

Contamination of fresh water resources by Hot Water- Control by active carbon in Geothermal Site

Dr. Yildirim Tosun

Sirnak University, Engineering

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This study investigated the heavy metal contamination by cadmium and lead metals and sulfur and arsenic for the Geothermal site and alluvial soil tract in the Belkızana Spa in Güçlükonak, Ilisu Dam, Şırnak city of Turkey and in the surrounding rural districts. Due to naturally occurring organic matter in the sediments, the groundwaters are anoxic and rich in iron. With an average arsenic concentration of 51 µg/L, the contamination levels varied from 33 to 51 µg/L in rural groundwater samples from private smallscale tubewells. In a highly affected dam area, the groundwater used directly as drinking water had an average concentration of 3 µg/L. Analysis of raw groundwater pumped from the lower aquifer for the Dicle river water supply yielded arsenic levels of 20-30 µg/L in a treatment study and 7-8 µg/L in another carbon treatment study. Aeration and carbon filtration that are applied in the pilot plants for iron removal lowered the arsenic concentrations to levels of 2-2,1 µg/L. The sediment samples from three bore wells showed a lower arsenic and iron contents. The arsenic in the sediments may be associated with iron oxyhydroxides and released to the groundwater by reductive dissolution of iron. Oxidation of sulfide phases could also release arsenic to the groundwater, but sulfur concentrations in sediments were high 31 mg/g. The high arsenic concentrations found in the tubewells (8 % above 5 µg/L and 2 % above 15 µg/L) indicate that several million people consuming untreated groundwater might be at a considerable risk of chronic arsenic poisoning.