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UK Health Security Agency: public health risk assessment of the Environment Agency (EA) *Study of Ambient Air Quality at Lower Compton* from 15 October 2025 to 16 April 2026, published in June 2026 version AAM/TR/2026/05

Site history

1. Lower Compton Landfill site, Calne, is an active landfill site operated by Hills Waste Solutions Ltd, which accepts non-hazardous waste. In April 2025 the Environment Agency (EA) notified UKHSA of odour complaints received by the EA and Wiltshire Council, associated with landfill gas from the Lower Compton Landfill site.

The EA Study of Ambient Air Quality at Lower Compton. 15 October 2025 – 16 April 2026 (184 days)

2. The EA's Ambient Air Monitoring Team commenced a study of ambient air quality in the vicinity of Lower Compton Landfill Site in Calne, which began on 15 October 2025 in response to increased community concerns of odours. A mobile monitoring facility (MMF) containing equipment capable of measuring concentrations of hydrogen sulphide (H₂S), methane (CH₄) and particulate matter (TSP, PM₁₀ and PM_{2.5}) was set up in October 2025 at Priestley Primary School, approx. 450 m west of the landfill site boundary. Wind speed, wind direction, temperature and pressure measurements were also collected.



Figure 1: Map of Mobile Monitoring Facility (MMF) (blue star) in relation to the Lower Compton landfill site in yellow, Sands Farm landfill site in blue, Hills Materials Recovery Facility (MRF) in red and Sewage Treatment Works in pink.

Public Health Risk assessment

3. This Public Health Risk Assessment (PHRA) considers data collected between the 15 October 2025 and 16 April 2026 (184 days), with monitoring continuing after this date. Because the monitoring has not been completed, the data used for this PHRA is provisional and maybe subject to minor alterations following final checks by the EA. This PHRA is based on the results provided by the EA for the mobile monitoring facility location and therefore might not represent the levels of pollutants experienced in all locations – some might be higher for example at residents closer to the source of emissions.

Air quality standards and health-based guidance values

4. The data provided to UKHSA by the EA in their Study of Ambient Air Quality at Lower Compton published in June 2026 have been compared to appropriate standards or health-based guidance values.

Hydrogen sulphide

5. Airborne H₂S concentrations were measured, between 15 October 2025 and 16 April 2026, with successful data collection achieved for 96% of the monitoring period. Data loss has been reported to be due to routine fortnightly precision checks, quality control and analyser maintenance interventions.

Health-based guidance values

6. The health-based guidance values used by UKHSA for the PHRA for acute, and lifetime exposure to H₂S are summarised in the below tables.

WHO air quality guidelines*	US EPA RfC**
Assessment of odour impacts 7 µg/m ³ (0.005 ppm) (30-minute average)	Assessment of lifetime exposure 2 µg/m ³ (0.001 ppm)
Assessment of daily exposure 150 µg/m ³ (0.107 ppm) (24-hour average)	

*The WHO guideline value of 7 µg/m³ (5 ppb) over a 30-minute averaging period is a short-term odour value protective of odour annoyance

** Reference Concentration - an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime

US Environmental Protection Agency Acute exposure guideline levels (AEGLs)					
	Concentration ($\mu\text{g}/\text{m}^3$, ppm in brackets)				
	10 minutes	30 minutes	60 minutes	4 hours	8 hours
AEGL-1 [note 1]	1045 (0.75)	836 (0.60)	711 (0.51)	502 (0.36)	460 (0.33)
AEGL-2 [note 2]	57,150 (41)	44,600 (32)	37,660 (27)	27,880 (20)	23,700 (17)
AEGL-3 [note 3]	105,900 (76)	82,240 (59)	69,690 (50)	51,570 (37)	43,210 (31)

Note 1: Level of the chemical in air at or above which the general population could experience notable discomfort.

Note 2: Level of the chemical in air at or above which there may be irreversible or other serious long-lasting effects or impaired ability to escape.

