

Guardians of the Reservoir Competition Information for WEDA

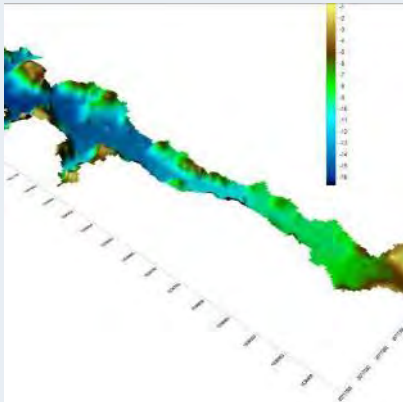
(Western Dredging Association)

Dr. Michael Detering

May 12, 2021

Cost efficient and permanent solution of sedimentation problems

Areas of work:



Consulting, Analysis,
Bathymetry



Sediment Solutions
of any size



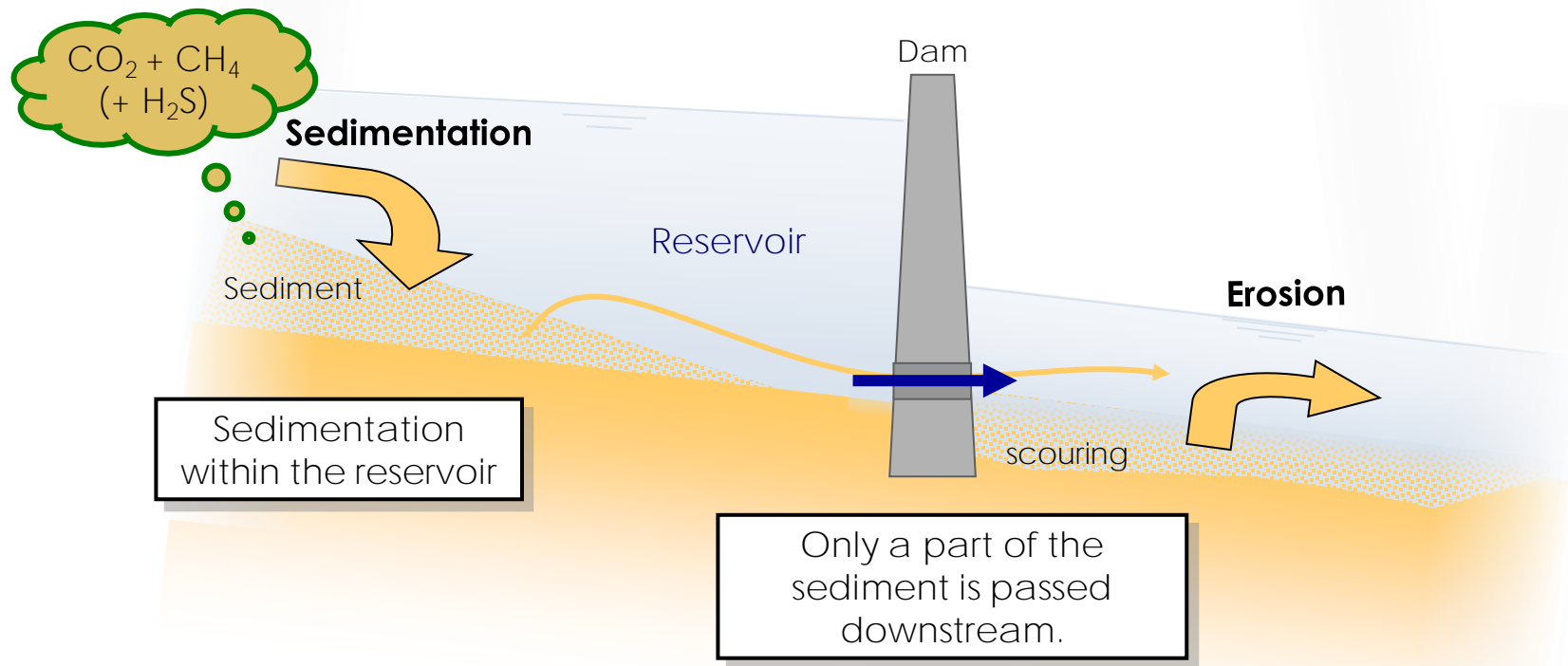
Research &
