

## **Risk Assessment of Trace Metals in the Soil Surface of an Abandoned Mine, El-Abed Northwestern Algeria**

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**Abstract :** Context/Purpose: One of the largest mining operations for lead and zinc deposits in northwestern Algeria in more than thirty years, El Abed is now the abandoned mine that has been inactive since 2004, leaving large amounts of accumulated mining waste under the influence of Wind, erosion, rain, and near agricultural lands. Materials & Methods: This study aims to verify the concentrations and sources of heavy metals for surface samples containing randomly taken soil. Chemical analyses were performed using iCAP 7000 Series ICP-optical emission spectrometer, using a set of environmental quality indicators by calculating the enrichment factor using iron and aluminum references, geographic accumulation index and geographic information system (GIS). On the basis of the spatial distribution. Results: The results indicated that the average metal concentration was: (As = 30,82), (Pb = 1219,27), (Zn = 2855,94), (Cu = 5,3), mg/Kg, based on these results, all metals except Cu passed by GBV in the Earth's crust. Environmental quality indicators were calculated based on the concentrations of trace metals such as lead, arsenic, zinc, copper, iron and aluminum. Interpretation: This study investigated the concentrations and sources of trace metals, and by using quality indicators and statistical methods, lead, zinc, and arsenic were determined from human sources, while copper was a natural source. And based on the spatial analysis on the basis of GIS, many hot spots were identified in the El-Abed region. Conclusion: These results could help in the development of future treatment strategies aimed primarily at eliminating materials from mining waste.

**Keywords :** soil contamination, trace metals, geochemical indices, El Abed mine, Algeria

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