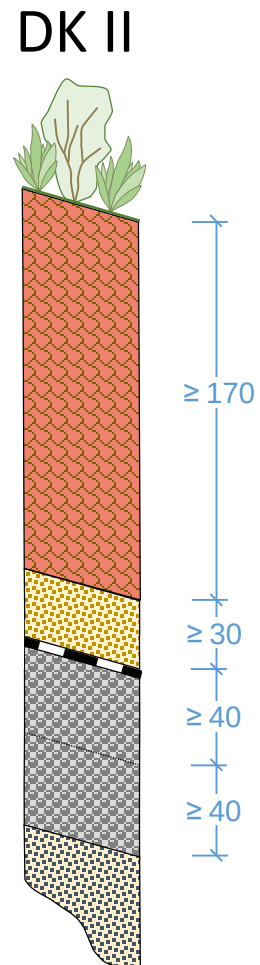
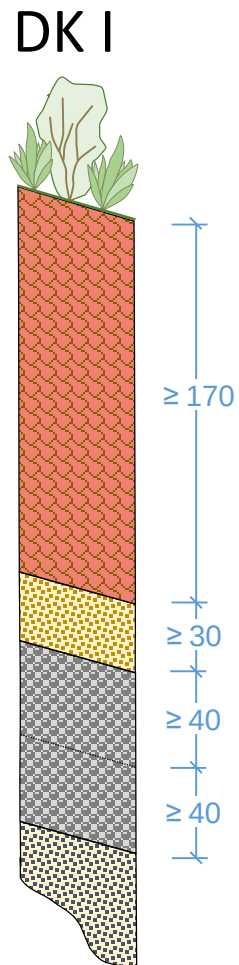
- Filling of dewatering fields
- Remove Supernatant water
- Natural dewatering by sun and wind
- Remove and transport to final use

