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Analysis of Ground Water Quality in the Waste Disposal Landfill Area of Kulo, Tondano, North Sulawesi

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Abstract : Abstract: One of the land usages is waste disposal landfill activities, but its presence often results in problem. This facility is needed, and at the same time it is unwanted. The problem is the landfill site occurs in the area that hydrogeologically susceptible to environmental pollution potential. Beside the effluent is very potential to cause water pollution, both groundwater or surface water, the distance between the water spring and the drainage channels of the waste landfill is less than 100 m. This study was carried out in Kulo village, Tondano, Minahasa Regency, North Sulawesi Province. The waste landfill has been running since 2008 with an area of 3 Ha, and the landfill area used is still 1.3 Ha. This study was aimed at analyzing the groundwater quality and the groundwater microbiology around the waste landfill of Kulo, Tondano, using the water quality standard based on the regulation of Indonesian Republic Health Minister numbered 416/ 1990. It applied survey method, field pobservation, and laboratory analysis. Groundwater quality and microbiological parameters measured were pH, BOD, COD, TDS, TSS, NH3-N, NO3-N, N-NO2, Fe, Mn, Zn, Al, total *coliform*, and *colitinja*. Results showed that 8 of 12 tested parameters met the allowable quality standard, pH (7.2), TSS (7.6 mg/L), TDS (328.4 mg/L), nitrate (5.074 mg/L), nitrite (0.610 mg/L), Mn (tt*), Zn (0.021 mg/L), and Al (tt*). Nevertheless, some of these parameters were still below the quality standard, so that this condition should be considered. In contrast, 4 parameters, Ammonia-N-NH3 (1.899 mg/L), Fe (0.349 mg/L), *Total coliform*, (21 MPN/100 ml) and colitinja (7 MPN/100 ml), did not meet the quality standard of Health Minister's Regulation numbered 416/1990 concerning clean water quality requirements. The groundwater parameters exceeding the quality standard need further water treatment before consumption. This study also found that distance between the water spring and the drainage channels of the waste landfill was only 65 m. This situation needs to be considered in site selection due to its potentiality to high risk. Therefore, efforts to improve the waste landfill site management are needed in order to avoid more severe groundwater contamination.
Keywords : landfill**,** groundwater, effluent, groundwater chemicals.

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