# Arsenic mobility in soil of Paracatu

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**Introduction**

The mobility and the bioavailability of arsenic is influenced by a particular solid phase of which it is associated. Based in the concepts of natural attenuation/intrinsic remediation [1], this study estimate the potential arsenic mobility and release by a sequential extraction method [2] and column leaching tests [3] in 3 samples of contaminated soils. The samples used in this work were collected around a gold mine area, in the Paracatu city, Minas Gerais, SE Brazil.

**Results**

**Table 1**: Arsenic speciation obtained by the sequential extraction method (mg.kg$^{-1}$ dry weight).

| Step / Sample | P1 Soil | P2 Soil | P3 Soil |
|---|---|---|---|
| Exchang. Ions | 0.3 | < L.D. | < L.D. |
| Carbonates | 1.1 | 0.7 | < L.D. |
| Mn Oxides | 0.5 | 0.5 | 0.1 |
| Amorphic Fe Oxi. | 265.9 | 219.0 | 2.9 |
| Sulphides and Org.Mat. | < L.D. | 1.9 | < L.D. |
| Metals Bound in Lithog. Mat. | 943.3 | 356.2 | 927.6 |

**Table 2**: Arsenic concentrations in leaching extracts (μg.L$^{-1}$ ).

| Leaching | Time (h) | P1 Soil | P2 Soil | P3 Soil |
|---|---|---|---|---|
| Deinonized Water | 24 | 18.9 | 14.0 | 16.9 |
| Deinonized Water | 72 | 13.6 | 10.1 | 16.7 |
| Calcium Chloride 0,01 M | 192 | < L.D. | < L.D. | < L.D. |
| Calcium Chloride 0,01 M | 336 | < L.D. | < L.D. | < L.D. |
| Deinonized Water | 384 | 4.6 | 7.5 | 6.1 |
| Deinonized Water | 408 | 2.8 | 3.7 | 9.5 |

The sequential extraction results indicate that the presence of As is in a form less available in the soil, binding to iron oxides and compounds partially oxidized from the original mineral. Leaching tests clearly show a retaining process of arsenic with the addition of calcium chloride solutions. For a more conclusive evaluation about the process described here, further studies are currently being carried out.

[1] Gerth *et al* (2001), *Treatment of Contaminated soil*, 603-614. [2] Salomons & Förstner (1980) *Environ. Tech. Lett.* **1**:506–518. [3] Dankwarth *et al*. (2000). *In: 11th ICHMET*, 1277.