

## URANIUM IN GROUNDWATER IN INDIA: A REVIEW

Rajesh Kumar Dash<sup>1</sup>, AL. Ramanathan<sup>1\*</sup>, Shailesh Kumar Yadav<sup>1</sup>, Manoj Kumar<sup>1</sup>, T. Kuriakose<sup>2</sup> and Y.P.Gautam<sup>3</sup>

<sup>1</sup>*School of Environmental Sciences, Jawaharlal Nehru University, New Delhi, India*

<sup>2</sup>*Dept. of Industries and Earth Sciences, Tamil University, Thanjavur, TN, India*

<sup>3</sup>*Nuclear Atomic Power Station(NAPS), Narora, Uttar Pradesh, India*

*\*E-mail: alrjnu@gmail.com*

### Abstract

Uranium is a naturally occurring radioactive element that is both radiologically and chemically toxic. However, the chemical toxicity of natural uranium is much more pronounced than its radiological toxicity. The average concentration of uranium in the Earth's crust is 2.7%. The main source of uranium is granitic rocks though other types of rocks such as volcanic, sedimentary and metamorphic also contain uranium in trace amounts. Apart from the natural sources various anthropogenic activities viz. use of phosphate fertiliser, nuclear industry, mill tailings and combustion of coal are also responsible for uranium contamination in the environment. Excess intake of uranium in drinking water leads to several diseases like kidney damage, multi-organ targeted cancers, brain and neurological disorders etc. In India ground water is mostly used for agricultural and drinking purposes. Uranium levels vary from region to region depending on the geological, geochemical and hydrological conditions. There is an unevenness in the concentration of uranium in groundwaters of India due to the various type of geological formations. To get an overview of the concentration variation a review has been carried out in some selected states of India. According to Yadav et al., (2008) an uraniferous horizon has a higher uranium concentration than the WHO and USEPA limits of 15 and 60  $\mu\text{gL}^{-1}$  respectively in drinking water. Some studies also have been focused on the assessment of consumption of uranium at higher than the permissible limits. Main objective of this overview is to figure out the uranium contamination scenario in ground waters in selected parts of Andhra Pradesh, Rajasthan, Haryana, Punjab, Himachal Pradesh and Uttar Pradesh where ground water contains a higher concentration of uranium than the permissible limit and hence not fit for drinking purposes and the various possible sources for contamination of uranium in ground water.

*Keywords:* Uranium, Earth's crust, Phosphate fertilizers, Contamination, Nuclear Industries, Neurological problems.