

Health and Care Overview and Scrutiny Committee

Monday 26 July 2021

14:00

Castle House, Barracks Rd, Newcastle-under-Lyme, Newcastle ST5 1BL

NB. The meeting will be webcast live

<https://youtu.be/YZqO-zTw1WM>

John Tradewell
Director of Corporate Services
16 July 2021

A G E N D A

PART ONE

1. **Apologies**
2. **Declarations of Interest**
3. **Walley's Quarry Landfill Site - Health Implications** (Pages 1 - 22)

To consider matters relating to Walley's Quarry Landfill Site with a focus on health implications for residents.

The Committee will consider background papers, the current position, health implications and mitigation measures from representatives of Staffordshire Resilience Forum, Public Health England, Environment Agency and other Partners..

Reports:

- a) Walley's Quarry – Health Implications
- b) Environment Agency Briefing

4. **Background papers relating to Walley's Quarry**

Newcastle under Lyme Borough Council (NULBC) website:

1. Extraordinary Council 18 March 2021 and scrutiny review report : [here](#)
2. Cabinet Wednesday, 9 June 2021 Walley's Quarry update report [here](#) and decision taken [here](#)

5. **Exclusion of the Public**

The Chairman to move:-

That the public be excluded from the meeting for the following items of business which involve the likely disclosure of exempt information as defined in the paragraphs Part 1 of Schedule 12A Local Government Act 1972 (as amended) indicated below.

Membership	
Jak Abrahams	Jill Hood
Charlotte Atkins	Barbara Hughes
Philip Atkins, OBE	Thomas Jay
Martyn Buttery	David Leytham
Rosemary Claymore	Paul Northcott (Vice-Chairman (Overview))
Richard Cox	Jeremy Pert (Chairman)
Ann Edgeller (Vice-Chairman (Scrutiny))	Janice Silvester-Hall
Keith Flunder	Colin
Phil Hewitt	Ian Wilkes

Note for Members of the Press and Public

Filming of Meetings

The Open (public) section of this meeting may be filmed for live or later broadcasting or other use, and, if you are at the meeting, you may be filmed, and are deemed to have agreed to being filmed and to the use of the recording for broadcast and/or other purposes.

Recording by Press and Public

Recording (including by the use of social media) by the Press and Public is permitted from the public seating area provided it does not, in the opinion of the chairman, disrupt the meeting.

Scrutiny and Support Officer: Deb Breedon

Staffordshire Prepared



Report Title: Report to Health and Care Overview and Scrutiny Committee re: health & welfare impacts of Walleys Quarry

Date: 26 July 2021

1. Introduction

- 1.1. The following report has been produced at the request of the Health and Care Overview and Scrutiny Meeting focussing upon the health and wellbeing impacts of emissions from Walleys Quarry Landfill Site.
- 1.2. The contents are a consolidation of information from Staffordshire County Council (SCC), Newcastle-Under-Lyme Borough Council (NULBC), Public Health England (PHE) and the Strategic Coordinating Group (SCG) established for this incident. Please refer to the separate submission from the Environment Agency (EA) for information regarding the history of the site, its operation and the enforcement activity being undertaken.

2. The current position

- 2.1. For a number of years, parts of the borough have experienced problematic foul odours from the Walley’s Quarry Landfill Site in Silverdale. Until recently the site was operated by RED Industries Ltd, but in April the name of the operator has been changed to Walleys Quarry Ltd, albeit with many of the same company directors.
- 2.2. Over the weekend of the 26–28 February 2021 NULBC received over 2000 complaints from residents and organisations in the borough and further afield about the foul odours present in the area.
- 2.3. Problems with odours have continued since the February incident. The table below shows the level of complaints received by NULBC and by the EA in 2021.

Complaints To	January 2021	February 2021	March 2021	April 2021	May 2021	June 2021	Total Year to Date
NULBC*	921	3,263	4,799	3,316	3,466	1880	17,649
Environment Agency	2,050	4,098	6,347	6,181	8,482	4444	31, 602

*verification of complaints data has been undertaken since the last reported figures.

