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Characterise and quantify contamination from anthropogenic activities within the Crocodile (West) and Marico Water Management areas, South Africa

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Chemical signatures from river waters and sediments were collected in the Crocodile (West) and Marico Water Management Areas, South Africa. Surface water samples were analysed for anion complexes using Ion Chromatography (IC) and major and trace element chemistry using quadrupole Inductively Coupled Plasma-Mass Spectrometry (q-ICP-MS). Major and trace element chemistry was measured by XRF and mineralogy by XRD on all sediment samples. The results are used to define the various chemical signatures resulting from activities within the study area and to differentiate the 'background' that arises from natural geological heterogeneity. The aim of this characterisation is to fingerprint the chemical signatures of various anthropogenic activities irrespective of background in order to gain an insight into the level of chemical contamination by the receiving environment. Based on the results, the contamination sources within the area can be identified and ranked in terms of the contribution to the total effective chemical contamination received at Hartebeespoort Dam.
Keywords: Heavy metal, chemical fingerprint, geochemistry, South Africa

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