

ABSTRACT

The study assesses the influence of geology and geological structures such as faults, joints and fractures on elevated fluoride levels in groundwater around Elementaita area, Nakuru County, Kenya. It also documents defluoridation methods of water treatment in the area. The Elementaita area is located in the central rift of Kenya within the geographical co-ordinates $35^{\circ} 45' - 36^{\circ} 20' E, 1^{\circ} 00' - 0^{\circ} 15' N$. The local geology lies in the Naivasha Elementaita-Nakuru watershed. It is characterized by the following rocks: Alluvium, reworked water laid sediments, Quaternary lacustrine deposits, diatomite deposits, reworked sediments, tuffs, agglomerates and acid lava, trachytes, rhyolites, comendite and obsidian. The area is dominated by faults and voluminous fissural volcanic eruptions since Lower Miocene. The water catchment within the area is composed primarily of basic volcanics. It experiences high fluoride level in its groundwater which leads to major problems such as dental and skeletal fluorosis among its residents. Studies have shown that the area's geological and structural setup is responsible for the high fluoride levels. High fluoride levels are common in deeply drilled boreholes than surface water. A guideline value of maximum 1.5 ppm fluoride concentration in groundwaters is recommended by World Health Organization (WHO). Several fluoride removal methods have been documented in literature and are consequently applicable in the area of study. The project discusses the bone char method and its applicability in the area of study.

Key words:

Geological controls, Structural controls, Fluoride levels, Defluoridation, Elementaita area, Kenya