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Drainage bags: an attractive alternative for the treatment of sludge and sediments

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Dredging of sediments



Mechanical



Mechanical

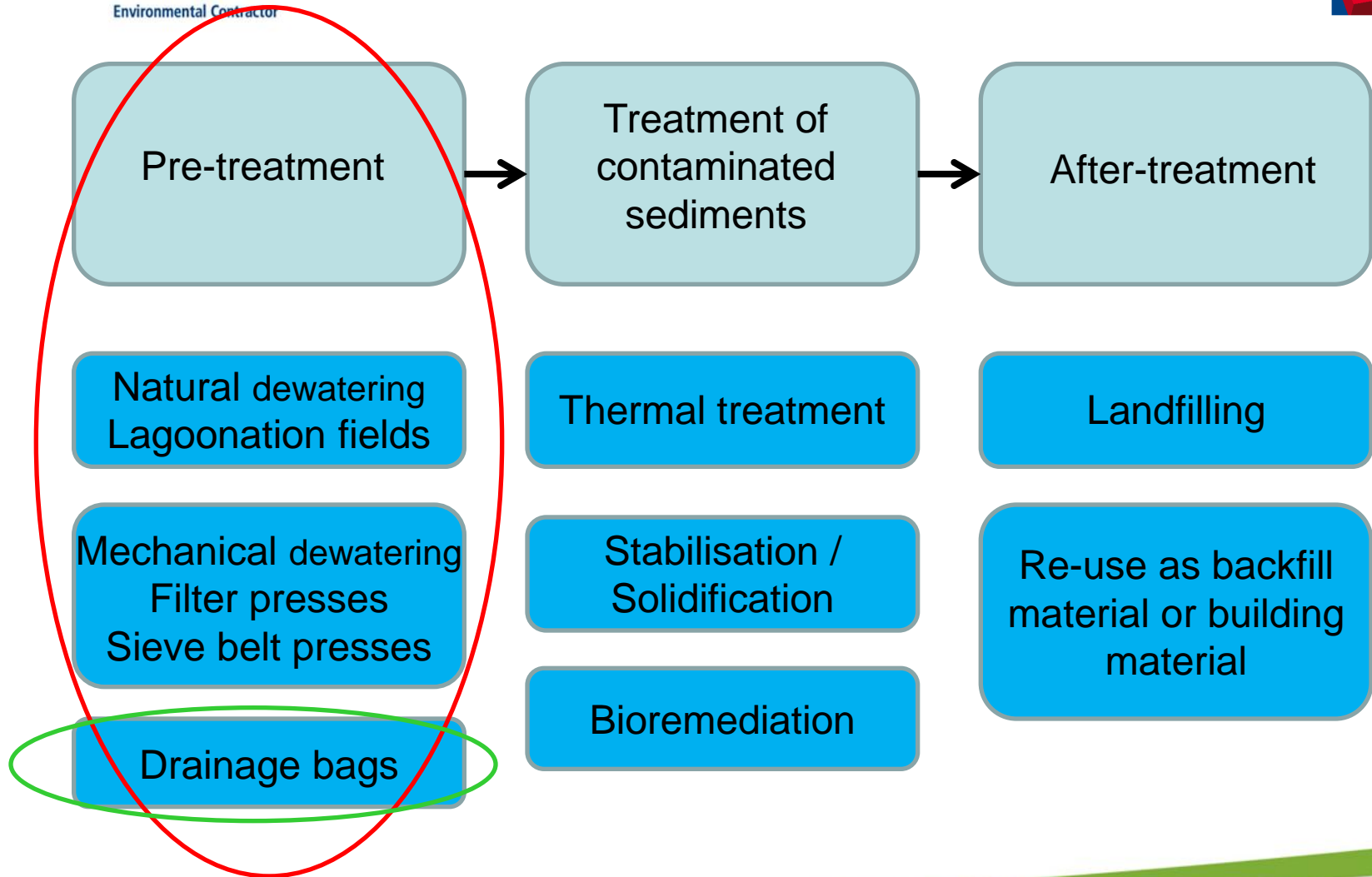


Hydraulic



Hydraulic

Dredging of sediments





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Pre-treatment of sediments

Natural and Mechanical Dewatering

Why to pre-treat?

