

## **REAPPRAISAL OF THE MINERAL POTENTIAL OF THE ARABIAN SHIELD : A GIS SYNTHESIS AND MULTICRITERIA CROSS-ANALYSIS OF GEOLOGIC AND METALLOGENIC DATA**

NEHLIG P., ASFIRANE F., BRAUX CH., GENNA A., GUERROT C., EBERLÉ J.M., LASSERRE J.L., LEISTEL J.M., NICOL N., SALPETEUR I., SHANTI M., THIÉBLEMONT D. AND THE ARABIAN SHIELD PROJECT PARTICIPANTS  
(\*)BRGM, B.P. 6009, 45060 Orléans Cedex 2 (France)(\*)DMMR P.O. Box 345, Jeddah 21191 (Saudi Arabia)

The Arabian Shield is a part of a larger geological ensemble, the Arabian-Nubian shield, which covers several countries, mainly Egypt, Eritrea, Ethiopia, Saudi Arabia, Somalia, Sudan and Yemen (2200 km NS x 1200 km EW). These different areas, accreted during the late Proterozoic, share a very similar geological evolution (accretion of volcanic island arcs) and many mineral deposits formed by similar processes (epithermal and mesothermal gold deposits...). The geology (in a broad sense) and mineral deposits have been worked in very different ways during the past decades. The resulting information is very heterogeneous and has only rarely been synthesised. In particular, synthesis documents for mining exploration purpose are very scarce, and often only available in the form of paper maps and not in a more modern version, namely Geographical Information System (GIS) and attached databases. GIS is a modern and efficient method of valorising the abundant data collected over the last decades. It provides an opportunity to re-examine the Shield from a geological and metallogenical angle and finally it is an opportunity to develop a sophisticated mineral exploration tool. A first stage in the achievement of this program involved a geological and metallogenical synthesis (under Arcview™) at the scale of the Arabo-Nubian Shield (1:1000 000). Following this preliminary stage, we focused on the Arabian Shield and reevaluated and compiled under Arcview™ and Mapinfo™ software several layers of information provided by the DMMR (Deputy Ministry for Mineral Resources) : geography, geology, structures, geochemistry, aeromagnetism, geochronology, paleosurfaces, surficial formations...and linked to a mineralised occurrence data base containing not only known information on the occurrences but also a new reappraisal of the metallogenical data as well as a quantitative evaluation of the regional- and local-scale geological, geophysical and geochemical exploration work that has been done on the different occurrences. Cross-analysis of these different layers of information with Synarc™, a software tool developed by BRGM and ESRI, allows to produce synthetic documents and thematic maps which can be used for the selection of new exploration targets and adapted methodologies. Examples will be shown and the GIS will be on display.