

**TRANSPORT MODELING OF ARSENIC AFFECTED GROUNDWATER  
IN NADIA AND NORTH 24-PARAGANAS DISTRICTS  
OF WEST BENGAL, INDIA**

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**Abstract**

The study presented analyzes groundwater flow and transport behavior of arsenic contaminated groundwater in Nadia and North 24-Paraganas districts of West Bengal, India. The study evaluates possible remedial options for arsenic affected pockets. The objectives of the study are: to conceptualize the groundwater flow domain, to compute the groundwater flow paths and velocities for different stress conditions, to study the transport of Arsenic contaminated groundwater in the flow domain and to evaluate some of the remedial options to arrest the spreading of Arsenic. These objectives have been addressed through simulation of transient groundwater flow and transport model for the study area. The US Geological Survey three-dimensional flow model, MODFLOW and three-dimensional advective-dispersive-simple reactive modular transport code MT3D have been used as tools for flow and transport modeling. Simulated result is perfectly in coherence with the monthly observed water table condition. The simulation of transport phenomena indicate that presence of Arsenic in the flow domain is due to the activation and spreading of in-situ source(s). Evaluation of remedial options indicate that the arrest of lowering of water table particularly during peak withdrawal months (Nov. - April) to a certain level would minimize the activation processes of Arsenic in the flow domain. Creation of artificial hydraulic barrier by recharge wells seemed to be a reliable option to arrest the spreading of contaminated groundwater.

*Keywords:* Transport behavior of arsenic, Groundwater, West Bengal, Groundwater model, Remedial options.