- 2.4. Multi-agency activity was initiated in March 2021 with an Incident Management Group (IMG) established initially to provide support to the coordination of organisational activity. The IMG was escalated to a Strategic Coordinating Group (SCG) in June 2021 due to the persistence of the odour and to provide a sustainable structure and route to any additional technical support and advice identified in the prolonged response.
- 2.5. The SCG's role is to ensure that a co-ordinated effort is achieved in responding to the situation and while it does not have collective authority to instruct agencies how to act, it provides an opportunity to agree coordinated direction which is translated by each responder.
- 2.6. The SCG has established four separate workstreams focussing on the multi-agency activity related to the site:
 - Communication & engagement cell led by SCC
 - Communities cell led by NULBC
 - Regulation & enforcement cell led by the EA
 - Scientific, technical advisory cell led by PHE
- 2.7. Walleys Quarry Ltd is reported to be complying with EA enforcement notices, but this has not had a marked effect on exposure and odour levels, based upon ratified air quality data. This understandably, means that many local residents remain unhappy and concerned and rightly expect that the situation is resolved as soon as possible.

3. Air quality monitoring

- 3.1 The EA has deployed air quality monitoring equipment in the Silverdale area and the results are being reviewed by PHE. PHE are continuing to provide a human health risk assessment of the data.
- 3.2 NULBC commissioned air quality consultancy Ricardo to undertake a review of the first two EA monitoring campaigns. Ricardo concluded that the EA monitoring campaigns focussed on assessing the landfill's potential impact on public health through its influence on local H₂S concentrations, and were useful in showing that the H₂S concentrations measured did not pose a direct health issue to local residents. However the monitoring did not provide a comprehensive view on the presence/absence of offensive odours, nor the potential psychosomatic effects of such odours.
- 3.3 The Ricardo report recommended that future monitoring should robustly address whether there was significant pollution which may:
 - Be harmful to human health or the quality of the environment
 - Cause offence to a human sense
 - Result in damage to a material property
 - Impair or interfere with amenities or other legitimate uses of the environment.

- 3.4 Subsequently, the EA, SCC, and NULBC have jointly funded an extension to the air quality monitoring, with four static units being in operation. The parameters monitored include Hydrogen sulphide (H₂S), Methane (CH₄), Oxides of nitrogen (NO_x, NO, NO₂), Particulate Matter (TSP, PM₁₀ and PM_{2.5}), Volatile Organic Compounds (VOCs) including Benzene, Toluene, Xylene and Ethylbenzene. In addition meteorological data will be collected. The data from these units is assessed by PHE against international guidelines published by World Health Organisation (WHO) and the US - Agency for Toxic Substances and Disease Registry (ATSDR) for annoyance and health impacts, with both the data and their assessments published. This information is summarised in the table below.
- 3.5 In addition to joining with the EA on the provision of static air quality monitors, NULBC has also deployed Jerome hand held air quality monitoring devices to be used both by Environmental Health Officers undertaking home visits, and to leave in properties for extended periods to monitor levels of H₂S.
- 3.6 These monitors have helped officers to develop a picture of H₂S concentrations and patterns of those concentrations over time as part of the effort to determine whether the odours give rise to a Statutory Nuisance, and whether an Abatement Notice should be served.
- 3.7 As this data was collected for purposes which may result in particular legal action, it has not yet been published on the Council's website. The data from the four static monitoring stations, however, is routinely published.
- 3.8 The air pollutant recorded at elevated levels so far has been hydrogen sulphide. Table 1 shows the frequency with which hydrogen sulphide concentrations have been above the World Health Organization's (WHO) odour annoyance guideline level (7 µg/m³, 30-minute average).

Table 1: frequency with which hydrogen sulphide concentrations have been above the WHO odour annoyance guideline

Location	19/4 – 25/4	26/4- 2/5	3//5 – 9/5	10/5- 16/5	17/5- 23/5	24/5 – 30/5	31/5 – 6/6	7/6 – 13/6	14/6 – 20/6	21/6 – 27/6	28/6 – 4/7	5/7- 11/7
MMF1 - Silverdale Cemetery	18%	4%	6%	15%	1%	7%	30%	1%	11%	2%	1%	5%
MMF2 - Silverdale Road	8%	10%	21%	20%	9%	15%	1%	10%	7%	1%	8%	18%
MMF6 - NuL Fire Station	4%	13%	6%	1%	10%	16%	6%	10%	9%	4%	8%	3%
MMF9 - Galingale View	21%	35%	48%	10%	53%	47%	18%	19%	13%	12%	10%	17%

