

## **Graphical Summary of Jerome Measurements for Quarter Three 2022.**

### **Introduction.**

This report covers the period:

- Quarter 3 – July, August and September 2022
- And an additional deployment made in June 2022 which was not reported within the previous report

Each graph shows concentration (ppb) plotted against time.

The Jeromes were deployed at selected properties, where they were left to continuously monitor ambient concentrations of hydrogen sulphide, taking a measurement every 15 minutes. Additionally, in order to obtain an assessment of any impacts that occur between samples, occupants of the deployment location are asked to activate the monitoring instrument manually whenever they are experiencing a health effect related to the emissions from the landfill or where they observe an odour. The occupier is also asked to keep a log of odour events and health effects.

The instruments were deployed at properties where there was a recent history of regular complaints, or which would be downwind of Walleys Quarry during the deployment period, or were in close proximity of the site. Reporting Period – equipment updates

- The two analysers have been subject to performance checks, service and calibration in accordance with manufacturers' instructions.
- A suitable weather proof enclosure has been purchased to enable the monitors to also be located externally for monitoring over a period of time.
- The analyser is set to monitor and record ambient concentrations of hydrogen sulphide every 15 minutes instead of 10 minutes following advice from the manufacturer

### **Assessment Criteria**

With regards to health impacts, there is no statutory limit which relates to environmental exposure to hydrogen sulphide. However, the World Health Organisation has produced an air quality guideline for the avoidance of annoyance at  $7 \mu\text{g}/\text{m}^3$  averaged over 30mins, which approximates to 5 parts per billion (ppb) averaged over 30 minutes. This is equates to a distinct odour (perceived intensity score of 3) and is the threshold of recognition of hydrogen sulphide (i.e. the concentration at which 50% of the population would recognise the odour as H<sub>2</sub>S).

The World Health Organisation has also produced an air quality guideline for the protection of health -  $150 \mu\text{g}/\text{m}^3$  averaged over 24 hours, which equates to 100ppb averaged over 24 hours. This is 100<sup>th</sup> of the concentration identified as resulting in the onset of health impacts, namely eye irritation, which begin to occur at 10 ppm (i.e. 10,000 ppb).

As described within the DEFRA publication `Odour Guidance for Local Authorities March 2010`, the characteristics of an odour affects the impact. Fairly regular exposure to some strong odours, even for short periods, can be both objectionable and offensive, such as in the case of hydrogen sulphide. Also, the concentration at which these odours become a statutory nuisance could be relatively low if they are persistent and frequent.

With regards to odour, by applying the Weber-Fechner Law, the perceived odour intensity (scored from 0 to 6) for hydrogen sulphide can be estimated from the measured concentration as described within the table below:

Odour Strength	Perceived Intensity	Approximate Concentration ( $\mu\text{g}/\text{m}^3$ )	Approximate Concentration (ppb)
Extremely strong	6	148	99
Very strong	5	57	38
Strong	4	22	14
Distinct	3	7	5
Weak/faint	2	3	2
Very weak/very faint	1	0.7	0.5
Not perceptible/no odour	0	0	0

**Note:** The exact conversion between ppm and  $\mu\text{g}/\text{m}^3$  is proportional to temperature and atmospheric pressure.

The limit of detection of the Jerome J605 is 3ppb. Any measurement below this value would be reported as 0. This does not necessarily mean that odour or gases associated with the landfill were absent, it can only be said that hydrogen sulphide concentration was below 3ppb at the time of measurement.

**Deployments to Properties.**

A graphical representation of each deployment of the instruments is given below.















