

# Beneficial Use of Contaminated Sediments: Strategy Considerations

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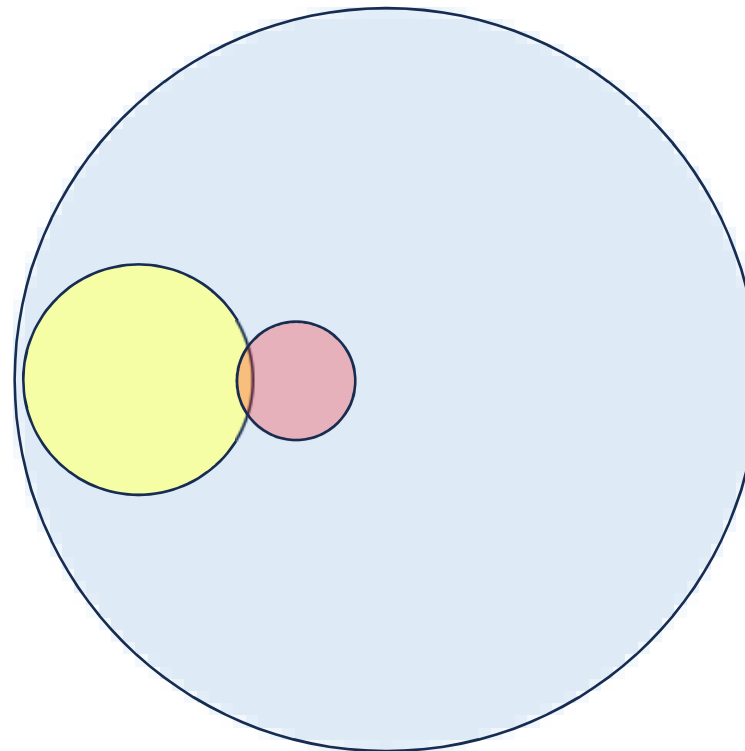
# Use Contaminated Sediment in Contained, Built Environment Applications

- Creating separate and distinct end uses for clean and contaminated sediment could streamline regulation, expedite beneficial use of both resources, and reduce costs.
  - Use clean sediment for natural environment applications
  - Use contaminated sediment for built environment applications
- Focusing on built environment applications:
  - Simplifies processing, raw material, and product specs
  - Creates opportunities to eliminate complete and significant exposure pathways
- Prohibiting disposal would create demand for processing capacity.

# EPA. 1998. Contaminated Sediment Management Strategy. EPA-823-R-98-001.

## Volume of U.S. Sediment by Category

- Sediment: approx. 12 billion cubic yards (upper 5 cm)
- Contaminated Sediment: approx. 1.2 billion cubic yards
- Dredged Material: 300 million cubic yards (annually)
- Contaminated Dredged Material: 3-12 million cubic yards (annually)



# Dewatering

- Dredge material is typically 15-20% dry matter (DM)
- Settling ponds yield ~25% DM
- Drying fields dewater by evaporation and drainage
- Foged et al. (2007) describe a process that can achieve 45-50% DM
- Achieving 60% DM yields low permeability material (hydraulic conductivity  $\leq 10^{-9}$  m/s) with good soil mechanical properties

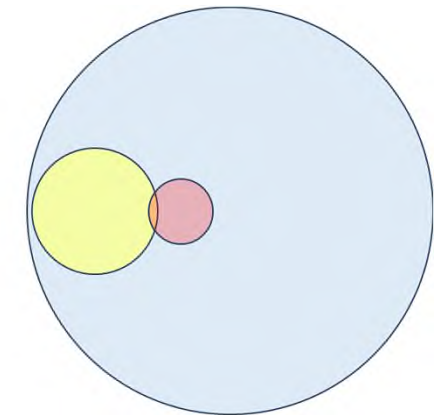
Foged S, Duerinckx L, Vandekeybus J. 2007. An Innovative and Sustainable Solution for Sediment Disposal Problems. WEDA Proceedings: 1513-1527.

# Overall Benefit of Sediment-Based Products

Product	Composition	Overall benefit*
Paving blocks	16% sediment	\$223/yd
Fill material	23-67% sediment	\$180/yd
Partition blocks	14% sediment	\$89/yd

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\* Wang et al. 2018. Recycling dredged sediment into fill materials, partition blocks, and paving blocks: Technical and economic assessment. *Journal of Cleaner Production* 199:69-76.

# Take-aways

- Drive toward a circular economy necessitates beneficial use of contaminated sediment.
- Establishing that clean and contaminated dredged material have separate and distinct end uses makes a lot of practical sense.
- Finding beneficial uses for the volumes of contaminated material dredged is feasible.
- Some contaminated sediment processing technologies are established. Others are in development.
- Annual avoided costs could be on the order of a billion dollars of a year.
  - *Enough to finance development of contaminated sediment processing operations*
- Policy to substitute contaminated sediment-derived construction material for other feedstocks likely to be needed.