- 3.9 The data provided to PHE by the EA have been compared to available health-based air quality guidelines and standards or assessment levels for hydrogen sulphide, particulate matter, nitrogen dioxide, and methane. Where the concentrations in air are shown to be lower than appropriate health based standards or guidelines, it may be assessed that the risk to long term health is minimal. The 24-hour average guideline value for hydrogen sulphide (150µg/m³) was exceeded at one monitoring station on two days during the monitoring period: 7 & 8 March 2021, the highest of which was 202 µg/m³.
- 3.10 Exposure to concentrations of hydrogen sulphide above the WHO 24-hour guideline value does not necessarily mean that health effects will occur, but it reduces the margin of safety that is considered desirable to protect health. The human nose is very sensitive to odours, and substances that are perceived as odorous are commonly present at levels below which there is a direct toxicological effect.

4. Health impacts

- 4.1 Based on the air quality monitoring data PHE's assessment is that any risk to long-term physical health is likely to be small. However, they stress that they cannot completely exclude a risk to health from pollutants in the area, especially if exposure continues at these levels. PHE's human health risk assessment along with further information can be found at the following link: <https://consult.environment-agency.gov.uk/west-midlands/walleys-quarry-landfill-sliverdale/>
- 4.2 PHE are becoming increasingly concerned about the potential for long term health effects because of the duration of exposure to air pollution that residents have already suffered and the uncertainty about how much longer this will persist.
- 4.3 The results for hydrogen sulphide continue to be above the WHO annoyance guideline value for a considerable percentage of the time, which is undesirable due to the effects on people's wellbeing and the symptoms they are experiencing.
- 4.4 Residents have reported a range of symptoms associated with the air pollution, with reports made to a survey by local MP Aaron Bell, 'impact statements' to NULBC, and a 'symptom tracker' established by SCC <https://www.staffordshire.gov.uk/Care-for-all-ages/Publichealth/Walleys-Quarry/Smell-and-symptom-tracker.aspx>.
- 4.5 The results of all of these are similar, with people reporting a range of symptoms such as headache, nausea, irritation to the eyes, exacerbation of underlying respiratory illness and mental health problems including anxiety and depression.
- 4.6 At Tuesday 13 July there had been a cumulative total of 1807 responses to the 'symptom tracker'. Reports of odour are shown in Table 1 and reports of symptoms in Table 2. PHE, SCC and the NHS are working with Keele University to conduct a study to try and more accurately quantify the impact of emissions of hydrogen sulphide on health.
- 4.7 The frequency and intensity of reported odour and symptoms is greater in the area closer to the site. In the map in Figure 1 below the 'inner zone' where reports of odour and symptoms are most common and intense has a population of around

11,000 and the 'outer zone' a population of 37,000 (26,000 in addition to the 'inner zone').

Table 1: Symptom tracker cumulative reports of odour (highest rating given for that day)

