Trouble in Paradise?

Do High Blood Lead Levels in Lancaster County Correlate to Elevated Soil Lead Levels in Selected Communities?

ABSTRACT

Lead is a toxic metal that was used for many years in products in and around our homes. Lead can also be emitted into the air from motor vehicles and industrial sources. Lead toxicity is a concern for people of all ages and can affect almost every organ and system of the body. In particular, lead exposure can adversely affect the cognitive development and behavior of very young children.

Because of the real danger of lead exposure, the Environmental Protection Agency has set standards for acceptable lead levels in soil. These standards are 400 parts per million (ppm) in play areas and gardens, while non-play areas are set at 1,200 ppm. In addition, for children aged six years or less, the Centers for Disease Control has defined an elevated blood lead level (BLL) as 10 micrograms per deciliter (mcg/dl) or higher. However, there is evidence that adverse effects can occur at even lower levels.

A 2007-2011 summary of elevated blood lead levels in Lancaster County performed by Lancaster General Research Institute has indicated that there are several "hot spots" in the county where children have elevated blood lead levels. Do these elevated levels correlate with elevated soil lead levels in those same areas? This research project examined four zip code sites that indicated higher than normal blood lead levels, and tested soil samples from these sites for concentrations of lead, to determine if the samples exceeded the standards set by the EPA. This project also examined the histories of each site, to determine whether prior usage of the site had any bearing on the levels of lead found in the analysis.

For this experiment, approximately 10 samples were taken from four different county sites and analyzed using an XRF spectrometer. The sites were Northwest Corridor Linear Park (17603) and Reservoir Park (17602), located in the City of Lancaster, PA, as well as Paradise PA (17562) and Marietta, PA (17547).

Based on the results, there were two locations with average soil lead levels higher than 400 ppm (Northwest Corridor Linear Park and Marietta) and two with average soil lead levels lower than 400 ppm (Reservoir Park and Paradise).

An analysis of the historical use of three of the four sites indicates that prior usage might contribute to the increased levels of blood lead levels. It might also contribute to the increased soil lead levels in three of the sites.