Development



Trainings &
Assessments

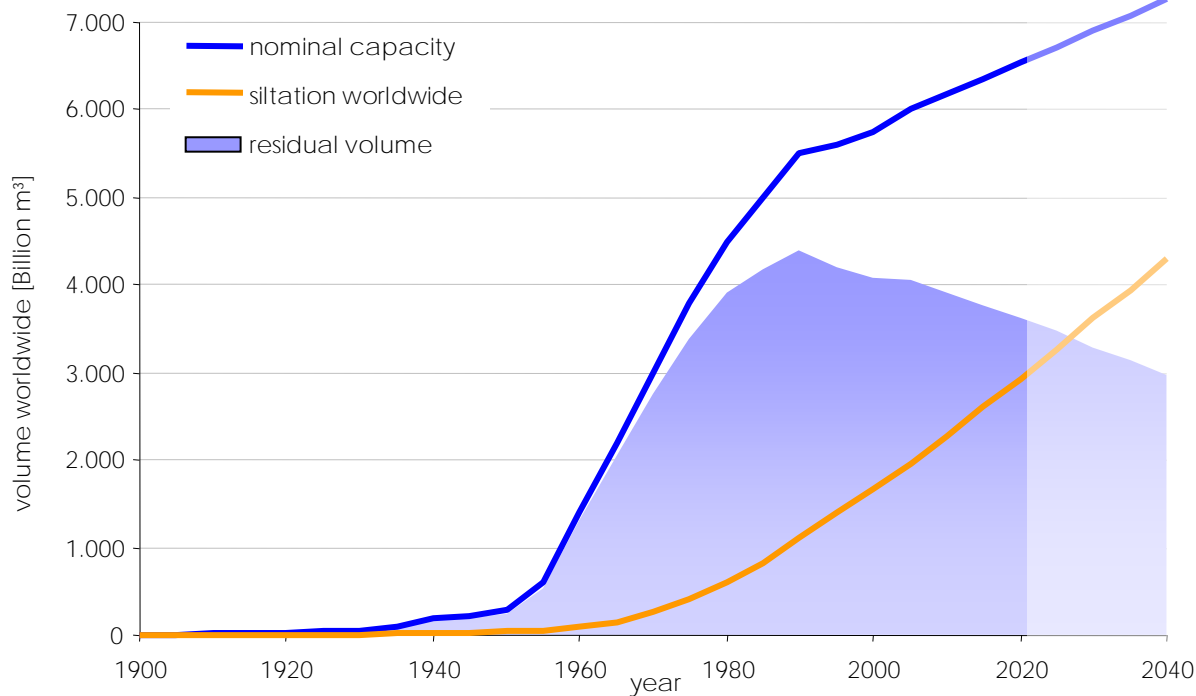
Dams/Reservoirs have been built for good reason, but cause massive changes in hydro morphology.

1. Reservoirs hold back sediment, thus reduce their own usable capacity.
2. Sediment is missing downstream, causing erosion and other damages.
3. Green house gas emissions are becoming an additional issue.



