

Groundwater Quality Assessment in the Vicinity of Tannery Industries in Warangal, India

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Abstract : Groundwater quality is deteriorating day by day in different parts of the world due to various reasons, toxic chemicals are being discharged without proper treatment into inland water bodies and land which in turn add pollutants to the groundwater. In this kind of situation, the rural communities which do not have municipal drinking water have to rely on groundwater though it is polluted for various uses. Tannery industry is one of the major industry which provides economy and employment to India. Since most of the developed countries stopped using chemicals which are toxic, the tanning industry which uses chromium as its major element are being shifted towards developing countries. Most of the tanning industries in India can be found in clusters concentrated mainly in states of Tamilnadu, West Bengal, Uttar Pradesh and limited places of Punjab. Limited work is present in the case of tanneries of Warangal. There exists 18 group of tanneries in Desaipet, Enamamula region of Warangal, out of which 4 are involved in dry process and are low responsible for groundwater pollution. These units of tanneries are discharging their effluents after treatment into Sai Cheruvu. Though the treatment effluents are being discharged, the Sai Cheruvu is turned in to Pink colour, with higher levels of BOD, COD, chromium, chlorides, total hardness, TDS and sulphates. An attempt was made to analyse the groundwater samples around this polluted Sai Cheruvu region since literature shows that a single tannery can pollute groundwater to a radius of 7-8 kms from the point of disposal. Sample are collected from 6 different locations around Sai Cheruvu. Analysis was performed for determining various constituents in groundwater such as pH, EC, TDS, TH, Ca+2, Mg+2, HCO₃⁻, Na⁺, K⁺, Cl⁻, SO₄²⁻, NO₃⁻, F and Cr+6. The analysis of these constitutes gave values greater than permissible limits. Even chromium is also present in groundwater samples which is exceeding permissible limits People in Paidepally and Sardharpeta villages already stopped the usage of groundwater. They are buying bottle water for drinking purpose. Though they are not using groundwater for drinking purpose complaints are made about using this water for washing also. So treatment process should be adopted for groundwater which should be simple and efficient. In this study rice husk silica (RHS) is used to treat pollutants in groundwater with varying dosages of RHS and contact time. Rice husk is treated, dried and place in a muffle furnace for 6 hours at 650°C. Reduction is observed in total hardness, chlorides and chromium levels are observed after the application RHS. Pollutants reached permissible limits for 27.5mg/l and 50 mg/l of dosage for a contact time of 130 min at constant pH and temperature.

Keywords : chromium, groundwater, rice husk silica, tanning industries

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