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

ABSTRACT

Impact Assessment of Odor Nuisance and Health Risk and Its Variations from Landfill Surface

Yan ZHANG [1,4], Xiaoyu NING [2,4], Yaohuang LI[3], Jianzhuang WANG[1], Huanwen CUI[5], Jie MENG[1,4], Changyun TENG[3], Gen WANG[2,4]

1 Tianjin Sinodour Environmental Technology Co., Ltd., Tianjin 300191, China

2 Tianjin Academy of Environmental Sciences, Tianjin 300191, China

3 GZEPI Environmental Service Co., Ltd., Guangzhou 510640, China

4 State Environmental Protection Key Laboratory of Odor Pollution Control, Tianjin 300191, China

5 Tianjin Gaojie Environmental Protection Technology Co., Ltd., Tianjin 300191, China

Many people worry that the public health from municipal solid waste (MSW) will threat their health and cause them to focus on odor pollution increasingly. However, the longtime assessment of odor nuisance and health risk impact of landfill gas in developing countries remain less understand.

In this work, five stages of the operational conditions were considered as an integral monitoring from beginning to the end process of the landfill surface in Guangzhou, China. Main compounds and odor concentration were measured on the site of opening membrane(OM), tipping(TA), capping membrane(CM), temporarily capped(TC) and land filling-up(LF), to identify the impact for the surrounding residents by an appropriate air dispersion model with two-year meteorological data. Differences of landfill surface geometry, such as emission height and source area and variations of residents living floors were taken into account in air dispersion model to illustrate the changes of odor nuisance effect and health risk impact. Odor nuisance of sensitive receptors and the separation distances were assessed by 98th percentile of hourly averages of odor concentration. Aromatics, halocarbons, and other chemicals under the toxic substances of USEPA were evaluated by the risks of carcinogenic, non-carcinogenic and cumulative effects for nearby residents, based on the annual average concentration of hazardous substances.

The results indicated that four of the eight sensitive receptors which were 2.6 km away from landfill surface were basically affected by the odor nuisance and the health risk. Dichloromethane had indelible and crucial impact to body health based on comprehensive investigation of aromatics, halocarbons, and other chemicals. Odor nuisance and health risk impact were significant nearby the landfill, and were remarkable factors in damaging the local environment. It is noticed that the study of olfactive and toxic environment impact should be useful for the management and control of landfill and further development of the city.

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.