

Odour Research Laboratory

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THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學



DEPARTMENT OF
CIVIL AND ENVIRONMENTAL ENGINEERING
土木及環境工程學系

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Introduction

The Odour Research Laboratory at Hong Kong PolyU was established in 1995 and specializes in odour research and consultancy for environmental odours with the following expertise:

Sampling of odorous air pollutants, including odours and some specific odorous compounds like ammonia, hydrogen sulfide, and volatile organic compounds (VOCs) from various odour sources using contemporary sampling equipment such as flux chamber, wind tunnel and stack sampler.

Measurement and monitoring of odour concentration and intensity using a dynamic olfactometer according to the European Standard Method (EN13725).

Dispersion modelling and impact assessment of odours for existing and proposed projects against required regulatory odour performance criteria.



Major Equipment List

- TO-Evolution Olfactometer
- Electronic Nose
- Odour Sampling Systems
- Floating Wind Tunnel Sampler
- Data Loggers
- Anemometers
- Multi-gas Monitors
- Air Samplers
- Weather Station
- Fluorescence H₂S Analyzer
- Flux Hood Sampler
- Photoacoustic Field Gas Monitors



Main Equipment



Geotech BioGas 5000 Portable Biogas Analyzer

Easy to use, calibrate and configure, the BIOGAS 5000 enables you to collect consistent data for improved analysis and accurate reporting, whilst helping to check the digester process efficiently. This unit provides you with a port to measure CH₄, CO₂ and O₂ plus extras including H₂, NH₃, H₂S gases.



Cyranose® 320 E-nose

The Electronic Nose configures 32 individual thin-film carbon-black polymer composite sensors, measuring the voltage change across each sensor and converting it into a resistance reading. When a mixture of complex gaseous chemicals is introduced to the Electronic Nose, the system will respond with a pattern showing the compositional characteristic of this mixture. This pattern can be used to distinguish gas mixtures for decision-making.

Main Equipment



**Jerome 631-X Gold Film
Hydrogen Sulfide Analyzer**

The portable Jerome 631-X Hydrogen Sulfide Analyzer measures low-level concentrations in just seconds. It offers an analysis range of 0.003-50 ppm for odour and corrosion control, safety, and leak detection in such industries as wastewater treatment, oil and gas, pulp and paper, and farming.



Nasal Ranger Field Olfactometer

The Nasal Ranger Field Olfactometer is the “state-of-the-art” in field olfactometry for confidently measuring and quantifying odor strength in the ambient air. It is a portable odour detecting and measuring device, determines ambient odour “Dilution-to-Threshold” (D/T) values objectively. The Field Olfactometer can be used as a proactive monitoring or enforcement tool for confident odour measurement, which provides a scientific method for dependable ambient odour quantification.

Main Equipment



CSD30 Odour Sampler

The CSD30 odour sampler is capable for conduct odour sampling using the lung principle, that is the sample flows into the gas sampling bag through the sampling tube only without passing through pumps or other equipment. By integrating a calibrated nozzle and a vacuum pump controlled by pressure difference, the CSD30 sampler is capable to conduct fixed-duration sampling (optional for 5-min, 10-min, 15-min, and 30-min). Our customized CSD30 sampler is capable for collecting 60 L of gas sample which is sufficient for olfactometry analysis.



TO Evolution Olfactometer

The TO evolution is the first ergonomically designed olfactometer which focuses on the main sensor in olfactometry: the human nose. The result is an olfactometer which, through the selection of materials and colours, offers the panellists a distraction-free environment. The modern and contemporary design of the software allows for intuitive and easy operation. TO evolution ensure that you can achieve best working conditions as described in the requirements of EN 13725:2003.

