

Mercury Risks *via* Inhalation from Use of Coal Combustion Products (CCPs) as Structural Fill and from Disposal of CCP-Containing Wallboard and Concrete in Landfills

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ABSTRACT

The beneficial use of coal combustion products (CCPs) conserves natural resources, reduces landfill waste, and can improve the quality and performance of construction materials. Concerns remain, however, about potential exposures to Hg in CCPs, including coal fly ash (CFA) used in concrete and structural fills, as well as flue gas desulfurization (FGD) used in wallboard. To examine potential exposures to Hg emissions from CCPs, we conducted a screening-level risk assessment to determine worst-case inhalation exposures to Hg for two outdoor exposure scenarios: (1) CFA used as structural fill material, and (2) CCP concrete and wallboard disposed of in a construction & demolition (C&D) landfill. For the structural fill scenario, we considered both fugitive dust emissions containing inorganic Hg and volatilization of elemental Hg from the CFA. For the landfill scenario, we considered volatilization of elemental Hg from CCPs in concrete and wallboard. We estimated outdoor Hg air concentrations using US Environmental Protection Agency's (US EPA's) Wind Erosion Model and the Screen 3 Model applying conservative, worst-case assumptions. To estimate potential risks to children and adults, we compared the modeled outdoor air concentrations to toxicity criteria. Our results showed that Hg exposures *via* inhalation from the CCP materials are near or below ambient Hg levels and several orders of magnitude lower than health-based toxicity criteria. Our findings thus indicate that upper-end exposures to Hg from the beneficial use of CCPs in structural fills, and from disposal of building materials containing CCPs, are not expected to pose an inhalation health risk.

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