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FRAME: towards conflict-free Nb-Ta for the European Union

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The GeoERA FRAME project focuses on several of the main raw material-related objectives of the EU Commission. FRAME work package 6 (WP6), targets so-called conflict minerals, chiefly those mined to extract niobium (Nb) and tantalum (Ta). These chemically related critical metals are essential components in a range of applications and products including electronics, steel alloys and superalloys widely required by the European industry. Today, significant amounts of Ta and associated Nb are sourced as conflict minerals from the central African region, not least the DRC (Congo-Kinshasa).

A main objective of FRAME WP6 is to do a survey of the European distribution of these metals and their deposits, thus enhancing their exploration interest and potential to help enable ethical and indigenous production for the EU.

While WP6 compiles data on Nb-Ta mineralisations from the whole of Europe, the main focus is put on the Swedish part of the Fennoscandian Shield and the Iberian Variscan Massif.

The Nb-Ta mineralisations of the Iberian Peninsula belong to the southwestern extension of the European Variscan Belt. From both an economic and a metallogenetic point of view, the most interesting Nb-Ta deposits in Spain are those in which mineralisation occurs as disseminations throughout small leucogranite bodies, as is the case for the deposits Golpejas, El Trasmorquión, Fontao, Penouta and in some occurrences of the Morille-Martín district. These have been exploited previously for Sn, Ta-Nb, and/or W. Penouta, which is the biggest known Ta-deposit in Spain, was mined intermittently between 1906-1985. The mine has recently started re-processing old tailings. Most Nb-Ta mineralisations in the Fennoscandian Shield are hosted by LCT-type (lithium-cesium-tantalum-enriched) granitic pegmatites that occur mainly in regions featuring abundant Palaeoproterozoic low to low- medium-grade metasedimentary rocks and associated S-type granites. Some of these have been studied during different earlier exploration campaigns. NYF-type (niobium-yttrium-fluorine-enriched) granitic pegmatites occur as individual dykes and fields throughout the Proterozoic bedrock of Sweden. Research in WP6 will focus on a few selected Swedish deposits and occurrences including Järkvissle and Bergby in central Sweden, as well as

Stripåsen, Utö and other rare-element pegmatites in the Bergslagen province. Emphasis during the start of the project was to identify key areas and mineralisations within these two regions that can be studied in detail.

Based on available information in the databases and archives of the partner surveys, a list of Nb-Ta occurrences and deposits has been produced. Ultimately, at the end of the project, a report on the distribution and systematics of Nb-Ta mineralisations in Europe will also be produced. Prospective regions and their character of mineralisation will be summarized together with the overall European potential, in order to develop recommendations for future exploration. Furthermore, a discussion of conditions of Nb-Ta production in central Africa with the aim to suggest improvement to these issues will be made. The potential of intra-European production of Nb-Ta to decrease the present near-total dependence on imports will also be assessed. As another outcome, an Inspire-compatible pan-European dataset of Nb-Ta mineralisations will be provided to the GeoERA information platform.

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