Academic Staff



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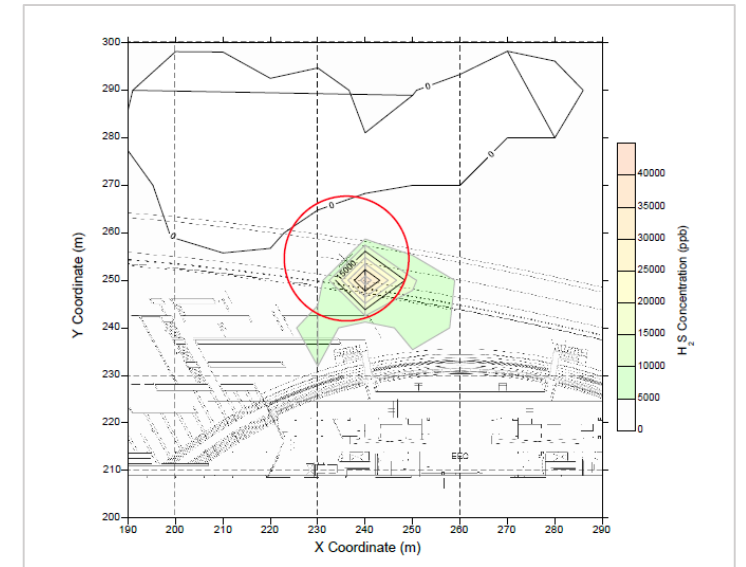
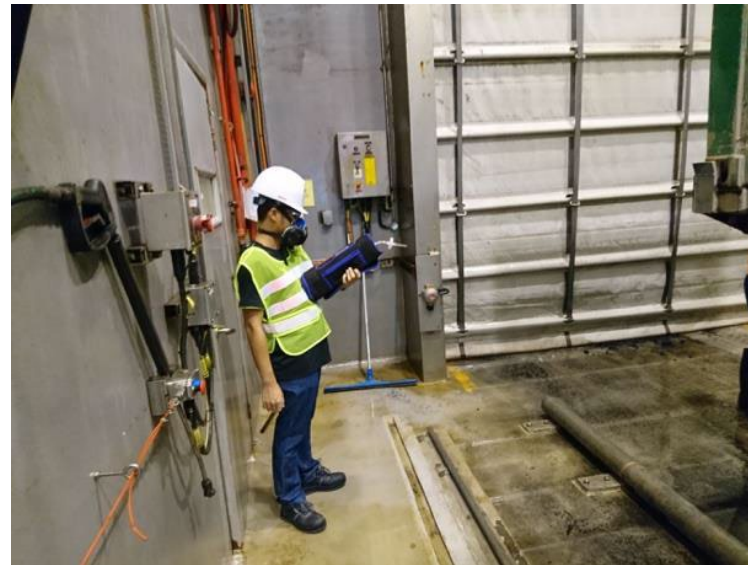
Research Fields

Odour Sampling	<p>Odour gaseous sample is collected by using an odour sampling system, which includes a battery-operated air pump, a sampling vessel, and an odour bag. During air sampling, an empty sample bag is placed in the vessel, a rigid plastic container, and the container is then evacuated at a controlled rate and the bag is filled with foul gas.</p>
Odour Patrol	<p>Exercise as a screening survey to identify the odour sources, odour strength, and also odour characters. Odour panel members need to be selected by a set of screening tests using certified n-butanol gas with standard individual n-butanol thresholds required by the European Standard Method (EN13725).</p>
Olfactometric Analysis	<p>The TO-evolution is a state-of-the-art olfactometer designed to perform one-out-of-two forced choice odour threshold measurements. One measurement, using a panel of 4 to 8 persons, can be completed in less than an hour. The odour research laboratory follows the European Standard Method EN13725 on odour measurements.</p>

Project Spotlight

Provision of Services for Monitoring of Hydrogen Sulfide (H₂S) Emission of Sewage Sludge and Risk Assessment due to Sludge Delivery and Unloading at the Sludge Treatment Facility
(*Environmental Protection Department, HKSAR, 2016*)

Odour lab was invited to carry out on-site H₂S measurements at the STF and model simulation of H₂S dispersion for specific sludge spillage cases. The acquired information will be used for risk assessment and establishing emergency response strategies.

