

Benthal Sludge Stabilization in the River Ganga at Kanpur : Part I - Field Observations

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Field observations were conducted at Kanpur to analyze the ration of biochemical oxygen demand (BOD) contributions by benthal sludge to the overlying waters of the river Ganga. This data was later correlated to the data obtained under different conditions of operating and process variables in the laboratory. Observations were made at 3 sections along the river downstream of an outfall discharging partially treated wastewater. The rate of BOD contribution by benthal sludge to the overlying waters was estimated by utilizing the observed values of dissolved oxygen (DO) and BOD and is presented in Part 2 of this paper. The rate of BOD contribution was higher at section A during summer and at section B during winter, throughout the depth of overlying waters. This is because of the higher stabilization of the settled organic matter during summer. In winter, the BOD released gets carried away to the downstream sections. The rate of BOD contributions (expressed as a percentage of the BOD remaining in the top benthal sludge layers) was insignificant during winter. The rate of BOD contribution (expressed as a percentage of the BOD added continuously) was higher at sections closer to the outfall during summer, but higher at section B in winter. Predictive models were developed for the rate of BOD contribution by benthal sludge. The observations in the laboratory were done on a significantly smaller model and the field data differed by an order of magnitude. Models were developed to predict the overall scale factor (OSF) for different field conditions by benthal sludge by using the laboratory models.

Ground and Surface Water Quality in Nayagard-Khurda Districts With Stastistical Interpretation for the Year-2009-10

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More than 90% of rural people use ground water for domestic and drinking purposes. As quality of drinking water is directly related to quality of public health, an attempt has been made to collect in-depth analysis about different parameters in surface and ground water of Nayagard-Khurda districts for which 16 different locations were chosen to cover all parts of Nayagard-Khurda districts. The samples were collected quarterly in the rainy, winter and summer season of the year 2009-10 to determine different physical, chemical and biological parameters. The seasonal variations of different parameters have been compared with the standards. It was found that most of the samples contain high amount of fluoride alongwith TDS and T.Cr. From the results mean, standard deviation and

correlation coefficients among different parameters have been studied. It was observed that 21 no. of correlation coefficients are considered to be correlated by taking correlation coefficient more than 0.5 to 1.0. but 13 no. of correlation coefficients are considered to be highly correlated by taking correlation coefficient 0.7 to 1.0. From the correlation study it was found that pH is correlated with fluoride; turbidity is correlated with total iron; conductivity is correlated with total dissolved solid (TDS); total dissolved solid is correlated with total hardness, chloride, sulphate, cadmium and nickel; total hardness is correlated with chlorides, sulphates, cadmium and nickel; chloride is correlated with sulphate and cadmium; sulphate is correlated with cadmium and nickel.

Preparation of New Activated Kaza's Carbons and Their Application in Defluoridation of Drinking Water of Nujendla Mandal, Guntur District, A.P.

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The permissible level of fluoride in drinking water is 1.5 ppm as per WHO standards. Now a days activated carbons are using as one of the adsorbent towards fluoride. Activated Kaza's carbons are prepared from *Bergera koenigh* (curry leaf seeds), BKC; *Batavia orang*, BOC; *Raphanus sativus* (garden raddish), RSC. The quality of water samples collected from Nujendla Mandel, Guntur district were determined. The fluoride content in this water ranges from 1.15 to 8.03 ppm. By using the prepared activated Kaza's carbon as adsorbents, the fluoride content in this water bring together normal allowed value.

Assessment of Bacteriological Quality of Ground Water in Eloor, Ernakulam District of Kerala

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Studies on the bacteriological quality of ground water samples in Eloor, Ernakulam district of Kerala was conducted during May 2010. A total of 30 water samples were collected and analyzed for various water quality parameters by adopting APHA standard methods and the parameters were compared with WHO standards. Present study revealed that bacteriological quality was not under acceptable level and 36 % of the samples were contaminated with coliforms. Chemical oxygen demand (COD) of

23 % of the samples exceeds the maximum limit prescribed by WHO. The results of bacterial diversity analysis indicated that in the tested ground water samples there exists various type of disease causing microorganisms, such as *E.coli*, *Enterobacter*, *Staphylococcus*, *Pseudomonas*, *Klebsiella*. From the analyzed water samples concerned, the potential risk of getting infected by water borne diseases is always there if used without proper purification.