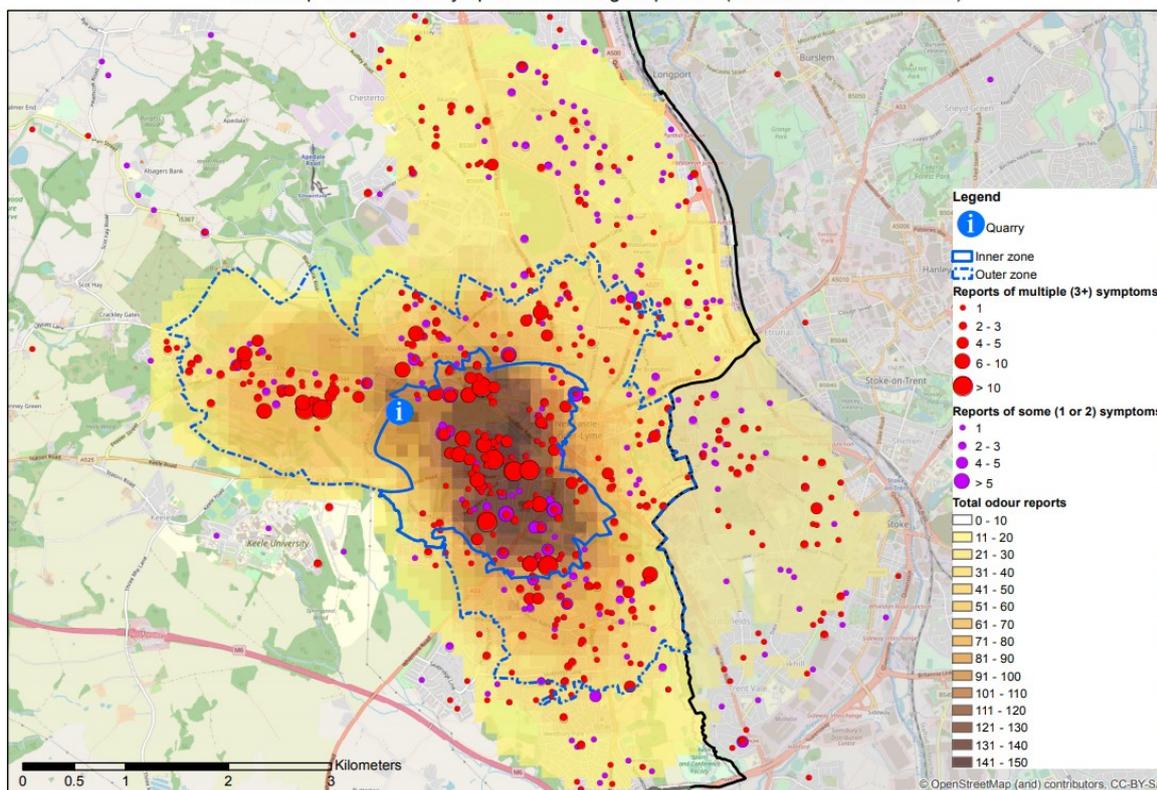
Odour level	Cumulative responses
6 - Extremely strong odour	629 (35%)
5 - Very strong odour	445 (25%)
4 - Strong odour	358 (20%)
3 - Distinct odour	213 (12%)
2 - Faint odour	68 (4%)
1 - Very faint odour	23 (1%)
0 - No odour	71 (4%)
Grand Total	1807 (100%)

Table 2: Symptom tracker cumulative reports of symptoms (irrespective of time of day)

Symptom	Cumulative responses
Feeling sick	949 (53%)
Headache	1199 (66%)
Dizziness	438 (24%)
Stinging eyes	805 (45%)
Difficulty breathing	553 (31%)
Disturbed sleep	1148 (64%)
Feeling anxious or depressed	774 (3%)

Figure 1: map showing location of reports of odour and symptoms

Heatmap of odour and symptom monitoring responses (cumulative to 24-06-2021)



5. Actions underway and planned to mitigate the risk to resident's health

- 5.1 The EA is responsible for regulating the landfill site and are working with the operator to carry out works to try and remediate the problem.
- 5.2 PHE, SCC and the NHS strongly recommends that all measures are taken to reduce the offsite odours from the landfill site. The rapid reduction in emissions of hydrogen sulphide from the site is fundamental to minimising any further harm to health.
- 5.3 The NHS has put in place extra capacity for people with mild or moderate mental health impacts such as anxiety, depression and sleep disorders.

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Health Risk Assessment of air quality monitoring results from March to May 2021: Walley's Quarry Landfill Site, Newcastle-under-Lyme

Regarding ongoing response to odours and health concerns associated with the site

Non-Technical Summary

The site is owned by Walley's Quarry Limited (formerly RED industries), who operate the site as an active landfill which accepts non-hazardous waste, and a cell which accepts stable non-reactive hazardous waste (gypsum and asbestos). Activities at the site are regulated by the Environment Agency (EA) under an Environmental Permit first issued in 2016.

In response to increased community concern of odours within Silverdale and the surrounding areas, the EA have recently installed four air quality Mobile Monitoring Facility (MMF) units which are to remain in place till at least August 2021 to collect monitoring data to continuously assess air quality.

