# Cu, Zn and Pb geochemistry of stream sediment samples from mineral exploration surveys, Hauraki Goldfield, New Zealand

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Mineral exploration companies have carried out stream sediment geochemical surveys during the 1970s and 1980s in the Hauraki Goldfield in their exploration for epithermal Au-Ag and porphyry Cu deposits, and submitted their results to Government as a condition of their permits. The data were compiled in the REGCHEM (Regional Exploration Geochemistry) database, managed by GNS Science [1]. The database contains analyses for >11,000 fine fraction stream sediment samples from >80 separate surveys. The stream sediment samples were typically analysed for Au and As, and in many cases for other elements including Cu, Pb, Zn, Sb, W and Mo. However, only analyses for Cu, Pb and Zn have coverage over most of the area, and all of their concentrations above the lower levels of detection for the elemental analyses. Maps of contoured Cu, Pb and Zn concentrations generally show an enrichment, and most anomalous values, in the western part of the goldfield. This is interpreted to reflect tilting of the goldfield to the east and deeper levels of erosion on the western side of the goldfield. The epithermal deposits are vertically zoned with Cu-Pb-Zn sulphide minerals more common in their deeper levels. Erosion into this deeper Cu-Pb-Zn epithermal and porphyry Cu mineralisation accounts for the enrichment of these elements on the western side of the goldfield, to elevate their background concentrations. Strongly anomalous values are related to specific epithermal and porphyry copper style occurrences.

[1] Warnes & Christie (1995) *AusIMM Pub Series 9/95*, 611-616.