

Intisari

Penelitian ini bertujuan untuk menganalisis pengaruh keberadaan Tempat Pembuangan Akhir (TPA) Troketon terhadap parameter fisika, kimia dan biologi pada air dan tanah di sekitarnya. Lokasi penelitian berada di sekitar TPA Troketon dengan pengambilan sampel tanah dan air pada beberapa titik yang berjarak 0 meter, 500 meter, dan 1500 meter dari sumber limbah, serta titik kontrol di kanan dan kiri lokasi. Sampel tanah yang diambil berjumlah 30 sampel, sementara sampel air diambil dari kolam pengolahan limbah, embung penampung limbah, sumur pantau, sumur warga, dan sungai di berbagai jarak pengamatan. Parameter kualitas tanah yang diukur meliputi pH H₂O, pH KCl, Daya Hantar Listrik (DHL), Kapasitas Pertukaran Kation (KPK), logam berat timbal (Pb), karbon organik (C organik), bahan organik (BO), total coliform, dan nitrogen total (N total). Sementara itu, parameter air yang dianalisis meliputi pH, DHL, Chemical Oxygen Demand (COD), Pb, nitrat, total coliform, Total Dissolved Solids (TDS), dan Total Suspended Solids (TSS). Hasil penelitian menunjukkan adanya pengaruh signifikan limbah TPA terhadap parameter fisika, kimia dan biologi pada tanah dan air di sekitar area penelitian. Terdapat peningkatan kandungan logam berat Pb serta bakteri total coliform di beberapa titik pengambilan sampel yang berdekatan dengan TPA. Parameter fisika, kimia dan biologi pada air dan tanah cenderung menurun seiring dengan jarak yang semakin dekat dari sumber limbah, terutama pada parameter pH, DHL, dan kandungan logam berat. Hal ini mengindikasikan adanya pencemaran lingkungan yang berdampak pada kualitas ekosistem di sekitar TPA Troketon. Penelitian ini diharapkan dapat menjadi dasar bagi pengambilan kebijakan dalam pengelolaan limbah serta upaya mitigasi dampak lingkungan.

Kata kunci: TPA Troketon, Sifat Fisika, Kimia dan Biologi pada Tanah dan Air

Abstract

This research aims to analyze the impact of the Troketon Landfill (TPA) on the physical, chemical and biological properties of surrounding soil and water. The research was conducted around the Troketon Landfill, with soil and water samples collected at several points located 0 meters, 500 meters, and 1500 meters from the waste source, as well as control points on the right and left of the sampling area. A total of 30 soil samples were collected, while water samples were taken from the waste treatment pond, the waste storage reservoir, monitoring wells, local wells, and rivers at various distances. The soil physical, chemical and biological properties parameters measured include pH H₂O, pH KCl, Electrical Conductivity (EC), Cation Exchange Capacity (CEC), heavy metal lead (Pb), organic carbon (C-organic), organic matter (OM), total coliform, and total nitrogen (N-total). Meanwhile, the analyzed water parameters include pH, EC, Chemical Oxygen Demand (COD), Pb, nitrate, total coliform, Total Dissolved Solids (TDS), and Total Suspended Solids (TSS). The results show a significant influence of the landfill waste on the soil and water physical, chemical and biological properties around the research area. There is an increase in heavy metal lead content and total coliform bacteria in several sampling points closer to the landfill. Soil and water physical, chemical and biological properties tend to degrade as the proximity to the waste source decreases, particularly in the parameters of pH, EC, and heavy metal content. These findings indicate environmental contamination that negatively impacts the ecosystem surrounding the Troketon Landfill. This study is expected to serve as a foundation for policymaking in waste management and environmental impact mitigation efforts.

Keywords: Troketon Landfill, Physical, Chemical and Biological properties of Soil and Water