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ABSTRACT

AN ODOUR ATTRIBUTION STUDY TO DETERMINE THE RELATIVE CONTRIBUTION FROM THREE FACILITIES FOR THE DEVELOPMENT OF REAL-TIME ODOUR MONITORING

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Summary
An Odour Attribution Study is undertaken in North America for an Air Quality Management Agency that includes gathering data from specific sources and ambient locations to better understand odour impacts within the local communities. Specifically, the following objectives were to be met:

- Identify odorant compounds impacting the area of concern via comprehensive quantitative and qualitative analyses;
- Determine the relative contribution and variability of the odorant compounds emitted from the three key source facilities;
- Develop a strategy for continuous real-time odorant monitoring to measure emissions impacting the community from the three key source facilities.

Odour has been an issue in this area for decades. Over the years, various odour mitigation approaches have been undertaken with varying degrees of success. While the number of odour complaints from residents has decreased in recent years from a peak of 3,500 in 2015, the high number of complaints (1,500) reported for 2018 indicates a persistent and ongoing odour issue. The odours in the area originate primarily from three closely located facilities including:

- A Waste Recycling Facility (including a waste recycling facility, a composting facility and a landfill)
- A Wastewater Treatment Facility
- An Anaerobic Organic Material Digestion Facility

The study approach goes beyond using the traditional, common practice of using odour threshold or odour intensity as the measure of odour nuisance. Instead, Weber-Fechner (persistency) curves were used as part of the Odor Profile Method (OPM) developed by Dr. Mel Suffet of the University of California-Los Angeles. The usefulness of the OPM lies in the fact that the human nose is, for the most important odorants, many degrees more sensitive than the standard chemical compound identification analytical methodologies. The approach was combined with comprehensive chemical compound identification analyses, field olfactometry sampling and well as a proton-

transfer reaction time-of-flight mass spectrometer (PTR-MS) to provide targeted measurements of specific VOCs to collect chemical fingerprints associated with the different sources. An improved understanding of the relative contribution of odour causing compounds from the three facilities and how they impact the local community was obtained to better:
1. inform future actions to reduce odours (best practices, enforcement, rules)
2. establish methods to measure progress on facilities' future odour reduction actions
3. educate community - on what's causing the odours, how complex they are and teach them how to characterize to better inform ongoing improvement efforts.

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 may change the session where authors propose to include their works.