# Perancangan Sistem Pengolahan Air Bersih untuk Melayani Fakultas Ilmu Keperawatan Universitas Indonesia dengan Slow Sand Filter Bermediakan Pasir Silika dan Karbon Aktif yang Efektif dalam Menghilangkan Parameter Besi, Mangan, dan Fekal Koliform = The Design of Water Treatment System Contains Slow Sand Filter with Silica Sand and Activated Carbon Known Effective to Reduce Iron, Manganaese, and Fecal Coliform Concentration to Serve the Faculty of Nursing in University of Indonesia

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Abstrak

Water is one of the very necessary essence in human life aspects, which education is being one of them. As one of the best universities in Indonesia, University of Indonesia provides and find some ways to save clean water by minimizing the use amount of it, especially to reduce groundwater uses, as its noted in the UI GreenMetric purpose of clean water category. However, one of the faculties in UI, which is the Faculty of Nursing (FIK UI), have used a massive amount of groundwater in 2018 and 2019, with the amount number being 2.115.240 litres and 2.010.960 litres respectivel. FIK UI must find an alternative of water source other than groundwater, such as surface water. The purpose of this research is to design a water treatment system using the Agathis UI Lake water as the source to serve FIK UI need of clean water until 2042. The operation unit being the main focus of this designing process is the filtration using slow sand filter with silica sand and granular activated carbon as the filter medias, which both known effective to reduce iron, manganese, and fecal coliform concentration in raw water as the three parameters are important criterias in the Indonesias Health Minister Rule number 492 year 2010 about The Criterias of Drinking Water Quality. The amount of clean water need of FIK UI projected is 2,82 L/s. This design based on literatures and legal standards, especially in deciding the removal efficiency of the three parameters being said before of the slow sand filter. Based on the review of literatures, journals, and experiment results being done by others, the slow sand filter of this water treatment design can reach the removal efficiency of iron, manganese, and fecal coliform by 95,07%; 97,09%; and 99% respectively if the filter have 60 cm thick of silica sand above and 40 cm of granular activated carbon underneath the sand. One intake unit, two suction wells with two centrifugal pumps, one conveyance system, two slow sand filter units, one disinfection and reservoir unit, and two filter media cleaning units created to produce 3,8 L/s of clean water for FIK UI until 2042.