Basics

Siltation of Reservoirs



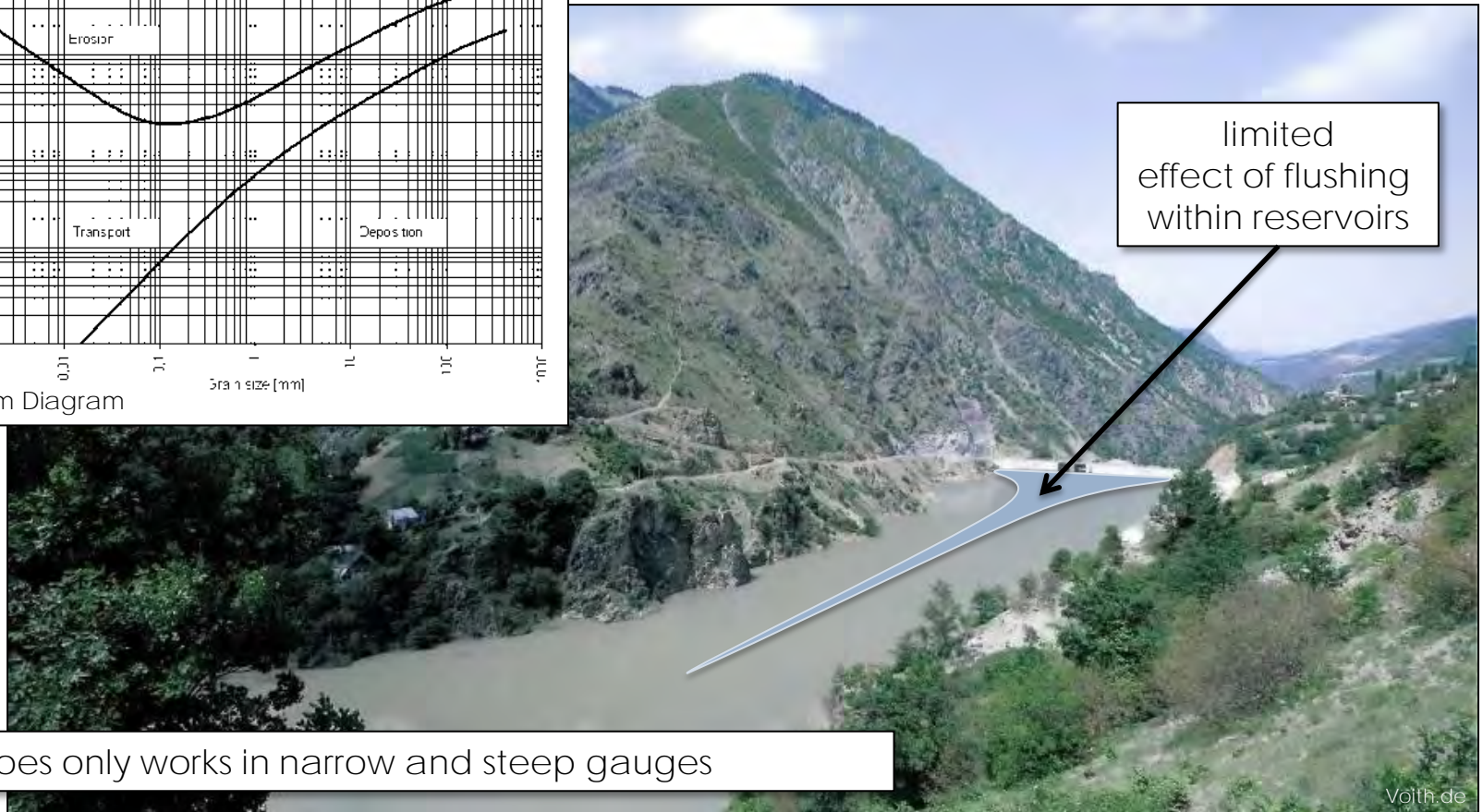
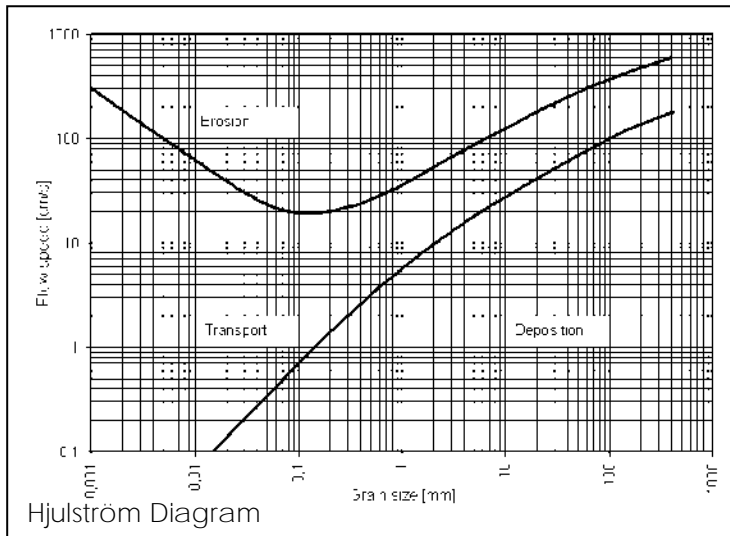
worldwide more than 200,000 reservoirs, thereof more than 45,000 large dams

Weltbank: “Last century was used to build reservoirs. This one will be used to solve sediment problems.”

sources: D-Sediment; Jolanda Jenzer, Giovanni De Cesare: *Möglichkeiten und Anwendung einer Datenbank bezüglich der Stauraumverlandung von alpinen Speichern*, Wasser Energie Luft, 2006, Heft 3

Basics

May Flushing be a solution?