A natural sediment contains in between 30 and 40% of dry matter. This figure can vary a lot with industrial sludge.

Depending of the used dredging technique, this amount can decrease to 10% (hydraulic dredging) or to stay almost stable (mechanical dredging)

The pre-treatment is the recovery of the initial state of the mud

Pre-treatment of sediments: dewatering

- Goals of dewatering:
 - Increase of landfill capacity
 - Enhancing the geotechnical properties of the sediments
- Ways to dewater sediments:
 - Natural
 - Mechanical
 - Drainage bags





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Natural dewatering of sediments

Enhanced natural dewatering through lagunation and wind rowing



Dewatering by lagooning



- Lagooning:
= separation of sand / fine fraction
 - Hydrocyclones
 - Separation fields
- Applied in our sediment treatment centres

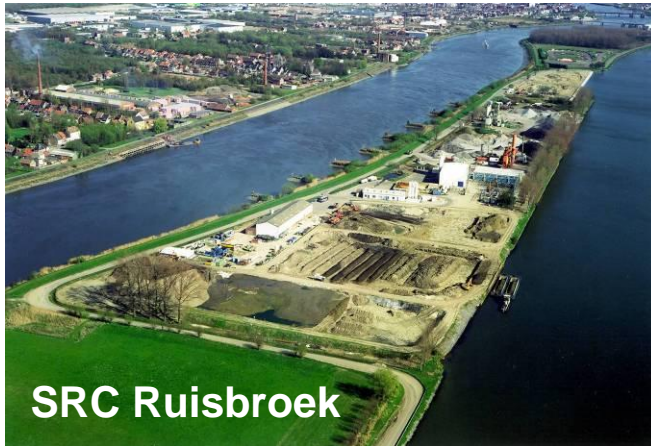




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Treatment centres for sediments



SRC Ruisbroek



SRC Krankeloon



SRC Zeebrugge



SRC Desteldonk



Dewatering by lagooning



- Sediments are placed in windrows
- Regularly turning makes water vaporise and leak out
- Process water is remediated with a water purification unit





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Mechanical dewatering of sediments