II DM as sealing material on disposal sites



- Disposal site
Feldhofe
- Capacity
7,000,000 m³ DM

DM as sealing material on disposal sites



Legend



Planting



Recultivation layer



Drainage layer



HDPE sealing membrane



Dredged Material sealing layer



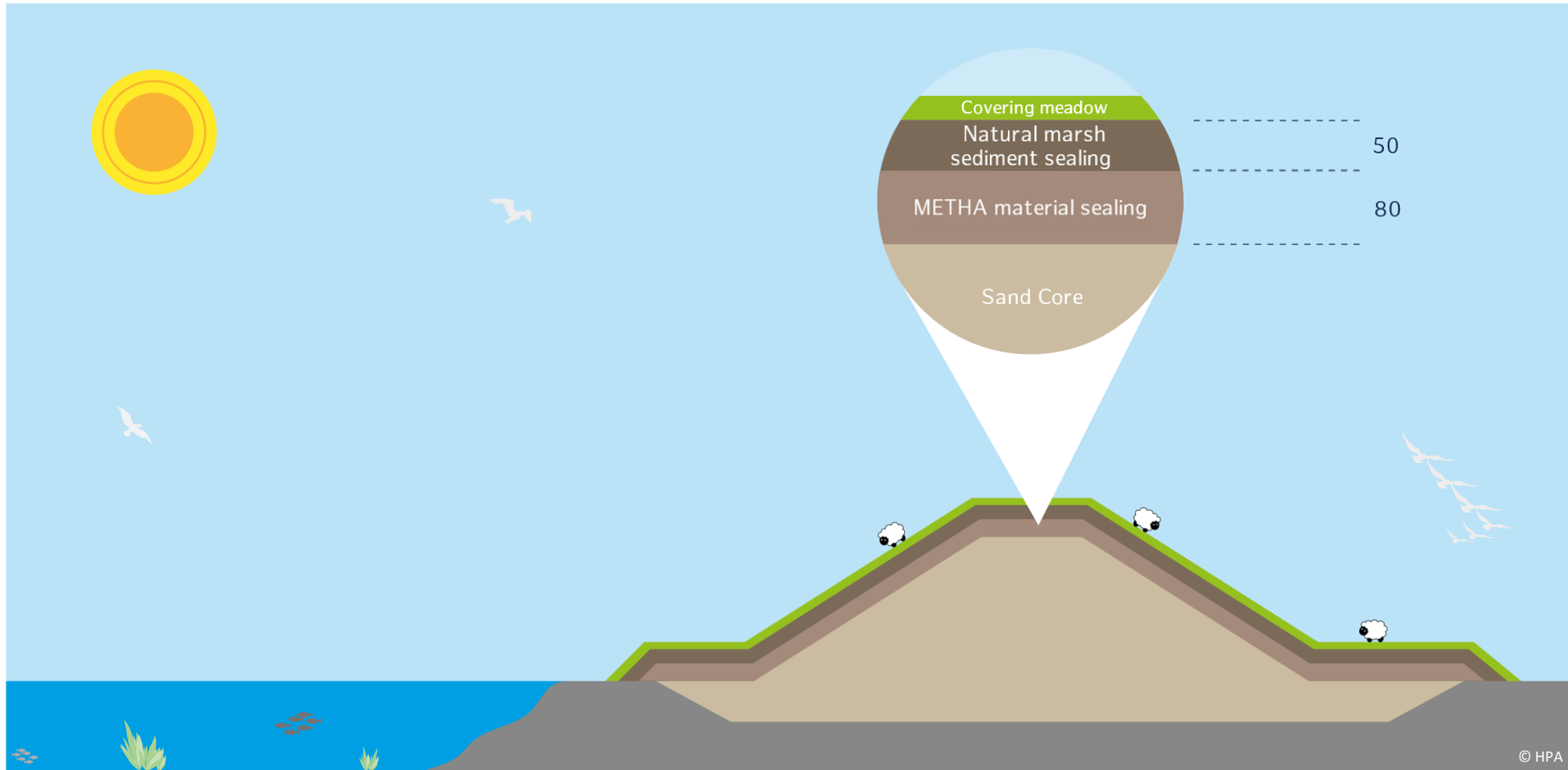
Gas drainage layer

III DM as clay substitute in dike construction



- Pilot dike construction using METHA Material below a layer of natural marsh sediment at Ellerholzkanal, Hamburg
- Built in 2004

III DM as clay substitute in dike construction

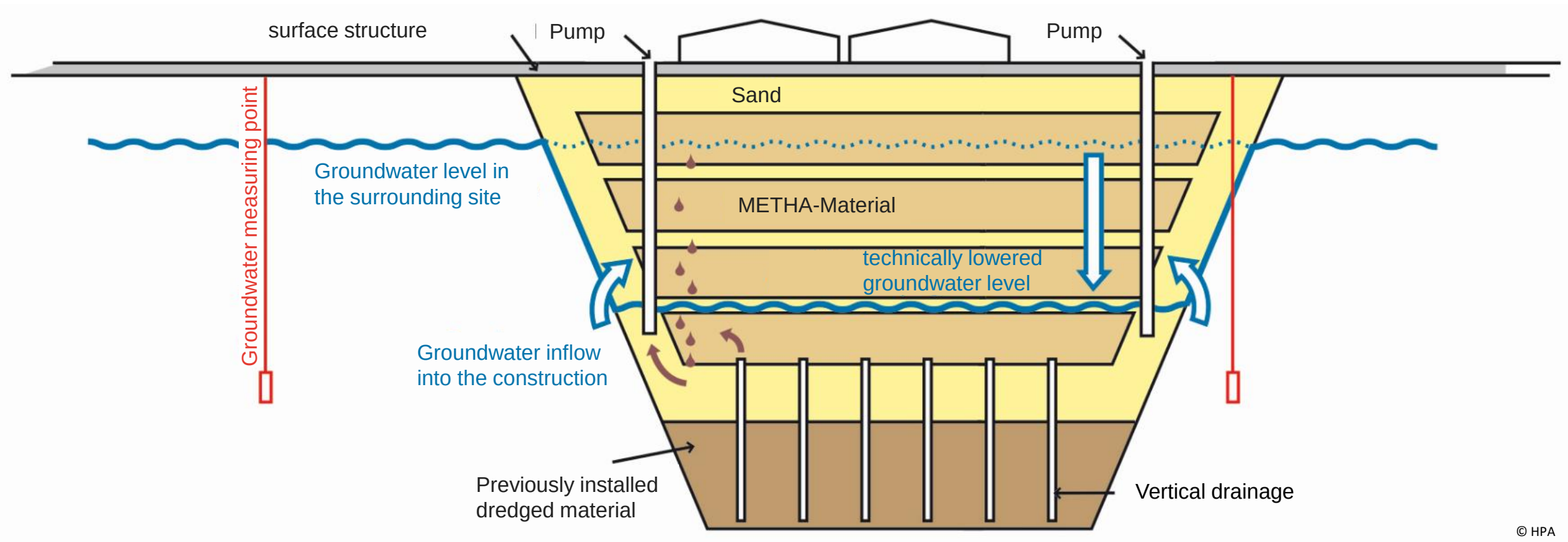


IV Silty and sandy DM in backfilling measures



- Area: 8 ha
- 290,000 m³ METHA-Material
- 420,000 ³ Sand
- Target Hight: + 8.00 m
- Built in 2013 - 2016

IV Silty and sandy DM in backfilling measures



© HPA

V Silty DM material in the ceramic industry



Pilot
Brickyard
Hamburg



Leightweight
Aggregat Production





© HPA-Bildarchiv, Andreas Schmidt-Wiethoff

Dr. Henrich Röper

Waterside Infrastructure

Strategy and innovation

Tel.: +49.42847.2481

Henrich.Roeper@hpa.hamburg.de

Heinz-Dieter Detzner

Waterside Infrastructure

Land treatment and disposal

Tel.: +49.42847.2387

Heinz-Dieter.Detzner@hpa.hamburg.de

Hamburg Port Authority

Neuer Wandrahm 4

20457 Hamburg