Basics

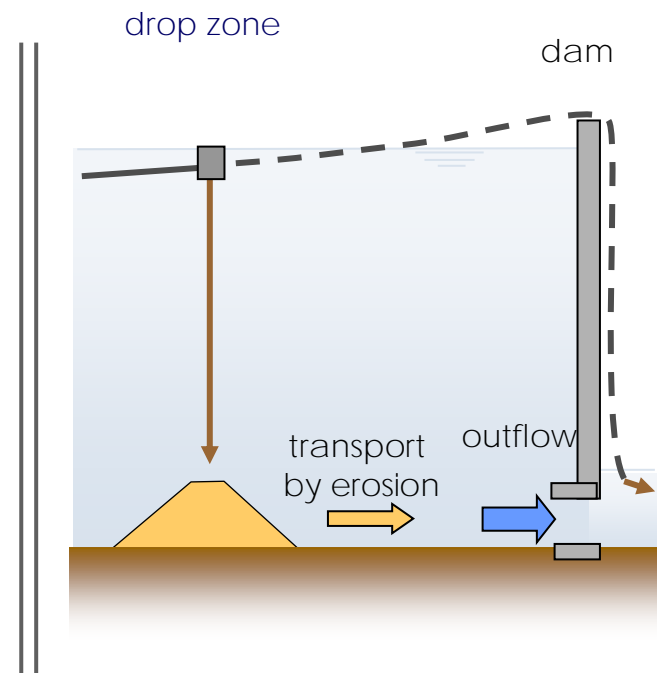
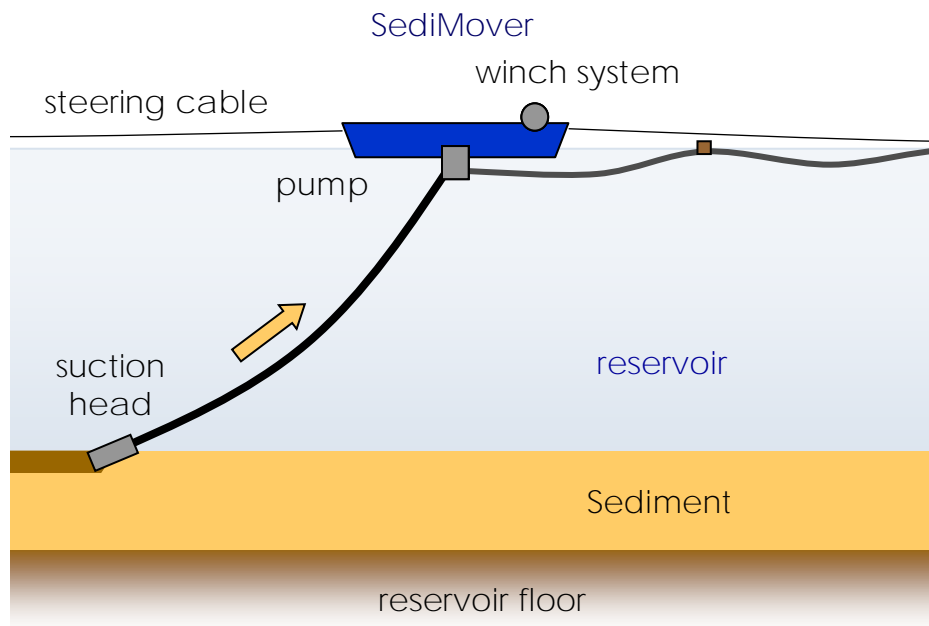
Downstream effects of flushing



Continuous Sediment Transfer

ConSedTrans – a near-nature solution

- Sediments are sucked in similar to suction dredging, but controlled, adjustable to downstream flow/transfer capacity and on a fully automated 24/7 basis. Dredging technology differs from conventional equipment.
- automated transfer to drop zone no harm to turbines – or direct downstream passage
- valid patent protection in the U.S. and other countries
- efficient, comparably small and virtually unlimited range by booster pumps



Sediment Transfer Equipment “SediMover”



- automated or manually operated equipment
- modular design
- easy to combine with other technologies

Sediment Transfer Technology Sample: Austria



Sediment Transfer Equipment “MiniMover”



- for shallow areas/reservoirs
- works even without GPS
- budget version
- easy to install
- works also in combination with other equipment