It is important to make a distinction between concerns about odour and any toxicological effect from exposure to airborne chemicals. The aim of this risk assessment is to interpret the available data in relation to potential toxicological effects.

The data provided to Public Health England (PHE), by the Environment Agency (EA) have been compared to available health-based air quality guidelines and standards or assessment levels for hydrogen sulphide, particulate matter, nitrogen dioxide and methane. Where the concentrations in air are shown to be lower than appropriate health-based standards or guidelines, it may be assessed that the risk to health is minimal.

The 24-hour average guideline value for hydrogen sulphide was exceeded at MMF9 on two days during the monitoring period: 7 and 8 March 2021, the highest of which was 202 $\mu\text{g}/\text{m}^3$. Exposure to concentrations of hydrogen sulphide above the WHO 24-hour guideline value does not necessarily mean eye irritation or other health effects will occur, but it reduces the margin of safety that is considered desirable to protect health.

The current hydrogen sulphide data up to the end of May shows continuing exposure to the population around the site, although any risk to long-term physical health is likely to be small. However, we would stress that we cannot completely exclude a risk to health from pollutants in the area, especially if exposure continues at these levels. Short-term health effects may be experienced such as irritation to the eyes, nose and throat. People who have health conditions that affect breathing, such as asthma, may experience increased frequency and/or severity of symptoms.

It is important however, to note public concerns in relation to odours. The human nose is very sensitive to odours, and substances that are perceived as odorous are commonly present at levels below which there is a direct toxicological effect. Odours can cause nuisance amongst the population possibly leading to stress and anxiety. Some people may

experience symptoms such as nausea, headaches or dizziness, as a response to odours even when the substances that cause those smells are themselves not harmful to physical health.

Scope

The EA has recently shared with PHE, an Air Quality report based on monitoring data from MMF Stations MMF2 and MMF9 from which there is data from the 4 March – 31 May 2021 (89 days).

In April two additional monitors were deployed MMF1 from which there is data from the 14 April - 31 May 2021 and MMF 6 from which there is data from the 24 April – 31 May 2021.

PHE has reviewed the available data from the MMF stations, listed below:

MMF 1 Location – Silverdale cemetery

MMF 2 Location – Silverdale Road, Newcastle under Lyme

MMF 6 Location – Newcastle community Fire Station

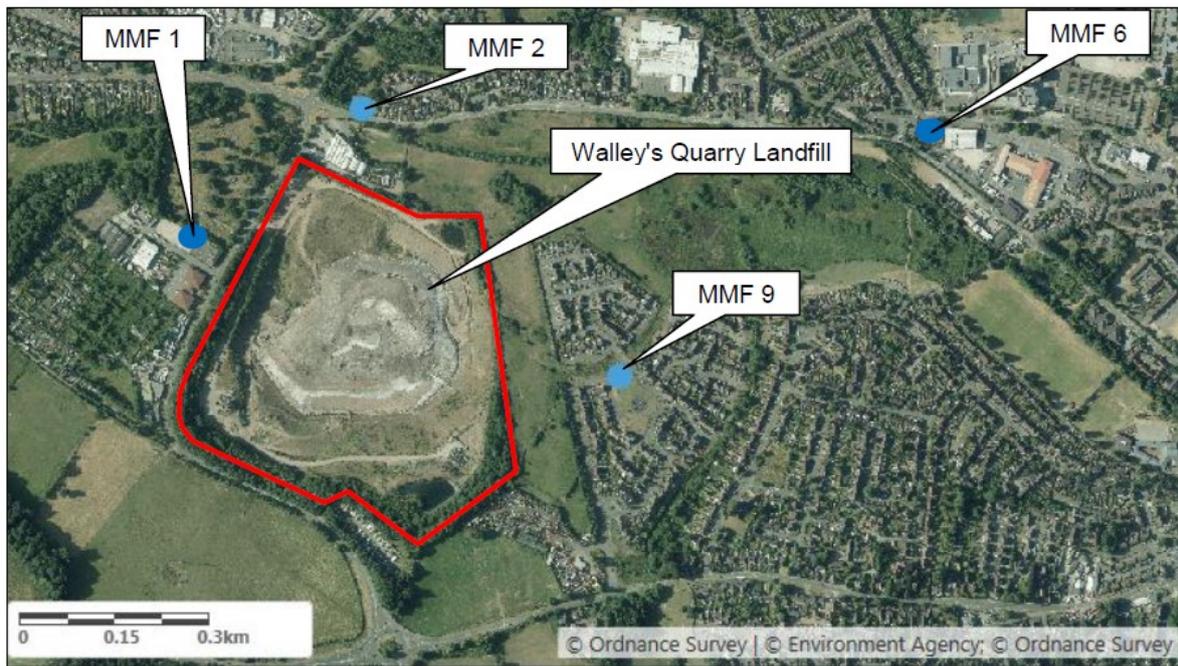
MMF9 Location - Severn Trent Pumping Station off Galingale View, Newcastle under Lyme