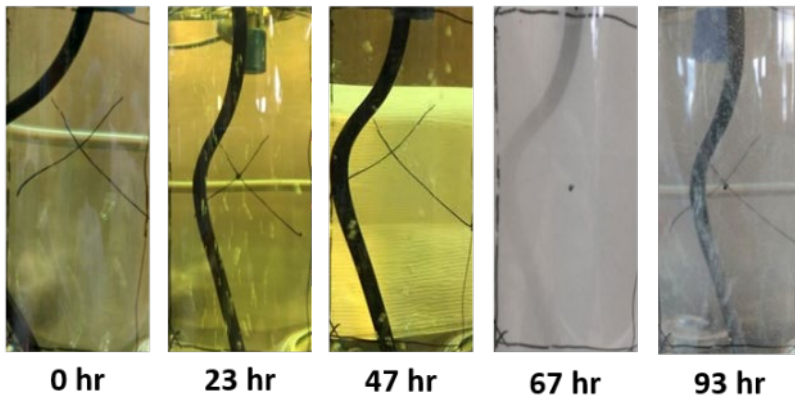


Project Spotlight

Contract No. ST1/LS/10/2018-Real-Time Aeration Measurements to Improve Energy Efficiency in Activated Sludge Processes in Hong Kong (*Drainage Services Department, HKSAR, 2018-2020*)

The off-gas equipment established in the water lab can be used to measure the energy consumption of wastewater aeration systems, providing information on the possible diffuser maintenance schedule and/or process optimization. This project provided the first set of real-time aeration monitoring instruments and experiment protocol to the DSD, which have never been applied in Hong Kong previously.

H₂S removal through micro-aeration



Project Spotlight

Odour Impact Assessment for HyD Contract No. HY/2014/07 – Central Kowloon Route – Kai Tak West (AECOM Asia Co. Ltd., 2018-2021)

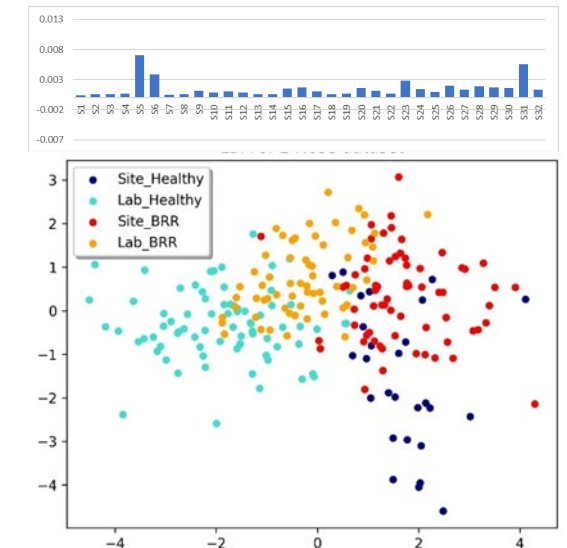
The Odour Research Laboratory was invited to carry out baseline odour patrol, odour and H₂S sampling and analysis, VOCs sampling analysis, impact odour patrol, and H₂S measurements for the captioned development project throughout the project lifecycle, in order to ensure the environmental quality for the surrounding areas during the development works.



Project Spotlight

Contract No. Hy(S)Q/056/2020 - Development of E-nose-based Detection Technique for Brown Root Rot Disease Infected Trees (*Highways Department, HKSAR, 2020*)

The Odour Research Laboratory was invited to carry out a service of development and evaluation of E-nose-based fast detection technique for Brown Root Rot disease infected trees. This project provided a fast and non-destructive diagnosis method to detect the infected tree, early action can be carried out to minimize the spread of disease and the risk to public safety.



Project Spotlight

Contract No. SPW 16/2020 – Upgrading of Tai Po Sewage Treatment Works – Investigation – Odour Survey and Analysis (*Drainage Services Department, HKSAR, 2020*)

The Odour Research Laboratory was invited to carry out odour sampling, testing, measurements and analysis works, and establish the odour emission rates / strengths for the existing TPSTW as well as the baseline odour conditions at the TPSTW site boundary and the nearby areas, in order to support the environmental impact assessment study for the captioned proposed project.