Mechanical dewatering



- Mechanical dewatering
 - Consolidation
 - Filter press
 - Sieve belt press

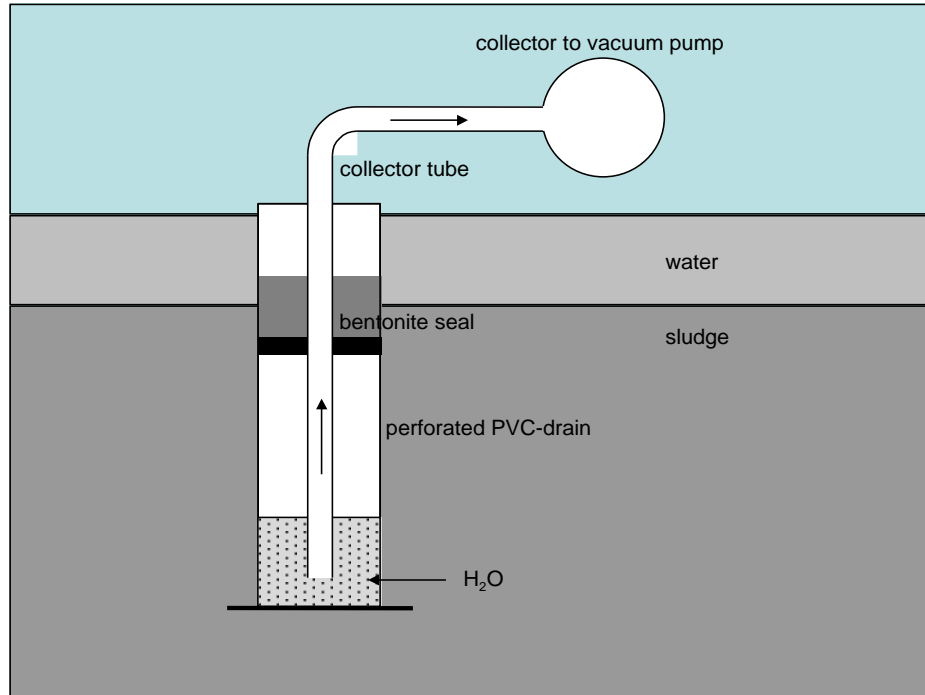




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Consolidation



- Vertical drains
- Horizontal drains





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Mobile dewatering unit



Clarifiers



Clarifiers

Mobile dewatering unit





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Filter press





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Sieve belt press





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Dewatering by drainage bags



Dewatering by drainage bags



The drainage bag is a huge pocket of permeable geotextile that allows storage of sludge on land for their dehydration and subsequent management



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DEC – Hultsfred (S)



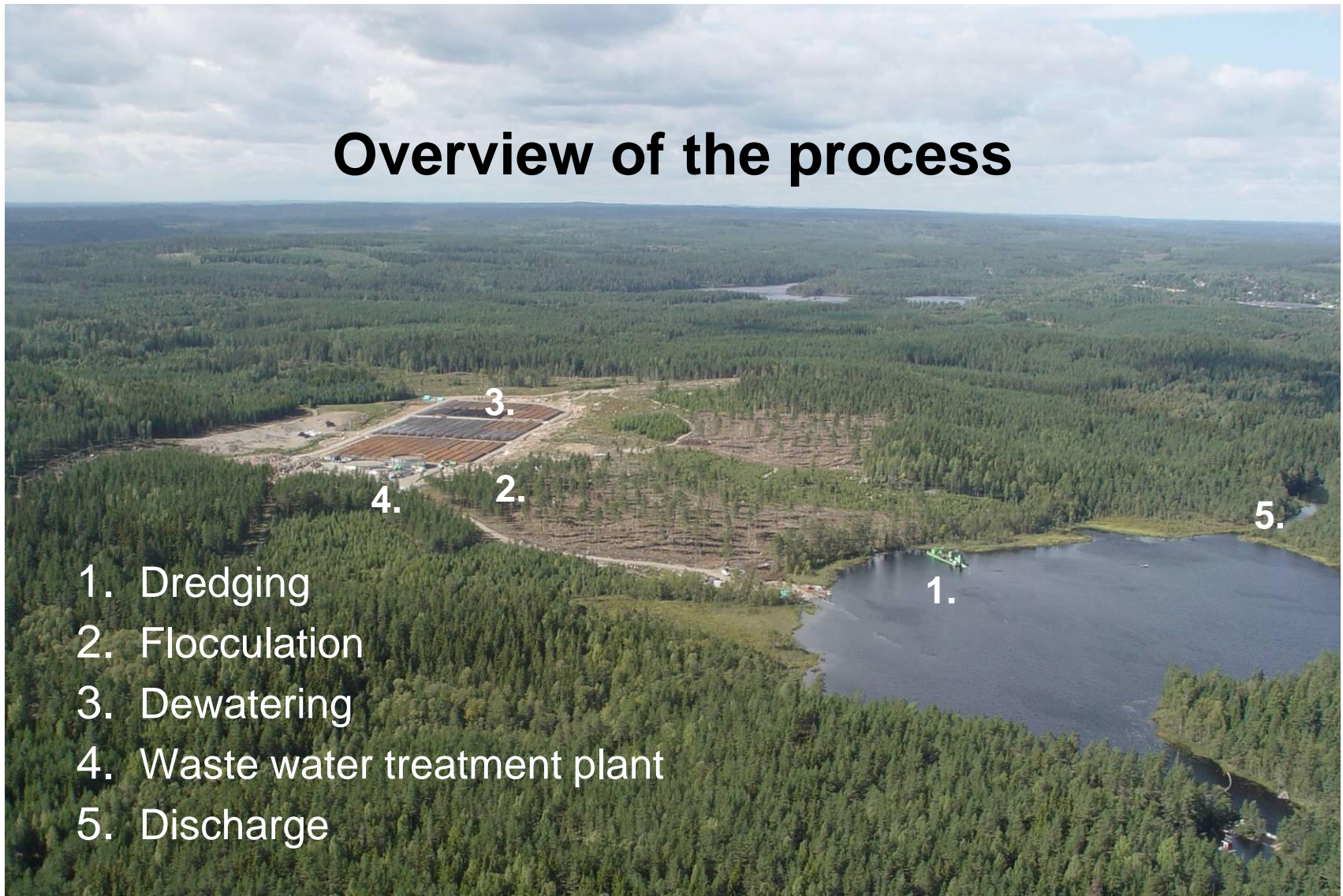
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Dewatering by drainage bags: How does it work?