Table 1 Monitoring stations and the contaminants they are monitoring

Monitoring station	Hydrogen sulphide (H ₂ S)	Methane (CH ₄)	Nitrogen dioxide (NO ₂)	Particulate matter (PM ₁₀ , PM _{2.5}),	Benzene, toluene, ethylbenzene and xylene*
MMF1	✓	✓		✓	
MMF2	✓	✓	✓	✓	✓
MMF6	✓	✓		✓	
MMF9	✓	✓	✓	✓	✓

*The EA is also monitoring for benzene, toluene, ethylbenzene and xylene, however this data is not yet available for PHE to review.

Figure 1. Map showing the location of the four monitoring sites



Methodology

Air quality standards and assessment levels

The data provided to PHE have been compared to available health-based air quality guidelines and standards or assessment levels. There are a variety of health-based standards and assessment levels that have been derived by a number of organisations shown below:

- UK health-based guidance values
- UK air quality standards
- World Health Organization (WHO) air quality guidelines
- European air quality standards
- Other UK air quality assessment levels
- National air quality assessment levels (other than UK)

Air quality monitoring results and discussion

The health-based guidance values considered for the risk assessment for acute, intermediate and lifetime exposure are summarised in Table 2.

Table 2: Health based guidance values used for this risk assessment

WHO air quality guidelines	ATSDR- MRL**	US EPA RfC***	OEHHA Chronic REL****
30-minute (average)* 7 µg/m ³ (5 ppb)	Intermediate (up to 1 year): 30 µg/m ³ (20 ppb)	For assessment of lifetime exposure	For assessment of lifetime exposure
24-hour (average) 150 µg/m ³ (107 ppb)	Based on lesions of the nasal olfactory epithelium in rats.	2 µg/m ³ (1 ppb)	10 µg/m ³ (7 ppb)
Based on eye irritation in humans.		Based on lesions of the nasal olfactory epithelium in rats.	Based on lesions of the nasal olfactory epithelium in rats.

*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 annoyance¹.

** An MRL is an estimate of the daily human exposure to a hazardous substance that is likely to be without appreciable risk of adverse non-cancer health effects over a specified duration of exposure. They are derived for acute (>1, ≤14 days), intermediate (>14, <364 days), and chronic (365 days and longer) exposure durations².

*** 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 lifetime³.

**** The concentration level at or below which no adverse health effects are anticipated for a specified exposure duration is termed the reference exposure level (REL)⁴.

Hydrogen sulphide (H₂S) acute exposure

WHO 30-minute (average) guideline

The EA monitoring data were used to identify the percentage of time hydrogen sulphide concentrations were above the World Health Organization's odour annoyance guideline level (7 µg/m³, 30-minute average):

MMF1 (14/04/2021 to 31/05/2021): 10%

MMF2 (04/03/2021 to 31/05/2021): 14%

MMF6 (24/04/2021 to 31/05/2021): 7%

MMF9 (04/03/2021 to 31/05/2021): 36%

As such, there was potential for significant odour complaints to occur over these periods.

WHO 24-hour (average) guideline

The monitoring data has been converted to 24-hour averages for each of the monitoring days. At MMF1, MMF2 and MMF6 24-hour average values were significantly below the WHO 24-hour average guideline value of 150µg/m³⁵.

However, at MMF9, the 24-hour average guideline value was exceeded on two days during the monitoring period: 7 and 8 March 2021, the highest of which was 202 µg/m³.

