Perancangan sistem pengolahan lumpur Instalasi Pengolahan Air Minum (IPAM) Citayam Kota Depok = Design of sludge treatment system in Citayam drinking water treatment plant Depok City

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Abstrak

Instalasi pengolahan air minum (IPAM) Citayam dalam proses pengolahannya akan menghasilkan residu berupa lumpur (sludge). Menurut beberapa peraturan disebutkan bahwa penyelenggaraan SPAM (Sistem Pengolahan Air Minum) melaksanakan penyelenggaraan sanitasi seperti pengolahan limbah untuk mencegah pencemaran Air Baku dan menjamin keberlanjutan fungsi penyediaan Air Minum. IPAM Citayam yang belum melakukan pengolahan limbah dari proses pengolahan air minum, melainkan hanya melakukan pembuangan secara langsung ke sungai Ciliwung. Tujuan dari penelitian ini untuk menganalisa karakteristik lumpur serta merencanakan instalasi pengolahan lumpur.
Dari hasil analisa karakteristik lumpur, maka akan direncanakan beberapa alternatif sistem pengolahan lumpur yang kemudian akan dipilih dengan analisa SWOT, metode Expert Judgment, dan metode AHP (Analytical Hierarchy Process). Dengan debit instalasi sebesar 120 L/detik, IPAM Citayam menghasilkan jumlah timbulan massa lumpur sebesar 1353,81 kg/hari dan timbulan volume lumpur sebesar 283,15 m3/hari.
Berdasarkan karakteristik lumpur serta hasil pemilihan alternatif maka dipilih sistem pengolahan lumput yang terdiri dari 1 bak ekualisasi, 1 unit gravity thickener, 1 unit chemical conditioner, dan 1 unit belt filter press. Hasil pengolahan berupa dry cake lumpur akan dibuang ke landfill dan supernatan akan di resirkulasi menuju unit pengolahan air minum yaitu unit koagulasi.
<hr>Water treatment plant (WTP) Citayam produced sludge in a large quantity. According to several regulations, it is stipulated that the implementation of SPAM carries out sanitation operations such as waste management to prevent raw water pollution and ensure the sustainability of drinking water supply functions. The sludge generated from WTP Citayam is directly discharge into stream Ciliwung. The aim of this study is to analyze the characteristics of sludge and to plan for sludge treatment plant.
From the results of the analysis of sludge characteristics, several alternative sludge treatment systems will be planned which will then be selected by SWOT analysis, Expert Judgment method, and AHP (Analytical Hierarchy Process) method. With an installation discharge of 120 L/sec, WTP Citayam produced sludge is 1353.81 kg/day and 283.15 m3/day.
Based on three method, will be selected sludge treatment plant which has 1 equalization basins, 1 gravity thickener, 1 chemical conditioner, and 1 belt filter press. The processing results in the form of dry cake sludge will be discharged into landfills and the supernatant will be recirculated to the drinking water treatment unit, it is the coagulation unit.