

Nittiya Ngaonee 2011: H<sub>2</sub>S Removal in Full Scale Biotrickling Filter with UASB Effluent. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Associate Professor Patcharaporn Suwanvitaya, M.Appl.Sc. 69 pages.

Biogas from UASB system contains a small percentage of H<sub>2</sub>S which must be removed before the biogas can be utilized in electricity generation. H<sub>2</sub>S removal by biological process is successful in laboratories and in full scale reactors. This study investigated startup, performance, and recovery time of a full scale biotrickling filter in removing H<sub>2</sub>S from biogas. The biogas was obtained from UASB system treating wastewater from a starch production plant. The 3.5-m diameter and 8-m high reactor was packed with 70 m<sup>3</sup> plastic media. Biogas with 1,000 to 3,000 ppm H<sub>2</sub>S was mixed with air and was upwardly fed into the column at 400-850 m<sup>3</sup>/hr. UASB effluent was sprayed on top and trickled down the column at 20 m<sup>3</sup>/hr. Start up time of the system was 3-4 days, achieving 86.3 percent H<sub>2</sub>S removal. Loss of O<sub>2</sub> resulted in the decrease in removal percentage. The system could resist a short period (less than 10 hours) moisture loss. Performance failure of the system due to 1, 2 and 15 days complete shut down could be recovered within 4-5 days.

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