

PERHITUNGAN NERACA AIR WADUK DIDALAM PENENTUAN KEBUTUHAN AIR PADA KAMPUS 1 POLITEKNIK NEGERI BENGKALIS

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Abstrak

Ketersediaan air yang memadai merupakan faktor penting dalam mendukung aktivitas akademik dan operasional di lingkungan perguruan tinggi, termasuk Politeknik Negeri Bengkalis. Seiring meningkatnya jumlah pengguna fasilitas kampus seperti mahasiswa, dosen, dan staf, kebutuhan akan sistem suplai air yang efisien dan berkelanjutan menjadi semakin mendesak. Penelitian ini bertujuan menghitung neraca air Waduk Politeknik Negeri Bengkalis dan menganalisis kecukupan air bersih bagi kebutuhan kampus menggunakan metode Thornthwaite-Mather. Survei topografi dengan metode poligon tertutup digunakan untuk menghitung luas tampungan waduk, sedangkan data curah hujan dan penguapan dikumpulkan sebagai input dalam analisis neraca air.

Hasil perhitungan menunjukkan bahwa volume tampungan eksisting waduk belum mampu memenuhi kebutuhan air kampus secara optimal, terutama pada musim kemarau. Oleh karena itu, direkomendasikan strategi distribusi air berdasarkan prioritas penggunaan dan ketersediaan air bulanan, dengan gedung GKT 1, GKT 2, GKT 3, Dan GKT 4 sebagai prioritas utama suplai, sedangkan Gedung C menerima sisa distribusi sesuai kapasitas yang tersedia setelah kebutuhan utama terpenuhi.

Kata kunci: Neraca Air, Waduk, Curah Hujan, *Evapotranspirasi*, *Thornthwaite-Mather*, Kebutuhan Air Bersih.

WATER BALANCE CALCULATION OF THE RESERVOIR IN DETERMINING WATER DEMAND AT CAMPUS 1 STATE POLYTECHNIC OF BENGKALIS

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Abstract

Adequate water availability is a crucial factor in supporting academic and operational activities in higher education institutions, including state polytechnic of bengkalis. As the number of campus facility users such as students, lecturers, and staff increases, the need for an efficient and sustainable water supply system becomes more urgent. This study aims to calculate the water balance of the Politeknik Negeri Bengkalis reservoir and analyze the adequacy of clean water for campus needs using the Thornthwaite-Mather method. A topographic survey with the closed polygon method was conducted to calculate the reservoir storage area, while rainfall and evaporation data were collected as inputs for the water balance analysis.

The calculation results indicate that the existing reservoir storage volume is insufficient to meet campus water needs optimally, especially during the dry season. Therefore, a water distribution strategy is recommended based on usage priority and monthly water availability, with GKT 1, GKT 2, GKT 3, and GKT 4 designated as the main supply priorities, while Building C receives the remaining distribution according to the available capacity after the primary needs are met.

Keywords *Water Balance, Reservoir, Rainfall, Evapotranspiration, Thornthwaite-Mather, Clean Water Demand.*