

Understanding Shallow Basaltic Aquifer System Near West Coast of Maharashtra, India

Rangarajan, R.^{1*} and Rolland Andrade²

¹CSIR-National Geophysical Research Institute (CSIR-NGRI), Hyderabad-500007(TS), India

²Central Water and Power Research Station (CWPRS), Pune-411024(MS), India

(*Corresponding author, E-mail: rangarajanngr@gmail.com)

Abstract

Two-Dimensional (2D) Electrical Resistivity Tomography (ERT) and geophysical logging and injected tritium tracer studies with hydrogeological tests were carried out at selected location in an area of 5 km² near the coastal region of Tarapur, Thane district, Maharashtra. The area is in basaltic terrain, overlain by thin cap of alluvium formation and receives an annual rainfall of about 2000 mm. An integrated investigation method was adopted to delineate the subsurface lithological variations, understand the existing aquifer system up to 25 m depth, evaluate aquifer properties, recharge potential and also to monitor the groundwater flow characteristics. The investigation results showed a variable thickness of weathered zone of 1-3 m, existence of two basalt flows, low vertical natural recharge, high transmissivity, high hydraulic conductivity and high groundwater flow rates. The results also depicted that a combination of hydrogeological tests along with resistivity and tracer investigation is an effective tool in mapping and characterizing the shallow potential groundwater aquifer zone in Deccan traps. The integrated study carried out in the coastal area provided detailed subsurface information useful for planning specific water conservation strategies for sustainable groundwater supply.

Keywords: Deccan Traps, ERT, Tritium Tracer, Recharge, Groundwater Flow

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