Note 3: Level of the chemical in air at or above which the general population could experience life-threatening health effects or death.

Acute (short-term) exposure to hydrogen sulphide

Assessment of odour impacts – 30 minute average concentrations

7. The EA monitoring data were used to identify the percentage of time across the monitoring period when H_2S concentrations were above the WHO odour annoyance guideline level for H_2S ($7 \mu\text{g}/\text{m}^3$, 30-minute average).
8. H_2S concentrations were above WHO guideline value for odour annoyance for 1.3% of the monitoring period (not considering the period of incomplete data). H_2S concentrations were above the odour annoyance guideline value for a considerable percentage of the time in March (4.9%) and April (3.1%) 2026.
9. There were 106 occasions during the monitoring period where the 30-minute average concentration exceeded the WHO odour annoyance guideline level of $7 \mu\text{g}/\text{m}^3$ (not considering the period of incomplete data).
10. Monitoring data showed intermittent exceedances of the WHO odour annoyance guideline level ($7 \mu\text{g}/\text{m}^3$) during December 2025, January 2026, February 2026, March 2026 and April 2026. The highest frequency of exceedances occurred in March 2026, indicating a greater potential for odour complaints during this period.
11. Results indicate H_2S concentrations are elevated at lower wind speeds, when there is less dispersion or mixing of air.
12. Directional analysis shows the highest concentrations of H_2S came from the direction of Lower Compton landfill site.

13. The data indicates that the mobile monitoring facility location was affected by both intermittent and relatively continuous sources of H₂S from Lower Compton landfill site.

Public Health Risk Assessment of short-term peak exposures and health

14. The maximum recorded 30-minute average was 69.3 µg/m³ (not considering the period of incomplete data), which is below the US Environmental Protection Agency (US EPA) Acute Exposure Guideline Level (AEGL) AEGL-1 at 30 minutes.
15. All recorded maximum concentrations (not considering the period of incomplete data) remained below the AEGL-1 for all averaging periods.
16. When exposures are above the WHO odour annoyance guideline level for H₂S, there is potential for a significant amount of odour complaints. Odours can become a nuisance and start to affect people, causing temporary symptoms including headache, nausea, dizziness, watery eyes, stuffy nose, irritated throat, cough, particularly if a person has a pre-existing respiratory condition, sleep problems and stress. Individuals will react differently to the odour of H₂S. Some people may be more sensitive to H₂S odour than others.
17. The more exposure time spent above the guideline, the greater the likelihood of symptoms being experienced and impacting on people's health and wellbeing. Symptoms should subside once elevated levels of H₂S diminish. Symptoms may persist if there is regular exposure to H₂S concentrations above the odour annoyance guideline value, as a result of repeated odour annoyance, but would not be expected to continue long-term once the exposure has reduced to acceptable levels.
18. When H₂S concentrations are below the WHO odour annoyance guideline value, odour may still be present, however as concentrations fall to lower levels it is anticipated that the strength of any odour should also reduce.

Public Health Risk Assessment of daily exposure – 24 hour average concentrations

19. UKHSA has used the WHO 24-hour air quality guideline value of 150 µg/m³ to assess daily average exposure to H₂S. This value is protective of eye irritation.
20. The highest recorded 24-hour average was 15.7 µg/m³, (not considering the period of incomplete data).
21. The 24-hour average concentrations were below the WHO 24-hour average guideline value of 150 µg/m³ for the whole monitoring period (not considering the period of incomplete data).

Long-term/lifetime exposure

22. UKHSA reviewed the available health-based guidance values and consider the US EPA RfC of 2 µg/m³, to be the most appropriate value to use for the assessment of long-term exposure to H₂S. The RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. Exposure to concentrations of H₂S above the US EPA RfC does not necessarily mean health effects will occur, but it reduces the margin of safety that is considered desirable to protect health.
23. The average concentration of H₂S over the monitoring period was 1.8 µg/m³ (not considering the period of incomplete data), which is below the US EPA RfC.
24. The results do not indicate an exceedance of the long term toxicological health-based guidance value.

