

The Mineral Potential of Saudi Arabia

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The Kingdom of Saudi Arabia encompasses a diverse geological setting, with the Arabian Shield comprising approximately 670,000 km² (27%) of its 2.15 million km² area. The Shield is an accreted terrane composed of variably metamorphosed and deformed rocks including rare Archean remnants together with NeoProterozoic oceanic and continental volcanic arcs and sedimentary basins which have been intruded by a wide variety of mostly granitic plutonic rocks. What remains is mostly composed of Paleozoic and younger sedimentary formations, and Tertiary to Recent basalt flows. The layered rocks comprise a narrow strip along the Red Sea coast and the Arabian Platform extending east from the Shield, including the petroleum reservoirs in the Ghawar Basin. Contrary to popular belief, eolian sands cover only about 600,000 km² leaving significant mountain ranges in the shield notwithstanding the 1,500 m escarpment marking the Shield's western edge near the Red Sea coast. Although its hydrocarbon production capacity is legendary, Saudi Arabia is blessed with a wide range of industrial mineral deposits as well as economically significant mesothermal and epithermal gold deposits, VMS-type base metal deposits and carbonate-hosted zinc deposits. It is ranked 7th as one of the largest phosphate producers and will probably improve its ranking in the near future. It has significant potential for a variety of other deposit models currently being tested by the Saudi Geological Survey: porphyry copper, SEDEX, REEs associated with alkaline granites and various uranium deposit types. Over the last 15 years, Saudi Arabia has steadily moved to streamline its regulatory framework to encourage investment in the solid Minerals Sector, and it has been rewarded with increased activity, particularly by domestic companies. Growth is also seen in the support sector with expanded geochemical laboratory and drilling services. As a destination for exploration investment, Saudi Arabia deserves a second look. This presentation will highlight the geology of the Kingdom and its mineral potential.