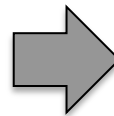
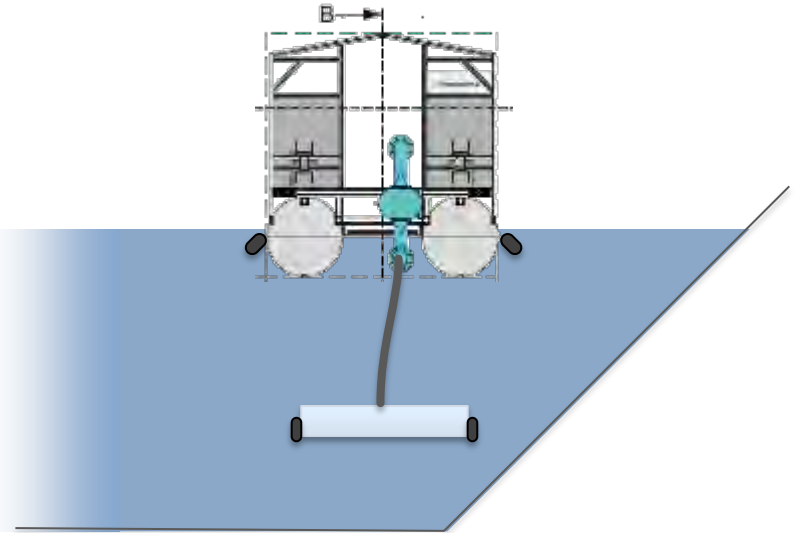
Guardians of the Reservoir - WEDA Proper dealing with challenges



- frequent floods with strong currents
- frequent dryfall (flood protection)
- heavily consolidated/dense sediment
- very shallow sections
- debris
- plant growth
- power limits
- difficult reservoir access
- booster pump due to transfer distance > 1 km
- remote site/long travel
- ...

Guardians of the Reservoir - WEDA different conditions to be considered at applications

- fine sediment
- limited/no debris
- steep banks
- concrete bottom/banks
- longitude shape
- booster pump yes/no
- dry fall/no foreseen dry fall



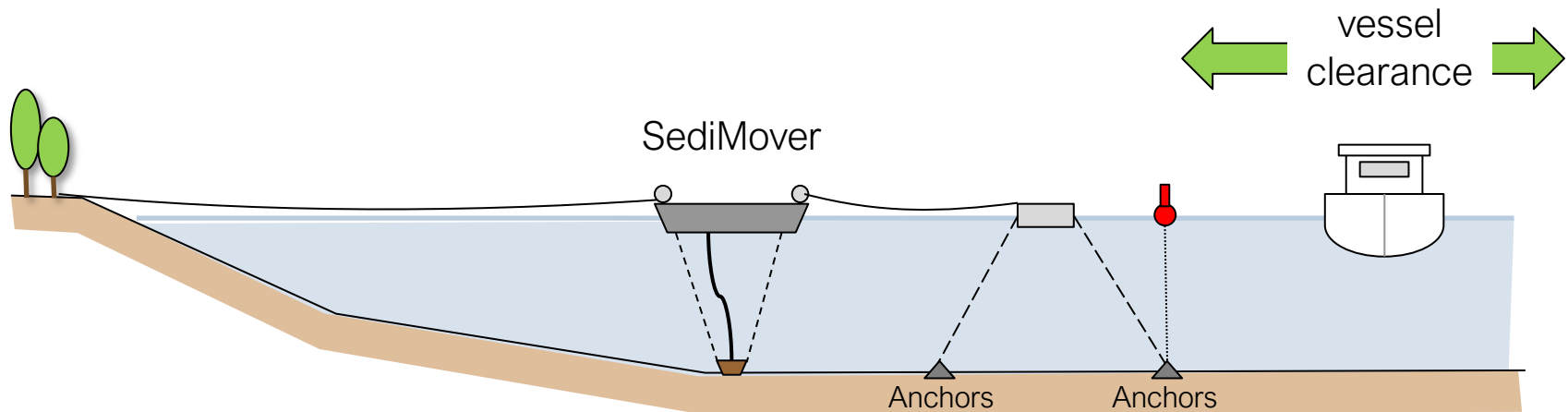
Guardians of the Reservoir - WEDA

Explaining technical details

Vessel positioning cables (1)

stretched across the reservoir (attached to anchors on both reservoir shorelines) would generally not be allowed where they would block recreation boats from traveling upstream and downstream. An anchor could possibly be attached to one shoreline, but boats would have allowed to pass upstream and downstream of the dredging area.