Exposure to concentrations of hydrogen sulphide above the WHO 24-hour guideline value does not necessarily mean eye irritation or other health effects will occur, but it reduces the margin of safety that is considered desirable to protect health.

Peak exposures

Table 3 US Environmental Protection Agency (US EPA) Acute Exposure Guideline Levels (AEGLs) for hydrogen sulphide

	10 min	30 min	60 min	4 hour	8 hour
AEGL-1[†]					
ppb	750	600	510	360	330
µg/m ³	(1045)	(836)	(711)	(502)	(460)
AEGL-2^{††}					
ppb	41000	32000	27000	20000	17000
µg/m ³	(57150)	(44600)	(37660)	(27880)	(23700)
AEGL-3^{†††}					
ppb	76000	59000	50000	37000	31000
µg/m ³	(105900)	(82240)	(69690)	(51570)	(43210)

[†] The level of the chemical in air at or above which the general population could experience notable discomfort.

^{††} The 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.

^{†††} The level of the chemical in air at or above which the general population could experience life-threatening health effects or death⁶.

Short-term peaks in hydrogen sulphide concentration have been compared against the US Environmental Protection Agency (US EPA) Acute Exposure Guideline Levels (AEGLs) (see Table 3).

AEGLs are expressed as specific concentrations of airborne chemicals at which health effects may occur and used to assess peaks of exposure. They are designed to protect the elderly and children, and other individuals who may be susceptible.

The monitoring data from MMF1, MMF2, MMF6 and MMF9 were compared with AEGL-1 10-minute, 30-minute, 60-minute, 4-hour and 8-hour levels for hydrogen sulphide (Figures 1-4 in the Appendix). At MMF 9 AEGL-1 was exceeded across the AEGL time frames as set out in Table 1 in the Appendix.

Exposure to concentrations above the AEGL-1 values may cause notable discomfort, irritation or certain asymptomatic, non-sensory effects. However, the effects are not disabling, and are transient and reversible upon cessation of exposure.

Medium term exposure

To assess intermediate exposure to hydrogen sulphide during 2021, the calculated average of the daily exposure concentrations from the March - May data have been compared against the Agency for Toxic Substances and Disease Registry (ATSDR)

Intermediate Minimal Risk Level (MRL) of 30 µg/m³, which applies to up to 1 year.
The average daily hydrogen sulphide concentrations:

MMF1 (14/04/2021 to 31/05/2021): 2.6 µg/m³
MMF2 (04/03/2021 to 31/05/2021): 3.8 µg/m³
MMF6 (24/04/2021 to 31/05/2021): 3.3 µg/m³
MMF9 (04/03/2021 to 31/05/2021): 22.8 µg/m³

At all the monitoring stations the average daily hydrogen sulphide concentrations are below the ATSDR Intermediate MRL. As such, any risk to long-term physical health is likely to be small.

Assessment of previous monitoring data

To assess long-term exposure to hydrogen sulphide the previous monitoring data from the 6/7/2017 to 14/2/2018 and 15/1/2019 to 25/6/2019 monitoring periods has been compared against the US EPA Reference Concentration (RfC) and the California Office of Environmental Health Hazard Assessment (OEHHA) Chronic Reference Exposure Level (REL) to assess long-term exposure to hydrogen sulphide. For the 2017/18 monitoring period the average 24-hour concentration was 0.85 µg/m³ and for the 2019 the average 24-hour concentration was 0.95 µg/m³. These previous concentrations are below the US EPA and OEHHA values therefore they would not be expected to contribute to any significant effects on health.

Particulate matter UK air quality objectives

Table 4

Substance	UK limit values
PM ₁₀	50 µg/m ³ not to be exceeded more than 35 times a year 24 hour mean
	40 µg/m ³ Annual mean
PM _{2.5}	25 µg/m ³ Annual mean

PM₁₀:

Average for MMF1 (12/04/2021 to 31/05/2021): 21.8 µg/m³
Average for MMF2 (04/03/2021 to 31/05/2021): 17.4 µg/m³
Average for MMF6 (29/04/2021 to 31/05/2021): 10.8 µg/m³
Average for MMF9 (04/03/2021 to 31/05/2021): 12.7 µg/m³

PM_{2.5}:

Average for MMF1 (14/04/2021 to 31/05/2021): 9.8 µg/m³
Average for MMF2 (04/03/2021 to 31/05/2021): 9.4 µg/m³
Average for MMF6 (24/04/2021 to 31/05/2021): 7.5 µg/m³
Average for MMF9 (04/03/2021 to 31/05/2021): 8.3 µg/m³

These results are all below the relevant annual air quality objectives.

