



**Quality Evaluation of Subsurface Waters near an Industrial Effluent Stream  
by Physicochemical and Microbial Characterization for Assessing  
their Potential for Application**

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Received on 14<sup>th</sup> September and finalized on 18<sup>th</sup> September 2013.

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**ABSTRACT**

*The present proposed research study is to characterize the subsurface water samples collected from ten rural locations near an industrial effluent stream flowing between Peddapuram and Kakinada revenue divisions of East Godavari district for evaluating their quality. The subsurface water samples collected during pre monsoon and post monsoon seasons were characterized for physicochemical parameters such as pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Total Hardness (TH), Total Alkalinity (TA), Carbonate, Bicarbonate alkalinities,  $Ca^{+2}$ ,  $Mg^{+2}$ , Na, K, Cl,  $SO_4^{-2}$  and  $PO_4^{-3}$  to assess their quality for end use application. Most of the parametric values of many subsurface water samples exceeded the permissible limits of drinking water standards of IS: 10500-1992 indicating the unsuitability of these subsurface waters for drinking as well as domestic application. Irrigation standard parameters like Percent Sodium(%Na), Sodium Adsorption Ratio (SAR), Residual Sodium Carbonate (RSC), Kelly' Ratio(KR), Magnesium Hazard (MH) were also calibrated and the parametric levels are within the permissible limits of irrigation standards and the results confirmed that majority of subsurface waters were suitable for irrigation purposes. Microbial analysis of these subsurface waters also confirmed the presence of bacterial species viz., E.coli, Proteus, Pseudomonas, Klebsiella and Enterobactor indicating the bacterial contamination and hence these waters can cause concern on human health if consumed for drinking purposes.*

**Keywords:** Subsurface Water, Parameter, Irrigation, Bacteria, Contamination.

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