Geochemistry of water around non-volcanic thermal springs in high grade metamorphic terrain, Sri Lanka

D.T. JAYAWARDANA[1] D.T. UDAGEDARA[2] AND A. PITAWALA[3]

[1] Sri Jayewardenepura University, Sri Lanka, daham@sci.sjp.ac.lk

[2] Uva Wellassa University, Sri Lanka, tharangau@yahoo.com

[3]University of Peradeniya, Sri Lanka apitawala@pdn.ac.lk

Geochemical survey was done for thermal water and cold water around non-volcanic geothermal fields in Sri Lanka. One hundred samples were analyzed for fifteen selected irons in order to investigate geochemical relationships due to water-rock interaction. Geochemistry of thermal waters are distinct from cold water. Higher contents of Na, K, Cl, F, SO_4 and TDS in the thermal water probably due to dissolution of minerals of the granitic rocks. Conversely, lower concentrations of Fe, Mg, Cu, Zn and Pb implied lower abundances of ferromagnesian minerals. Water classification using major ions shows Na-K-SO_4 type of thermal water. Cold water dominant by Na-K-HCO_3 type which reflect deep groundwater influence by iron exchange. In general, chemistry of the nearest cold water wells (< 400m) to the thermal water are significantly change due to direct mixing. There is a contrast for mixing of thermal water and cold water with increasing distance from the geothermal field. Gradual declines of SO_4 with increasing distance may indicate clear oxidation trend away from thermal water. However, chemistry of the far away wells demarcate deep circulations through the fractures and faults in the basement.