ABSTRACT

This diploma thesis deals with the health risk assessment for arsenic contaminated soil. The hazard index (HI) and incremental lifetime cancer risk (ILCR) was assessed for inhabitants of conurbations resulting from chronic oral and dermal exposure for arsenic contaminated soils in the Czech Republic. Risk were assessed for the residential exposure scenario using deterministic methods and probabilistic methods with the Monte Carlo simulations. The US EPA models were used for the assessment. The special attention was paid to child population. Results of the arsenic content measurements in the cities of the Czech Republic were used as entry data for the health risk assessment. This monitoring is guaranteed by the National Institute of Public Health, Prague.

HI level 1 was not exceeded neither for children, nor for adults, in any of the monitored location. ILCR bound 1.10^{-5} was for children exceeded in 8 of 15 monitored locations. ILCR bound 1.10^{-6} for the whole Czech Republic area was exceeded for 99% of child population and 64% of adult population, 47% of child population and 4% of adult population exceeded ILCR bound 1.10^{-5}. The risk 1.10^{-6} in the cumulative arsenic exposure during childhood and adulthood was exceeded for 99% and the risk 1.10^{-5} was exceeded for 54% of monitored population of residents.

The results of the thesis warn of the significant acceptable risk exceeding at local level as well as at regional level. The results confirmed increased health risk from exposure to contaminated soils especially for the pre-school children.