

Emission and Leaching Potential of Mercury from Flue Gas Desulfurization (FGD) Byproducts Amended Soil

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KEYWORDS: Mercury, FGD Material, Sol Amendment, Emission, Leaching, Bioaccumulation

ABSTRACT

The potential of emission, leaching and bioaccumulation of mercury and other environmental-concerned trace elements (such as arsenic, selenium and chromium) from FGD material-amended soils were investigated. The benefit of using FGD material in improving plant growth and soil properties were also studied. Both laboratory-scale greenhouse and mesocosm field studies were conducted to collect environmental and plant growth monitoring data, which provides vital information to conduct the life cycle analysis. Two FGD gypsums and a slurry cake collected from a FGD wastewater treatment plant were used in this study. While carrying out laboratory study, sorbent traps installed at the inlets and outlets of the greenhouse chambers were analyzed for Hg using a direct combustion atomic adsorption spectroscopy. The weights of plants from each chamber were recorded right after they were harvested and also after they were oven-dried at 40°C. The Hg concentration of each plant was measured using the Lumex RA-915 after oven-dried. The concentration of Hg in the infiltration was measured using a cold-vapor atomic absorption or fluorescence spectroscopy. For soil and the tested FGD slurry sample, the Hg contents were measured after being air-dried. Field and LCA studies are currently on going. Results from this study will be discussed.

**Submitted for consideration in the 2009 World of Coal Ash Conference,
May 4-7, 2009.**