

THE GENESIS AND BRACKISH WATER TREATMENT AS A CLEAN WATER IN DEMANGAN VILLAGE, KARANGDOWO SUBDISTRICT, KLATEN DISTRICT, CENTRAL JAVA PROVINCE

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Abstract

Water is the main source for all living creatures in the world. The problems of clean water in Demangan Village was the residents can not consume the groundwater because of the groundwater taste brackish. The brackish water makes local people worried about their health. The purpose of this research were to find out the genesis of brackish groundwater, the treatment using zeolite as a media, and the right treatment of brackish groundwater to fulfill the needs of fresh water source in Demangan Village.

The methods used in this research were survey and mapping, mathematical, interview, laboratory analysis, experiment. The analysis was used to determined the cause of the brackish spring include drilling data analysis, analyze of the Trilinier Piper Diagram, and analysis of the quality of spring. Physical parameters that being used to determine the quality of groundwater in the research area are DHL and TDS, while the chemical parameters tested are pH, K, Na, Ca, Cl, Mg, SO₄, HCO₃, salinity, hardness as CaCO₃ with reference of PerMenKes No.416/MENKES/PER/IX/1990 tentang Syarat-syarat dan Pengawasan Kualitas Air. The water treatment method used was fixed-bed with operating system semi batch. the adsorption method. The process is made with 2 different grain sizes which are 0,2 cm and 0,5 cm with a residence time of 75 minutes.

Based on research result, brackish groundwater is formed due to trapped ancient sea water, that is evidenced by the dominant of NaCl content in the Trilinier Piper Diagram. The effectiveness maximum of natural zeolite media with grain size of 0,2 cm in the removing TDS, DHL, potassium, chloride, sodium, salinity, calcium bicarbonate, and hardness parameters respectively 45,03 %, 36,74 %, 42,86 %, 5,05 %, 63,56 %, 22,22 %, 20,53 %, 47,76 %, and 20,66 %.. The effectiveness maximum of natural zeolite media with grain size of 0,5 cm in the removing TDS, DHL, potassium, chloride, sodium, salinity, calcium bicarbonate, and hardness parameters respectively 41,80 %, 35,23 %, 28,57 %, 4,20 %, 60,09 %, 22,22 %, 15,87 %, 25,72 %, and 15,37 %. Based on these result, the brackish water still exceeds the quality standard. Direction of the management suggested that using the zeolite filter grain size of 0,2 cm with modifications chemical activation.

Keywords: Brackish Groundwater, Zeolite Adsorption, Trilinier Piper Diagram