

Uranium in South Africa: Exploration, mining and production

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There are eight known uranium deposits in South Africa, which are: quartz-pebble conglomerate-hosted deposit in the Witwatersrand Basin, sandstone-hosted deposit in the Karoo Uranium Province, carbonaceous shale- and coal-hosted deposit in the Springbok Flats Basin, surficial deposit in the Namaqualand region, intrusive-hosted deposit in the Palaborwa, granite-related deposit in the Namaqualand region, and phosphorite deposits within the marine areas. However, the major uranium deposits, which contribute to the nation's uranium identified resource inventory, are quartz-pebble conglomerate, sandstone, coal, carbonaceous shale, and surficial deposits.

Between 1967 and 1976, uranium deposits were discovered in the Karoo Uranium Province (sandstone-hosted deposits), Namaqualand region (surficial deposits), and Springbok Flats Basin (carbonaceous shale and coal-hosted deposits). Recent exploration has increased the resource potential in these deposits, with the exploration activities focused on drilling to delineate resources at high levels of confidence. The Council for Geoscience is currently conducting high resolution magnetic and radiometric surveys and geochemical sampling in the Namaqualand region beyond the known uranium mineralization. The uranium in the Springbok Flats Basin is difficult to delineate from aerial radiometric data due to its deep depths of occurrence. However, the extent of the basin is clearly shown on the regional total counts image with contrast from the Bushveld granite which is believed to be the source of uranium mineralization in the Springbok Flats Basin. Gravity, magnetic and down hole surveys are planned to develop a three-dimensional structural understanding of the basin. In addition, a selected few drill holes have been drilled and completed in the beginning of 2014, by the Council for Geoscience, in the Springbok Flats Basin to ascertain the uranium mineralization extents in the basin. The results will be made available as soon as analysis and interpretations are completed.

Witwatersrand Basin is the only deposit where uranium mining is, at present, active in South Africa, from both the underground operations and the associated tailing dam facilities. The primary commodity in the basin is gold, with uranium recovered as by-product. Uranium is currently produced from Vaal River operations by processing the reef material from Moab Khotsoeng, Great Noligwa and Kopanang in the Noligwa gold plant/South Uranium plant circuit by reverse leach process.

Uranium production in South Africa begun in 1952, and reached peak production in the early 1980's in which production was over 6000 t of uranium per year. Uranium production has since declined to below 500 t of uranium per year by 2013. However, with production expected from Karoo Uranium Province and Namaqualand region in the near future, uranium production is expected to increase significantly by 2020.

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