Assessment of Groundwater Quality in Muddanur Mandal of Y.S.R. District, Andhra Pradesh

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The present study was undertaken to assess the water quality in relation to agriculture and domestic use in Muddanur mandal. The study area is mainly composed of Cuddapah Super Group of rocks. The important litho units consist of mainly quartzite, shale, limestone and some basic intrusives. The groundwater samples from the wells of the study area are collected and the chemical analysis for various parameters are carried out. The quality analysis is made through the estimation of silica, calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulphate, chloride, total dissolved solids, hydrogen ion concentration (pH) and specific conductance. Based on the analysis, certain parameters, like sodium adsorption ratio (SAR), percent sodium, residual sodium carbonate, Kelly's ratio, index of base exchange and permeability index were calculated. Assessment of water samples from various methods proved that majority of the water samples are good either for domestic or for agricultural purposes.

Phytoremediation of Cadmium and Nickel by *Spirodela polyrhiza*

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Heavy metal pollution in surface and groundwater has considerably increased in the last few years. It is essential to have an effective removal mechanism of these toxic metals. Current research includes the need to develop environment friendly and cost effective technologies for removing heavy metals from water. In several studies cadmium and nickel have been considerably removed using phytoremediation. The removal efficiency of cadmium and nickel by *Spirodela polyrhiza*, common duckweed has been examined in the present study for 3 different concentrations of cadmium (1, 2 and 3 mg/L) and nickel (4, 5 and 6 mg/L). Two sets of experiments for cadmium and nickel were

conducted separately. Effect of metal toxicity on *Spirodela polyrhiza* was evaluated in terms of relative growth factor and cadmium was found to be more toxic than nickel. Under experimental condition BCF value for cadmium removal was more than >1000 in all the 3 concentrations of cadmium. But the BCF value was found to be more than >1000 only when input nickel concentration was 4 mg/L during phytoremediation process. Experimental results suggest that *Spirodela polyrhiza* has the potential of accumulating cadmium and nickel from aqueous solution at lower metal concentration.

Effect of Waste Disposal on Water Quality of River Harmu in Ranchi City, Jharkhand

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Physico-chemical characteristics of water of the river Harmu at Ranchi were studied. Three sampling points were selected for the study. The parameters studied were pH, electrical conductivity, total dissolved solids, total suspended solids, total hardness, calcium hardness, magnesium hardness, alkalinity, chloride and dissolved oxygen. The concentrations of the parameters were found in excessive amounts. By observing the results it can be concluded that the parameters which were taken for present study the water quality parameters are above the pollution level for surface water which not satisfies the requirement for the use of various purposes.

Seasonal Variations of Water Quality of Urapakkam Town Near Chennai City

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An investigation was carried out to study the ground water quality of Urapakkam town. The study area is situated 80.0716 °E longitude. It is in Kancheepuram district in the Indian state of Tamil Nadu. The population was 13,446 at the 2001 Indian census. Urapakkam is the fastest growing town on Chennai southern suburb in Kancheepuram district. It is situated on the National Highway (NH45) which is part of 'Golden Quadrilateral' National Highway Project. It is situated 35 km from Chennai Central Railway Station and in between Tambaram and Chengalpattu. It is situated at a distance of 8 km from Tambaram and 20 km from Chengalpattu. The present work has been conducted by monitoring the bore well and the open well water of the town in 4 different sampling sites in different wards. Evaluation of the physico-chemical parameters, like pH, total dissolved solids, chloride, sulphate, iron, zinc, fluoride, alkalinity, temperature, total hardness, total coliform were studied and each parameter was compared with the standard limit of that parameter in the drinking water as prescribed by ISO 10500. A systematic calculation was made to determine the correlation coefficient

'r' amongst the parameters and the significant values of the observed correlation between the parameter were worked out. By observing the result it can be conducted that the parameters which were taken from the sampling sites are above the desirable limit but within the tolerance level of the ground water which satisfy the need for the use of the water for various purposes, like domestic, agricultural and industrial activities.

Suitability Assessment of Groundwater for Drinking and Irrigation Use in Palacode Area of Dharmapuri District, Tamil Nadu

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The study comprised suitability assessment of groundwater for drinking, irrigation and livestock use. Groundwater samples from selected bore wells. A total of 25 groundwater samples were collected at different locations from Palacode area of Dharmapuri district, Tamil Nadu, were analyzed for important physio-chemical attributes by adopting APHA standard methods. Physio-chemical characterization of the samples revealed that groundwater from most of the sources was not fit for drinking owing to a high concentration of hardness, fluoride, nitrate and chloride. Irrigation water classified based on SAR and RSC alone indicate that the water samples belong to good category. Graphical representation of the chemical data on the irrigation suitability diagram shows that most of water samples are moderate water except few samples falls in poor water. It is inferred from the study that these water sources was not fit for drinking and cooking but with certain affordable ameliorations at household level it could be made fit for other domestic purposes, such as bathing, washing and gardening. The high concentration of the chemical constituents is attributed to the lithologic composition of the area.

Analysis of Intrusion of Wastewater From Coconut Wastages Into Ground Water in Kanyakumari Coastal Region, Tamil Nadu

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