

## Paint Chips in the Presence of Sediment

Polymeric Sampling Device—Polyethylene

### Summary

<b>Media:</b>	Sediment mixed with paint chips
<b>Study Type:</b>	Ex situ
<b>Technology:</b>	Equilibration
<b>Peer Reviewed:</b>	Yes
<b>Publication Date:</b>	January 2022

### Study Description

- This case study reports on a lab study that evaluates the bioavailability of PCBs associated with paint chips dispersed in sediment.
- PE passive samplers were deployed in the field-collected sediments and in sediments historically mixed with paint chips.
- The bioavailability of PCB was represented by the polymer-sediment accumulation factor (PSAF), defined as the ratio of the PCB concentrations in the PE and organic carbon normalized concentrations in sediment.
- Equilibrium was assessed by varying the equilibrium time.

### Remedial Phase

Not applicable. Lab study on bioavailability.

### Outcome

The PSAFs for the field sediments were ~ 50–60 and ~ 5 times higher than for the relatively uncontaminated sediment amended with paint chips for the size fractions 0.25–0.3 mm and < 0.045 mm, respectively. Bioavailability for PCBs associated with paint chips is much lower than PCBs associated with field-collected sediment. PCB in fine-grained paint chips (< 0.045 mm) is more bioavailable than in coarse-grained paint chips (> 0.25 mm).

### Case Study Reference

Lotufo, Guilherme R., Philip T. Gidley, Andrew D. McQueen, David W. Moore, Deborah A. Edwards, Jeffery Hardenstine, and Allen D. Uhler. 2022. Passive-Sampler-Based Bioavailability Assessment of PCB Congeners Associated with Aroclor-Containing Paint Chips in the Presence of Sediment." *Archives of Environmental Contamination and Toxicology* 82 (1): 105–18. <https://doi.org/10.1007/s00244-021-00907-2>

*Supplemental information provides the raw congener data for the sediment and sediment + paint chips samples. The congener profiles for paint chips may be useful for forensic evaluation.*