Particulate Matter

25. Levels of particulate matter have also been provided and a public health risk assessment carried out using the available guideline values presented below.

Particulate Matter (PM) UK Air Quality Standards

Substance	Concentration measured as	UK limit values
PM ₁₀	24 hour mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual mean	40 µg/m ³
PM _{2.5}	Annual mean	20 µg/m ³

Particulate Matter results and public health risk assessment

PM₁₀

26. The mean concentration over the monitoring period was 10.1 µg/m³.
27. The maximum 24-hour (midnight-midnight) average concentration was 29 µg/m³.

PM_{2.5}

28. The mean concentration over the monitoring period was 6.2 µg/m³.
29. The particulate matter results are all below the relevant air quality standards.

Methane

30. Methane (CH_4) is generally considered to be an asphyxiant rather than a toxic gas. It is typically only a risk to health in high concentrations in enclosed spaces.

Methane results and public health risk assessment

31. The average methane concentration was 1.55 mg/m^3 .
32. The highest concentration was seen at lower wind speeds, where there is less dispersion or mixing of air.
33. The highest concentrations of methane came from the direction of Lower Compton landfill site, and suggests a relatively continuous sources of methane with highest concentrations seen in the early morning and in the late evening.
34. There are no ambient air quality standards to compare the results to. However, levels greater than 80% methane may cause asphyxia (1% methane is equivalent to $6,556 \text{ mg/m}^3$) and the Lower Explosive Limit is $32,781 \text{ mg/m}^3$.
35. Methane results are below these levels, therefore health effects should not be experienced.

Conclusions

36. Overall, the monitoring results for H_2S , particulate matter and methane do not indicate an exceedance of the relevant standards or health-based guidance values. Based on the currently available monitoring data, provided in the EA report (Study of Ambient Air Quality at Lower Compton, published in June 2026) there would be minimal risks to public health at these levels of exposure from a toxicological perspective. It is important to note that the monitoring results reflect conditions at an individual location, but spot measurements taken around the landfill have not found concentrations of H_2S that would alter this conclusion.
37. However, there are periods where the H_2S concentration exceeds the WHO guideline value for odour annoyance. When exposures are above the WHO odour annoyance guideline level for H_2S , there is potential for a significant amount of odour complaints because odours can become a nuisance and start to affect people, causing temporary symptoms including headache, nausea, dizziness, watery eyes, stuffy nose, irritated throat, cough, particularly if a person has a pre-existing respiratory condition, sleep problems and stress. Individuals will react differently to the odour of H_2S . Some people may be more sensitive to H_2S odour than others. Symptoms may persist if there is regular exposure to H_2S concentrations above the odour annoyance

guideline value, as a result of repeated odour annoyance, but would not be expected to continue long-term once the exposure has reduced to acceptable levels.

38. People who have health conditions that affect breathing, such as asthma and chronic obstructive pulmonary disease (COPD), may experience increased frequency and/or severity of symptoms.

Recommendations

39. UKHSA strongly recommends that all appropriate measures are taken to reduce the off-site odours from the landfill site, to reduce the impacts experienced in the local community.
40. Residents should contact their GP regarding individual health concerns to enable provision of appropriate health advice and to enable the public health system to have a better understanding of the impact of the landfill on health.

References

World Health Organization (WHO) Air Quality Guidelines for Europe, 2nd Edition, Chapter 6, page 146 <https://iris.who.int/bitstream/handle/10665/107335/9789289013581-eng.pdf>

Hydrogen Sulphide Acute Exposure Guideline Levels (AEGLs) Acute Exposure Guideline Levels for Airborne Chemicals | US EPA <https://www.epa.gov/aegl/hydrogen-sulfide-results-aegl-program>

U.S. Environmental Protection Agency Reference Concentration for Hydrogen Sulphide. https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=61