



HAL
open science

Fluvio-lacustrine formation of New Caledonia: post-deposit processes and dynamics of trace metallic elements

Jean-Baptiste Parmentier, Maximilien Mathian, France Pattier, Virginie
Gaullier, Pierre Maurizot, Nicolas Tribovillard, Alain Zanella, Cyril
Marchand, Peggy Gunkel-Grillon

► To cite this version:

Jean-Baptiste Parmentier, Maximilien Mathian, France Pattier, Virginie Gaullier, Pierre Maurizot, et al.. Fluvio-lacustrine formation of New Caledonia: post-deposit processes and dynamics of trace metallic elements. 61st Annual Meeting of The Clay Minerals Society and 5th Asian Clay Conference, Jun 2024, Honolulu (Hawai'i), United States. hal-04675301

HAL Id: hal-04675301

<https://hal.science/hal-04675301v1>

Submitted on 22 Aug 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

FLUVIO-LACUSTRINE FORMATION OF NEW CALEDONIA: POST-DEPOSIT PROCESSES AND DYNAMICS OF TRACE METALLIC ELEMENTS

PARMENTIER Jean-Baptiste¹, MATHIAN Maximilien*¹, PATTIER France¹, GAULLIER Virginie², MAURIZOT Pierre³, TRIBOVILLARD Nicolas², ZANELLA Alain⁴, MARCHAND Cyril¹ and GUNKEL-GRILLON Peggy¹

¹University of New Caledonia, BP R4, 98851, Noumea, New-Caledonia; ²University of Lille, CNRS, Univ. Littoral Côte d'Opale, IRD, UMR 8187, LOG, Laboratoire d'Océanologie et de Géosciences, F59000 Lille, France; ³New Caledonia Geological Survey, BP 465, 98845, Noumea, New Caledonia; ⁴University of Le Mans, Avenue Olivier Messiaen, 72085, Le Mans, France

*maximilien.mathian@unc.nc

Located in the south-west Pacific, New Caledonia is an archipelago with a complex geodynamic history. Grande Terre, the main island, is covered by more than 25% of tropical regoliths developed on ultramafic rocks. These peridotites, naturally enriched in metallic elements (Fe, Mn, Al, Ni, Co, Cr), constitute most of the southern part of New Caledonia. Since approximately 27 Ma, these rocks have undergone weathering, under a humid and warm climate, and erosion. This combination has led to the formation of the fluvio-lacustrine system, by accumulation of sediments eroded from local summits in depressions and valleys. The sedimentary filling of this system is essentially of fluvial origin, with rare lacustrine occurrences. Its structure is complex and some sedimentary levels show abnormally high accumulations of Trace Metallic Elements (Ni, Co, Cr).

This poster will display the first results of a project aiming to understand the mobility of these metals in this system. These results are focus on outcrops hosting several networks of hardened iron oxides and Mn oxides partitions, intersecting clayey (figure below). The preliminary results, crossing X-Ray diffraction, X-Ray fluorescence and Scanning Electron Microscope with sedimentological analyses have revealed enrichments in Mn within the partitions. Such results point to the fact that fluid circulations that have affected the fluvio-lacustrine formation likely contributed to the remobilization of metallic elements prior to its structural organisation and caused the formation of several distinct generations of Fe and Mn oxides.