→ **explain**
that and how cabling is mountable without blocking passage (+optional future free float)

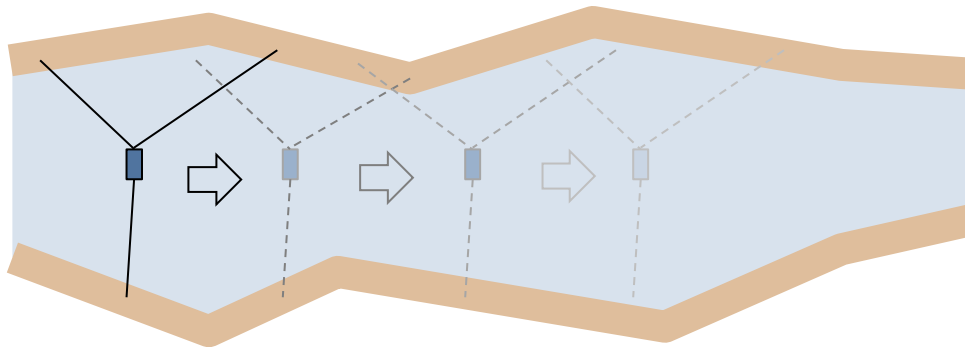


Guardians of the Reservoir - WEDA

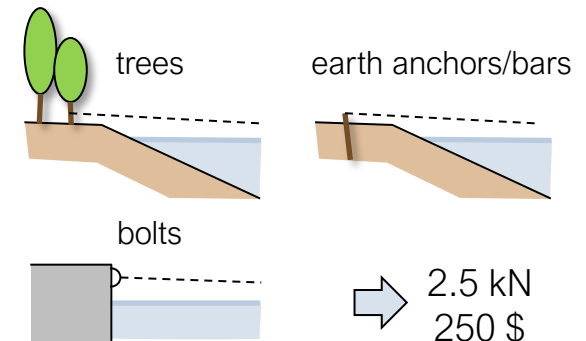
Explaining technical details

Vessel positioning cables (2)

Multiple anchor and cable setups may be required for large reservoirs.



→ *explain*
no problem, neither
technical nor cost



Debris

eventual need to consider debris management during operations

- ↳ type and level of debris differs between projects
- ↳ actual experience leads to a more robust design of suction head for self-cleaning

→ *outline*
limits and mitigations

Guardians of the Reservoir - WEDA

Other benefits of D-Sediment solution

Advantages

- Applicable to the removal of loose (unconsolidated) sediment + **consolidated sediment** depending on properties
- Ability to continuously remove sediment

→ *show application range*

→ *emphasize advantage*

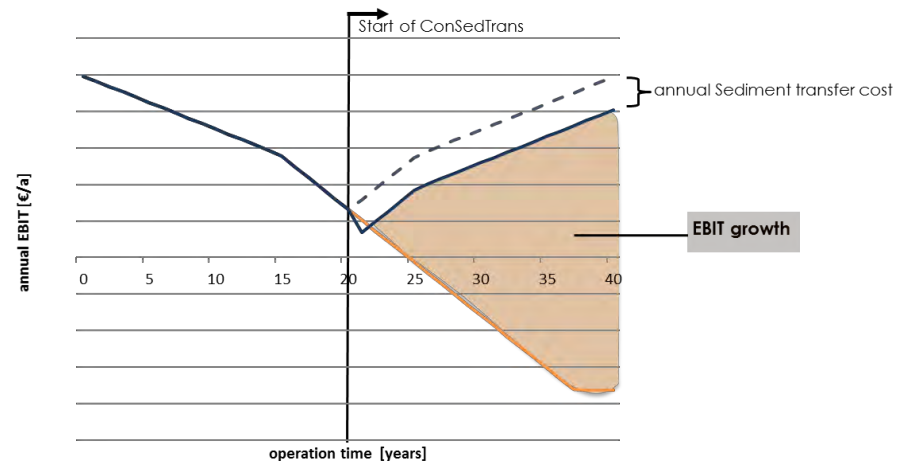
Novel

- automated continuous sediment transfer
- **online measurement & documentation** with optional interface to plant operation

→ *underline business benefit*



Gain back asset value:



Thank you



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