9th IWA Odour & VOC/Air Emission Conference
26-27 October 2021 Bilbao, Spain

ABSTRACT

STUDY OF ODOR REDUCTION IN SEWAGE SLUDGE BY APPLICATION OF LIME, IN AREQUIPA - PERU

Jose L. Valverde Ortiz, Jose Guzmán, Piero Chávez Velando

Summary

The management of sewage sludge in a Wastewater Treatment Plant (WWTP) is always an important issue to be managed, especially for the control of odor emanations in order to preserve the image of the WWTP to the community and workers. This case of study presents the experience of odor reduction in non-stabilized sludge from a municipal WWTP in the city of Arequipa, Peru.The WWTP is located on the suburbs of the city at four km. from the nearest neighborhood. According to Peruvian national regulations, a WWTP must be located at least 0.5 km from the nearest neighborhood. The WWTP is for municipal wastewater treatment, it has an average flow capacity of 1.8 m3/s. and its effluent is for reuse in a copper mine operation. This WWTP does not have an infrastructure for the digestion of sludge, so the sludge needs additional treatment to reduce odors. The plant is trickling filter technology with primary and secondary clarifiers. The primary sludge and secondary sludge are mixed in a Sludge Holding Tank and then pumped to the dewatering zone, where the sludge is dehydrated to 80% moisture to be transported by trucks 20 km. off-site by road to a drying bed for further treatment and final disposal. 320 Tn. 80% moisture sludge is transported and processed daily to the drying bed. The sludge is discharged into a 40,000 m2 concrete drying bed to be dried for about 22 days by solar irradiation. This infrastructure is located in an arid zone with very little rainfall. When the sludge reduces its humidity to 40%, it is moved towards a mono-fill for its final disposal. The alternative of applying lime to the sludge on the drying bed was chosen. Controls were performed for the pH, for the advance of sludge dryness and the reduction of odor was controlled by means of dynamic olfactometry. A parts per billion (ppb) scale VOC, H2S and NH3 gas detection equipment was used, as well as monitoring of a meteorological station to establish the environmental effects on the dispersion of these gases. A series of tests were performed to define the optimal dose of lime, the quality of lime, the procedures for mixing, the equipment for mixing, the storage and handling of lime. Odor levels at the beginning of the study were significantly high and are currently largely unnoticed outside the facility eliminating discomfort for drivers on the road and the community do not notice the facility.

Keywords: sewage-sludge, odor, WWTP, sludge-drying.

Motivation:

WWTP La Enlozada in Arequipa, Peru, is a success case of study due to the agreement between a private mining company and government. The company financed the construction of the WWTP for treatment of sewage of the city and pays for the operation of the plant to receive the treated effluent for the mining operations. It is very important the good perception of the community regarding the operation of the WWTP, and control of nasty odours is very important for good relations, even more, if nobody wants a WWTP near to their neighbourhood.

The conclusion is the good result to reduce odour perception using lime in the sludge. At the beginning of operation odours were very high perception and claims of community were a risk to continue the operation of the plant. With this study, odours have been reduced drastically, and perception of the community to the company are very good.

Indicate preference of kind of presentation

- ■ Oral Communication
- ☐ Poster

Indicate topic of your work for the conference:

- ☐ Policy and associated regulations for odour and air quality.
- ☐ Odour/VOC measurement, monitoring&sensor technologies.
- ☐ Odour/VOC perception, impact, formation and dispersion.
- ☐ GHG emissions particulate matter and industrial emissions.
- ☐ Source characterization and odour/VOC mapping.
- ☐ Odour/VOC abatement, mitigation and neutralization.
- ☐ Odour/VOC from waste water, sewer systems and livestock.
- ☐ Air emissions and sustainable solutions for waste handling
- ☐ Community engagement, social media and citizen action.
- ☐ Other (suggest a new topic):

The scientific committee can examine the kind of presentation and session where authors propose to include their works.