Evaluation of Potential Risks from Mercury *via* Inhalation of Indoor Air from Beneficial Use of Coal Combustion Products (CCPs) in Building Materials

Chris M. Long[1], Ari S. Lewis[1], and Sonja S. Sax[1]

[1]Gradient Corporation, 20 University Road, Cambridge, MA 02139

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ABSTRACT

Coal combustion products (CCPs), including coal fly ash (CFA) and flue gas desulfurization (FGD) residues, are receiving increasing use as substitutes for traditional substances in building materials. Because of the presence of Hg in CCP materials, concerns have been raised regarding the potential for Hg to volatilize from building materials into indoor air. To address this, we conducted a screening-level assessment to estimate worst-case inhalation risks from indoor air exposures to Hg for two CCP utilization scenarios: (1) FGD synthetic gypsum wallboard used in a school classroom or home, and (2) CFA concrete blocks used in a school classroom. For CFA concrete, we relied on studies that measured Hg emissions during dry curing of concrete to calculate a worst-case emission rate and an emission rate more reflective of long-term emissions (based on extrapolation). For wallboard, Hg release rates were based on flux chamber experiments measuring Hg volatilization from synthetic gypsum wallboard samples. We estimated indoor air Hg concentrations using these Hg release rates and conservative values for other parameters (*e.g.*, air exchange rates) in a steady-state indoor air model. Even using parameters intended to overstate potential exposures, we predicted indoor air Hg concentrations that were below ambient background Hg levels and that were well below established inhalation toxicity criteria (hazard indices ranged from 0.0002 to 0.016). Based on our findings, we conclude that Hg exposures from the use of CCPs in concrete and wallboard building materials in either classroom settings or in residential homes are associated with negligible risk.

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