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Laporan Tugas Akhir

DED INSTALASI PENGOLAHAN AIR MINUM (IPA) SUNGAI WELO PERUMDA AIR MINUM TIRTA KAJEN KABUPATEN PEKALONGAN

Disusun oleh:

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FAKULTAS TEKNIK

UNIVERSITAS DIPONEGORO

SEMARANG

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HALAMAN PENGESAHAN

Menyatakan bahwa Laporan Tugas Akhir yang berjudul :

DED Instalasi Pengolahan Air Minum (IPA) Sungai Welo Perumda Air Minum Tirta Kajen Kabupaten Pekalongan

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ABSTRAK

Berdasarkan hasil pendataan penduduk pada tahun 2020, jumlah penduduk Kabupaten Pekalongan tercatat sebesar 968,821 jiwa dengan pertumbuhan penduduk sebesar 1,53% dalam satu tahun terakhir. Hal tersebut memicu peningkatan kebutuhan air minum dan dibutuhkan pemanfaatan pengolahan air permukaan yang baru untuk bisa memenuhi kebutuhan tersebut. Perencanaan Detail Engineering Design (DED) Instalasi Pengolahan Air Minum (IPA) Perumda Air Minum Tirta Kajen Kabupaten Pekalongan sumber air baku Sungai Welo direncanakan dengan kapasitas 50 liter/detik sehingga bisa memenuhi baku mutu Permenkes RI No. 492/Menkes/Per/IV/2010. Parameter yang ditemukan tidak memenuhi baku mutu antara lain: Kekeruhan (5,78 NTU), Warna (134,33 Pt-Co), Zat Organik (28,44 mg/L) dan E.Coli dan total bakteri coliform (>300/100 ml). IPA Welo terletak di Kecamatan Doro akan melayani kebutuhan air minum di sepuluh desa dari Kecamatan Doro, Kedunguni dan Karangdadap dengan persentase sebesar 60% masyaratak terlayani. Intake yang digunakan berupa *shore intake* dengan bendung. Sistem pengolahan yang digunakan menggunakan sistem *high-rate* dengan unit pengolahan antara lain: koagulasi (static-mixer), pre-klorinasi (pembubuhan klorin), flokulasi (vertical baffle), sedimentasi (plate settler), filtrasi (dualmedia filter), desinfeksi (gas klor). Sedangkan pengolahan lumpur menggunakan *sludge holding tank*, *thickener*, dan *filter press*. Total kebutuhan lahan yang dibutuhkan dalam perencanaan seluruh unit adalah seluas 0,4 Ha. Pengoperasian dan pemeliharaan diambil dan didasarkan pada Permen PU-PR No. 26 tahun 2014 tentang prosedur operasional standar pengelolaan sistem penyediaan air minum serta didasarkan juga pada SNI 6774:2008 tentang tata cara pengoperasian dan pemeliharaan unit pake instalasi pengolahan air. Pengoperasian dilakukan dalam tiga (3) shift. Biaya pembangunan Instalasi Pengolahan Air (IPA) Welo beserta penunjangnya sebesar Rp19.659.810.510,00. Sedangkan biaya operasional setiap harinya adalah sebesar Rp5.630.010,41.

Kata Kunci : Air Minum, Pengolahan Air, Kabupaten Pekalongan

ABTRACT

Based on the results of population data collection in 2020, the population of Pekalongan Regency was recorded at 968,821 people with a population growth of 1.53% in the past year. This triggers an increase in the demand for drinking water and the use of new surface water treatment plants is needed to meet these needs. Planning Detailed Engineering Design (DED) for Drinking Water Treatment Plant (IPA) of Perumda Tirta Kajen Pekalongan Regency, the raw water source of the Welo River is planned with a capacity of 50 liters/second so that it can meet the quality standards of the Minister of Health of the Republic of Indonesia No. 492/Menkes/Per/IV/2010. The parameters found that did not meet the quality standards included: Turbidity (5.78 NTU), Color (134.33 Pt-Co), Organic Substances (28.44 mg/L) and E.Coli and total coliform bacteria (>300/L). 100 ml). IPA Welo, located in Doro District, will serve drinking water needs in ten villages from Doro, Kedunguni and Karangdadap sub-districts with a percentage of 60% of the community being served. The intake used is a shore intake with a weir. The treatment system used uses a high-rate system with processing units including: coagulation (static-mixer), pre-chlorination (chlorine application), flocculation (vertical baffle), sedimentation (plate settler), filtration (dual media filter), disinfection (chlorine gas). Meanwhile, sludge treatment uses a sludge holding tank, thickener, and filter press. The total land requirement required in the planning of all units is 0.4 Ha. Operation and maintenance are taken and based on the Minister of Public Works and Public Housing No. 26 of 2014 concerning standard operating procedures for the management of drinking water supply systems and is also based on SNI 6774:2008 concerning procedures for operating and maintaining units using water treatment installations. Operations are carried out in three (3) shifts. The cost of constructing the Welo Water Treatment Plant (IPA) and its supports is Rp. 19,659,810,510.00. Meanwhile, the daily operational cost is IDR 5,630,010.41.

Keywords: Drinking Water, Water Treatment, Pekalongan Regency.