PCB Symposium: Managing PCBs in Building Materials & Schools

November 1, 2023

During Building Demolition

- **Washington State** https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Dangerous-waste-guidance/Common-dangerous-waste/Construction-and-demolition/PCBs-in-buildings

- **Bay Area** https://basmaa.org/featured-programs-projects/pcbs-management-during-demolition/
    - PCBs in Priority Building Materials: Model Screening Assessment Applicant Package
    - Protocol for Evaluating Priority PCBs-Containing Materials before Building Demolition

In Schools

Vermont

- Polychlorinated Biphenyls (PCBs) in Schools | Vermont Department of Environmental Conservation
- Polychlorinated Biphenyls (PCBs) in Schools | Vermont Department of Health
    - Development of School Action Levels
    - Short-Term Occupancy Options
    - Development of Screening Value
- The Class of 1964 Policy Research Shop, PCB testing in Vermont Public Schools
- Release of Airborne Polychlorinated Biphenyls from New Bedford Harbor Results in Elevated Concentrations in the Surrounding Air (2017) https://doi.org/10.1021/acs.estlett.7b00047

Keri Hornbuckle

Videos about PCBs in schools:

- Why study PCB emissions in Schools
- How do we measure airborne PCBs and emissions in Vermont schools
- Additional short videos from Keri's group

Iowa Superfund Research Program's publications about PCBs in school air:

- "Polyurethane Foam Emission Samplers to Identify Sources of Airborne Polychlorinated Biphenyls from Glass-Block Windows and Other Room Surfaces in a Vermont School" (2023): https://pubs.acs.org/doi/full/10.1021/acs.est.3c05195
- "Congener-Specific Emissions from Floors and Walls Characterize Indoor Airborne Polychlorinated Biphenyls" (2023): https://doi.org/10.1021/acs.estlett.3c00360
- "Common Misconceptions about PCBs Obscure the Crisis of Children's Exposure in School" (an opinion piece, 2022): https://doi.org/10.1021/acs.est.2c07943

- "Room-to-Room Variability of Airborne Polychlorinated Biphenyls in Schools and the Application of Air Sampling for Targeted Source Evaluation" (2021): https://doi.org/10.1021/acs.est.0c08149
- "Airborne PCBs and OH-PCBs Inside and Outside Urban and Rural U.S. Schools"(2017): https://doi.org/10.1021/acs.est.7b01910

Polyurethane Foam Passive Emission Sampler to study emissions of PCBs from building materials

- Jahnke, J.C. and K.C. Hornbuckle,PCB emissions from paint colorants. Environmental Science & Technology, 2019, 53 (9), pp 5187–5194, https://doi.org/10.1021/acs.est.9b01087
- Herkert, N.J., J.C. Jahnke, and K.C. Hornbuckle, Emissions of Tetrachlorobiphenyls (PCBs 47, 51, and 68) from Polymer Resin on Kitchen Cabinets as a Non-Aroclor Source to Residential Air.Environmental Science & Technology, 2018. 52(9): p. 5154-5160. https://doi.org/10.1021/acs.est.8b00966

Effective volume for PCBs collected with PUF-PAS

Outdoors

- https://pufpasvolume.org/
- Persoon, C.; Hornbuckle, K. C., Calculation of passive sampling rates from both native PCBs and depuration compounds in indoor and outdoor environments. Chemosphere 2009, 74, (7), 917-923. https://doi.org/10.1016/j.chemosphere.2008.10.011
- Petrich, N. T., Spak, S. N., Carmichael, G. R., Hu, D., Martinez, A., Hornbuckle, K. C. (In Press) Simulating and explaining passive air sampling rates for semi-volatile compounds on polyurethane foam passive samplers. July 25, 2013 Environmental Science & Technology. https://doi.org/10.1021/es401532q
- Herkert, Nicholas J, Martinez, Andres, Hornbuckle, Keri C,A Model Using Local Weather Data to Determine the Effective Sampling Volume for PCB Congeners Collected on Passive Air Samplers.Environmental Science & Technology, 2016 July, 50:6690-7. https://doi.org/10.1021/acs.est.6b00319
- Herkert, N.J., S.N. Spak, A. Smith, J.K. Schuster, T. Harner, A. Martinez, and K.C. Hornbuckle,Calibration and evaluation of PUF-PAS sampling rates across the Global Atmospheric Passive Sampling (GAPS) network.Environmental Science: Processes & Impacts, 2018. 20(1): p. 210-219. https://doi.org/10.1039/c7em00360a

Indoors

- Herkert, N.J. and K.C. Hornbuckle,Effects of room airflow on accurate determination of PUF-PAS sampling rates in the indoor environment. Environmental Science: Processes & Impacts, 2018. 20(5): p. 757-766. https://doi.org/10.1039/c8em00082d

Additional Resources Shared in the Chat

- https://www.epa.gov/pcbs/technical-guidance-determining-presence-manufactured-pcb-products-buildings-and-other
- https://www.epa.gov/pcbs/pcb-facility-approval-streamlining-toolbox-fast-streamlining-cleanup-approval-process
- Dr Pei-Yu Wu, recently published a really interesting paper on an approach to use machine learning to identify PCBs (and asbestos) in buildings. https://www.sciencedirect.com/science/article/pii/S0921344923003877
- https://wspehsu.ucsf.edu/projects/pcbs/

- https://www.edweek.org/policy-politics/vermont-is-first-state-to-sue-monsanto-over-pcbs-in-schools/2023/06

Tracking with PCB Sniffing Dogs

There was a lot of interest in using detection dogs to trace PCB sources. The University of Washington Conservation Canines are pretty incredible; see for yourself.

If you want to dig deeper, check out the materials from the University of Washington Conservation Canines and Seattle Public Utilities pilot using detection dogs to trace PCB sources. Email Michael Jeffers (Jeffers, Michael Michael.Jeffers@seattle.gov) and Julianne Ubigau (julianne@fieldlabdetection.com) to learn more

- Overview of University of Washington Conservation Canines
- Short overview video from the Earthshot prize
- Most recent pilot study report and proposed standard operating procedures
- Original pilot study from 2017, which showed that both detection dogs and inspectors can learn to recognize PCB odors
- Video from Julianne Ubigau about testing dogs for PCB recognition