

SITATION OF A GEOLOGICAL NUCLEAR REPOSITORY OF THE PROPOSED KENYA NUCLEAR POWER PLANT (NPP)

Energy development in Kenya is currently based upon the Vision 2030 platform which aims to enhance energy production by commissioning the establishment of the first nuclear power plant by the year 2022. Under the International Atomic Agency Commission guidelines, each country venturing or utilizing nuclear energy is responsible for the safe disposal of its own radioactive nuclear waste. This study aims to analyse the probable locality for the development of a deep geological repository based on IAEA guidelines regarding the lithology, hydrogeology, seismic potential and population density of South Eastern Kenya. Information required for this study entailed the review of geological reports, maps, publications, consultation with relevant experts and the use scientific papers. The Voi and Sultan Hamud areas in South Eastern Kenya are comprised mostly of the metamorphosed Neo-Proterozoic Mozambique Belt system which offers the stable foundation suitable for deep underground construction. Moderate seismic activity with a potential of about M5.0 event is experienced within this region influenced by the East African Rift Valley especially mostly due to the active Ol Doinyo Lengai Mountain. Temporary storage of High Level Nuclear waste is advisable to be around the power plant in water pools for 5 – 10 years for cooling purposes and for easier monitoring. From the pools, these may be stored in dry casks and later transported to the repository via road or railroad for permanent storage. Permanent storage relies on natural barriers and other physical barriers to effectively contain radioactivity deep on the earth at about 250m – 1000m in depth. Challenges such as skilled labour, radiological risks and the amount of capital required to develop and monitor these facilities among others have to be addressed. This study focuses on the conduciveness of South Eastern Kenya to host a repository due to its low population distribution, low to non-existent underground water and the proximity to the coastal area in which the NPP is highly to be commissioned. Further studies and investigations are still required to be carried out within the Voi area to assess the possibility of safely hosting a deep geological repository for radioactive wastes storage.