Project Spotlight

Contract No. NDO 07/2021 Odour Sampling Survey for Livestock Farms for the San Tin/ Lok Ma Chau Development Node (*Civil Engineering and Development Department, HKSAR, 2021*)

The Odour Research Laboratory was invited to carry out odour sampling, testing, measurements and analysis works, and establish the odour emission rates / strengths for 3 local farms (including pigs and chickens farm). The collected odour emission data will be used for the assessment of odour situation in and around the farms and further advice for improvement.



Project Spotlight

Selected Projects under Odour Research Laboratory (2012-2021)

Project for Sewage/Sludge Treatment Facilities	Client
Upgrading of Tai Po Sewage Treatment Work - Investigation – Odour Survey and Analysis	Drainage Services Department
Provision of Services for Monitoring of Hydrogen Sulfide (H ₂ S) Emission of Sewage Sludge and Risk Assessment due to Sludge Delivery and Unloading at the Sludge Treatment Facility	Environmental Protection Department
Provision of Services to Measure and Evaluate the Odour Emission Rates of Dewatered Sludge	Drainage Services Department
Odour Survey on HATS Stonecutters Island Sewage Treatment Works	ATAL Engineering Limited
Odour Survey for Relocation of Sha Tin Sewage Treatment Works to Caverns – Feasibility Study	Drainage Services Department
Projects at Sea/Nullah	Client
Odour Survey for Revitalization of Tsui Ping River	Drainage Services Department
On-site Sampling at Seawater Surface and Olfactometry Measurement at the Odour Laboratory at the Hong Kong Polytechnic University	Cinotech Consultants Limited

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Expert Review of New Yau Mei Tei Typhoon Shelter (NYMTTS) Odour Source Measurement	Mott MacDonald Hong Kong Limited
Project for Industries/Private Sectors/Construction Sites	Client
Odour Sampling Survey for Livestock Farms for the San Tin/ Lok Ma Chau Development Node	Civil Engineering and Development Department
Development of E-nose-based Detection Technique for Brown Root Rot Disease Infected Trees	Highways Department
Provision of Odour Emission Measurement at Leisure Garden in Diamond Hill	Cinotech Consultants Limited
Provision of Air Sampling and Analysis at the Asphalt Batching Plant	Hong Kong Asphalt (Green) Limited
Odour Impact Assessment: Central Kowloon Route, Kai Tak West	AECOM Asia Co. Ltd.
Odour Sampling at Tseung Kwan O Area 85	Environ Hong Kong Limited
Project for Solid Waste Treatment Facilities	Client
Odour Patrol Monitoring at West Kowloon Refuse Transfer Station	South China Transfer Limited
Odour Patrol at SENT Landfill Site	Green Valley Landfill Hong Kong Limited

Lab-in-charge and Technical Staff

Lab-in-Charge



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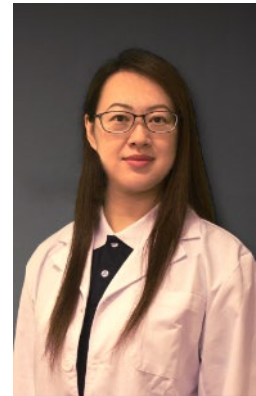
Opening Hours

Monday 8:45am – 12:30pm, 1:30pm – 5:45pm

Tuesday to Friday 8:45am – 12:30pm, 1:30pm – 5:30pm

(excluding Saturday, Sunday & public holidays)

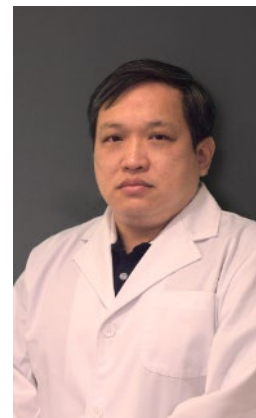
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