

Preliminary Study of Interaction between Tailing and the Hydrologic Cycle at a Uranium Mine near Tatanagar, India.

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The exposed rocks in southern Bihar show two facies, an unmetamorphosed one in the south and a metamorphosed one in the north, separated by a major thrust zone of 2 to 5 km wide and is bordered on its north and south by well marked shearing. Near the northern border of the zone are bands of quartz-mica-schists with tourmaline and kyanite. It is postulated that the mineralization took place in three stages. The earliest was the formation of apatite – magnetite lenses, followed by the bands of chlorite and amphibole – schists. Uranium mineralization is noted in the form of disseminated uranite, torbernite and autunite along the chlorite schist. Workable grade of uranium bearing ore, amounting to a few million tons are present in the uranium mines near Tatanagar in Jharkhand. The tailing piles at the mine were leached by water from the nearby geothermal springs present in Hazaribagh area in Jharkhand where few radioactive hot springs are reported. Water percolating through the tailing was found to be seriously contaminated by high levels of radium of the order of 7 to 9 ppm. In order to investigate the interaction of the tailings with the hydrological cycle, a geophysical survey was conducted to determine the presence and location of the water body. The results show that groundwater is present within the tailings pile and that this water has a high electrical conductivity compared with the groundwater of the adjacent natural area. When the groundwater from the tailings reached the external environment or mixes with the natural groundwater, serious environmental impacts occurred.

Key words: Metamorphosed, Uranium mineralization, Tailing piles, Leaching, Hydrological cycle