Overview of the process



1. Dredging
2. Flocculation
3. Dewatering
4. Waste water treatment plant
5. Discharge



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Construction of the storage site





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Construction of the storage site





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Flocculation





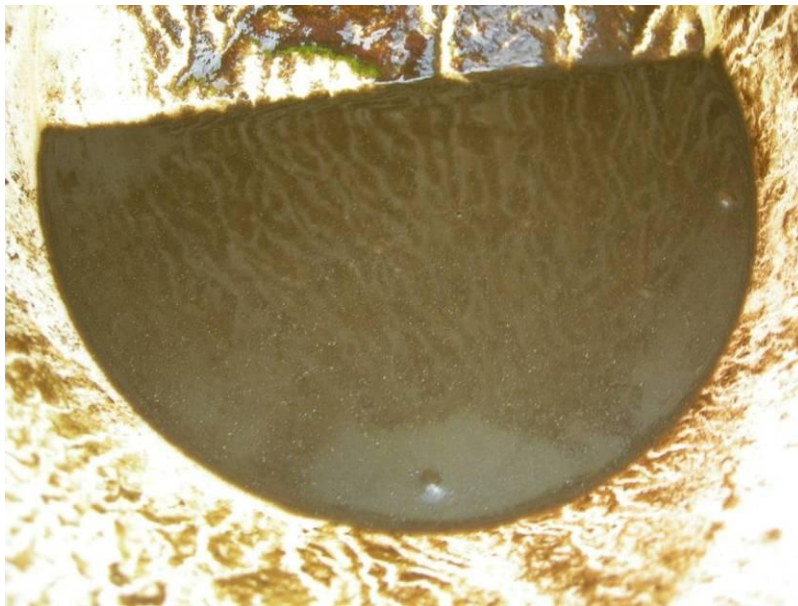
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Flocculation



Before dosing flocculants



After dosing flocculants





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Dewatering by drainage bags





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Dewatering by drainage bags





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Waste Water Treatment Plant





Dewatering by drainage bags



The implementation of this technique is preferred in the following cases:

- When the technical or economic constraints do not make mechanical dehydration possible, especially via chamber filter press or screen belt press
- Where there is sufficient room for storing bags that can be left in place a few months while they dewater.



Extract Ecoterres – Honfleur (F)



Extract Ecoterres – Tilly (B)



Dewatering by drainage bags

At the end of the operation and when material is dewatered enough, there are two options:

- Either the bags are opened and dewatered sludge - which is become shoveled - are transported in a waste disposal facility;
- or the bags are left in place. The area can then be converted by the addition of topsoil and grass seeding or covered with various plantations.





Conclusion



As long as this technique is implemented by experienced teams, sediment management on land by the use of drainage bags has many advantages. They include:

- Its application to natural mud, but also to many types of industrial sludge
- Costs of implementation is competitive by savings mobilization / demobilization costs of bulkier materials, such as mechanical dewatering plant
- A possible value of sand fractions contained in the material





Conclusion



- A control of sudden break in rhythm by the implementation of an online flocculation
- The fact that drainage bags play two roles simultaneously: one as a sludge or sediments container and that the second as a filter media
- The odor management. Indeed, the storage bag contributes to the non-odor dispersion in the environment
- Control of the waste water quality.



Extract Ecoterres – Fessenheim (F)



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Thank you

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