

**STATUS MUTU AIRTANAH SEKITAR PETERNAKAN KAMBING DAN
ARAHAN PENGELOLAANNYA DI PADUKUHAN GROGOLAN,
KALURAHAN UMBULMARTANI, KAPANEWON NGENEMPLAK,
KABUPATEN SLEMAN, DAERAH ISTIMEWA YOGYAKARTA**

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INTISARI

Limbah merupakan hasil dari semua kegiatan manusia, termasuk limbah peternakan kambing yang sering kali tidak memiliki pengelolaan yang memadai sehingga berpotensi mencemari lingkungan, khususnya airtanah. Penelitian ini bertujuan untuk menganalisis kualitas airtanah di sekitar peternakan kambing di Padukuhan Grogolan, Kalurahan Umbulmartani, Kapanewon Ngemplak, Kabupaten Sleman, Yogyakarta, menggunakan metode penentuan status mutu air, serta mengevaluasi dampak terhadap parameter kualitas air, seperti *Total Suspended Solids* (TSS), *Biological Oxygen Demand* (BOD), *Chemical Oxygen Demand* (COD), dan pH. Hasil penelitian diharapkan dapat merumuskan arahan pengelolaan limbah yang efektif untuk meminimalkan pencemaran lingkungan..

Metode penelitian meliputi survei lapangan, pengumpulan data primer dan sekunder, analisis laboratorium, serta pendekatan kuantitatif dan kualitatif. Teknik sampling purposive digunakan untuk pengambilan sampel air limbah, airtanah, dan air sungai. Data yang dianalisis mengacu pada baku mutu air dari peraturan terkait. Analisis status mutu airtanah digunakan untuk mengevaluasi tingkat pencemaran, sedangkan rancangan pengelolaan berbasis teknologi IPAL (Instalasi Pengolahan Air Limbah) dirancang dengan metode *Constructed Wetland* menggunakan tanaman cattail (*Typha spp.*).

Hasil penelitian menunjukkan bahwa kualitas airtanah berdasarkan nilai Indeks Pencemaran (IP) tergolong memenuhi baku mutu dengan nilai IP sebesar 0,487 ($0 < IP \leq 1$). Nilai parameter yang dihasilkan adalah BOD sebesar 1,4 mg/L (di bawah ambang batas 2 mg/L), COD sebesar 7,7 mg/L (di bawah ambang batas 10 mg/L), TSS sebesar 2 mg/L (melebihi ambang batas 0 mg/L), dan pH sebesar 6,8 (masih dalam rentang 6–8,5).

Arahan pengelolaan meliputi pembangunan IPAL komunal berbasis *constructed wetland* dengan tanaman cattail (*Typha angustifolia*) yang berukuran 7x3 meter. *Constructed wetland* ini efektif dalam menurunkan BOD, COD, TSS, dan menstabilkan pH. Pendekatan ini diharapkan dapat menjaga kualitas airtanah dan menjadi acuan pengelolaan limbah peternakan secara berkelanjutan.

Kata Kunci: airtanah, limbah peternakan, kualitas air, *constructed wetland*, IPAL.

**WATER QUALITY STATUS OF GROUNDWATER AROUND GOAT FARMING
AND MANAGEMENT GUIDELINES IN GROGOLAN VILLAGE,
UMBULMARTANI SUB-DISTRICT, NGEMPLAK DISTRICT, SLEMAN
REGENCY, SPECIAL REGION OF YOGYAKARTA**

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ABSTRACT

Waste is a byproduct of all human activities, including goat farming, which often lacks adequate waste management and has the potential to pollute the environment, particularly groundwater. This study aims to analyze the quality of groundwater around goat farms in Grogolan Village, Umbulmartani Sub-District, Ngemplak District, Sleman Regency, Yogyakarta, using a water quality status determination method. It also evaluates the impact on water quality parameters, such as Total Suspended Solids (TSS), Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), and pH. The results are expected to formulate effective waste management strategies to minimize environmental pollution.

*The research methods included field surveys, primary and secondary data collection, laboratory analysis, and both quantitative and qualitative approaches. Purposive sampling techniques were employed for collecting wastewater, groundwater, and river water samples. The data were analyzed based on water quality standards from relevant regulations. Groundwater quality status analysis was used to evaluate pollution levels, while a wastewater management design based on IPAL (Wastewater Treatment Plant) technology was developed using a constructed wetland method with cattail plants (*Typha* spp.).*

The results indicated that groundwater quality, based on the Pollution Index (PI) value, meets the quality standards with a PI value of 0.487 ($0 < PI \leq 1$). The measured parameter values include BOD of 1.4 mg/L (below the threshold of 2 mg/L), COD of 7.7 mg/L (below the threshold of 10 mg/L), TSS of 2 mg/L (exceeding the threshold of 0 mg/L), and pH of 6.8 (within the range of 6–8.5).

*The management direction involves the construction of a communal wastewater treatment plant (WWTP) based on a constructed wetland system utilizing cattail plants (*Typha angustifolia*), with dimensions of 7x3 meters. This constructed wetland is effective in reducing BOD, COD, TSS, and stabilizing pH levels. This approach is expected to maintain groundwater quality and serve as a reference for sustainable livestock waste management practices..*

Keywords: *groundwater, livestock waste, water quality, constructed wetland, WTP*