

Assessment of Lead and Cadmium Soil Contamination in the Vicinity of a Non-Ferrous Metal Smelter –
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Summary

The aim of this study was to assess soil contamination with toxic metals in the area of Piekary Śląskie (Silesian Voivodeship), taking into consideration various land use patterns. The scope of research covered the determination of lead and cadmium concentration in soil in the following areas: allotment gardens, fallow lands and kindergarten playgrounds. The lead and cadmium concentrations in soil samples were determined using a flame atomic absorption spectrometry technique, after the *aqua regia* extraction in a MDS 2000 microwave digestion system. The metal contents in the analyzed soil samples varied remarkably, depending on the sampling location and its distance from the main emitter of toxic metals in Piekary Śląskie, i.e. "Orzeł Biały" Non-Ferrous Metal Smelter. Metal concentrations determined in all soil samples significantly exceeded the concentration levels accepted in Poland for arable lands and built-up areas. The lead and cadmium concentrations in soil should become the basis for stopping edible plants cultivation in the area of Piekary Śląskie. The contaminated soil in kindergarten playgrounds can be an important source of lead and cadmium contamination, posing hazard to the children's health. The quality of playgrounds contaminated with toxic metals should stimulate undertaking actions aimed at modernization of playgrounds and reduction of the children's contact with soil. In the context of the applied result assessment criteria the soil concentrations of these metals observed in the region of Piekary Śląskie should arouse great concern among its users and local authorities.