

Potential for Metal Leaching and Toxicity from Fly Ash Applied for Increasing Carbon Sequestration in Soil

Anthony V. Palumbo¹, Jana C. Tarver¹, Lisa Fagan¹, Rose Ruther², and James E. Amonette³

¹ Oak Ridge National Laboratory, Environmental Sciences Division, P.O. Box 2008, Oak Ridge, TN 37830-6038; ³ New College, Florida; ² Fundamental Science Directorate, Pacific Northwest National Laboratory, Richland, WA 99352;

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ABSTRACT

Previous work with leaching of metals from several fly ashes (both class F and class C) indicated minimal potential of leaching of toxic levels of metals from most fly ashes tested. Also, mixing fly ash with soil and other amendments (phosphate fertilizer) significantly decreases Cr, Li, Pb, and Cd in the leachate. One concern is that the characteristics of fly ash may be changed by the addition of NOx removal equipment that potentially results in higher levels of ammonia in the fly ash. We are concerned with fly ash since our laboratory and field studies show that addition of fly ash may increase carbon sequestration in reclaimed mine soils. However, the use of such amendments must overcome public concerns about possible release of toxic metals before the practice is generally accepted. We have recently been testing fly ash with a wide range of pH (3.7-12.4) originating from systems with NOx removal equipment. Toxicity testing with the Microtox® system has indicated little potential toxicity in leachates from the fly ash sources except for the fly ash at 12.4 pH. However, when the leachate from this fly ash was neutralized toxicity was eliminated. Additional data on ammonia and metal concentrations actually present in the fly ash should help indicate potential sources of toxicity (if any) and variations among the fly ashes.

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