

RISK CHARACTERIZATION AND ESTIMATION OF CARCINOGENIC RISK FOR SURFACE WATER INGESTION EXPOSURE TO SELECTED TRACE METALS IN THE AREA AROUND MANDIDEEP INDUSTRIAL COMPLEX, INDIA

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The area around Mandideep Industrial Complex covers about 190 km² area in Obaidullaganj tehsil of Raisen district of Madhya Pradesh India and lie between latitude 23°4' - 23°10' N and longitude 77°25' - 77°36' E. The Mandideep Industrial Estate comprises of about 394 production units that includes oil refineries, calico-carbide, bleaching powder, leather processing, rexene-foam, rubber tyres and tubes, pesticides, pharmaceuticals, plastic and PVC wires, and electrographite etc. These industries releases untreated hazardous effluent wastes through open course into perennial Betwa and Kaliasot rivers, thus polluting the surface water resources of the region. The study reveals that heavy metals like Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Sn, and Zn occur in high concentration in effluent and surface waters of the area. The water ingestion exposure to health risk assessment for elements like Cd, Cr, Fe, Ni, Pb and Sn have been worked out for child ages between 6 to 12 years and an adult for average life time and whole life time period. These studies are followed by an estimation of carcinogenic risk to these elements. The study suggest that carcinogenic risk factor is high for Sn, Fe and followed by Pb, Cd, Ni and Cr. The cancer risk is involved to human, if they have been exposed to the present concentration of these elements to an average life time period. A possible health hazards to human exposure have been discussed in detail.