

## SURFICIAL SOIL CONTAMINATION AROUND A ZINC PROCESSING FACTORY

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### Introduction

Zn smelting plants located at Aubry (Northern France) for more than 100 years have strongly polluted the surroundings through dust emissions, storage of ores and slag without strong environmental concerns. Although highly contaminated surficial soils have been removed in the private and public gardens to safeguard at least partly health of the inhabitants, one small public area, called the Peru Park, has not been treated because of the presence of peculiar calamine grasslands.

### Methods

Several sampling campaigns have been scheduled from 2012 to 2014. After having mapped the contamination of the whole park's topsoil, porous candles were installed at two depths, and partial extractions were performed with the aim to evaluate the mobility of metals in the soils of this park.

### Results

Our investigations clearly evidenced a very strong contamination by several metals with great variations because some small areas were treated allowing recreational activities. The maximal total values measured were: 21000 mg kg<sup>-1</sup> for Zn, 3500 mg kg<sup>-1</sup> for Pb and 160 mg kg<sup>-1</sup> for Cd. Additionally, the mobility of these metals is important in soils and increases with the pollution level. In the pore waters of strongly polluted zones, our findings are more contrasted with high concentrations of free dissolved Zn (3.6-32 mg L<sup>-1</sup>) and to a lesser extent Cd (0.02-0.25 mg L<sup>-1</sup>), whereas dissolved Pb remains at low concentrations (0.0001-0.021 mg L<sup>-1</sup>) and is quite exclusively bound to humic substances.

### Conclusion

This study obviously underlines that the severe recorded pollution and the high mobility of Zn and Cd could strongly impact the ground water quality (at least in the surficial aquifer) and the trophic chain present in this area.