



Spatial Distribution of Arsenic in Ground Water from Nuggihalli Mining Area and its Surroundings, Southern Karnataka, India

K. Rama Mohan*, A. Keshav Krishna, K. Manohar, N. N. Murthy

Environmental Geochemistry Division

National Geophysical Research Institute (Council of Scientific and Industrial Research)

Uppal Road, Hyderabad-500007, Andhra Pradesh, India

E-mail: krenviron@ngri.res.in

ABSTRACT

Arsenic (As) is one of the most toxic elements in the nature. The main aim of this study investigates the occurrence and distribution of arsenic in groundwater from Nuggihalli mining area and its surroundings, Southern of Karnataka, India. The ground water samples from the study area are analyzed for arsenic and other quality parameters (pH, TDS, Ca, Mg, Na, K, Cl, HCO₃, NO₃, SO₄, B, Fe, Mn). The elevated levels of arsenic concentrations are found in the range from 0.002 to 0.51 mg/L, which demonstrated that almost 79% of examined water samples exhibit arsenic concentration higher than the maximum concentration limit of WHO specifications (0.01mg/L) for drinking. Pierson's correlation analysis and principal component analysis were used to find out possible relationships among the examined parameters and ground water samples. Arsenic is highly correlated with manganese and iron suggesting common geogenic origin of these elements. No significant correlation observed between As and Ca or SO₄, suggesting that the contamination source of As is different in the wells. Spatial distribution was also explained to identify the areas with higher arsenic concentration in groundwater.

Keywords: Arsenic, Groundwater, Occurrence and distribution, Pierson's correlation, Principal Component Analysis