Nitrogen dioxide UK air quality objectives

Table 5

Substance	UK limit values
NO ₂	200 µg/m ³ not to be exceeded more than 18 times a year 24-hour mean
	40 µg/m ³ Annual mean

Average for MMF2 (04/03/2021 to 31/05/2021): 15.7 µg/m³

Average for MMF9 (04/03/2021 to 31/05/2021): 10.8 µg/m³

These results are all well below the relevant annual air quality objectives.

Methane (CH₄)

Methane 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. There are no ambient air quality standards. However, levels greater than 80% methane may cause asphyxia (1% methane is equivalent to 6,556 mg/m³) and the Lower Explosive Limit is 32,781 mg/m³.

The maximum concentration of methane recorded were:

MMF1 (14/04/2021 to 31/05/2021): 2.9 mg/m³

MMF2 (04/03/2021 to 31/05/2021): 3.0 mg/m³

MMF6 (24/04/2021 to 31/05/2021): 2.0 mg/m³

MMF9 (04/03/2021 to 31/05/2021): 5.1 mg/m³

All the maximum concentrations of methane were significantly below the values discussed above.

Benzene, toluene, ethylbenzene and xylene (BTEX)

The EA is monitoring for BTEX contaminants; however these data have not yet been made available to PHE.

Conclusions

The monitoring results for particulate matter and nitrogen dioxide were below UK air quality objectives. Therefore, there would be minimal risks to health at these levels of exposure.

The results for hydrogen sulphide continue to be above the WHO annoyance guideline value for a considerable percentage of the time, which is undesirable due to the effects on people's wellbeing and the symptoms they are experiencing.

Therefore, PHE strongly recommends that all measures are taken to reduce the off-site odours from the landfill site.

For the majority of the monitoring period from March to May 2021 the concentrations of hydrogen sulphide were below the WHO 24-hour health-based guideline value and AEGL values. The WHO 24-hour value and the AEGLs values were exceeded over a 2-day period on 7 and 8 March 2021. Exposure to concentrations above these values could potentially cause notable discomfort and irritation. Exceedances of these values does not necessarily mean health effects will occur, but it reduces the margin of safety that is generally considered to be desirable to protect health.

The current hydrogen sulphide data up to the end of May shows continuing exposure to the population around the site, above levels acceptable for long-term exposure. The ATSDR intermediate MRL for exposure between 14 - 364 days has not been exceeded. As a result, currently any risk to long-term physical health is likely to be small, however we would stress that we cannot completely exclude a risk to health from pollutants in the area, especially if exposure continues at these levels. Short-term health effects may be experienced such as irritation to the eyes, nose and throat. Individuals with pre-existing respiratory conditions may be more susceptible to these effects.

PHE understands that further air quality monitoring is being undertaken by the Environment Agency and this report will be updated as appropriate when more data is available. The Environment Agency and multi-agency partners will also be assessing additional factors such as meteorological conditions, complaints, and distance to receptors from the monitoring stations. PHE will continue supporting the other agencies with this work.

References

- 1 World Health Organization (WHO) air quality guideline [Microsoft Word - 6.6-hydrogen sulfide.doc \(who.int\)](#)
- 2 U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR), Toxicological profile for Hydrogen Sulphide, 2006. <http://www.atsdr.cdc.gov/ToxProfiles/tp114.pdf>
- 3 U.S. Environmental Protection Agency Reference Concentration for Hydrogen Sulphide. https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=61
- 4 California Office of Environmental Health Hazard Assessment Chronic Reference Exposure Level for Hydrogen Sulphide. <https://oehha.ca.gov/chemicals/hydrogen-sulfide>
- 6 Hydrogen Sulphide Acute Exposure Guideline Levels (AEGLs) [Acute Exposure Guideline Levels for Airborne Chemicals | US EPA](#)

Appendix

Figure 1

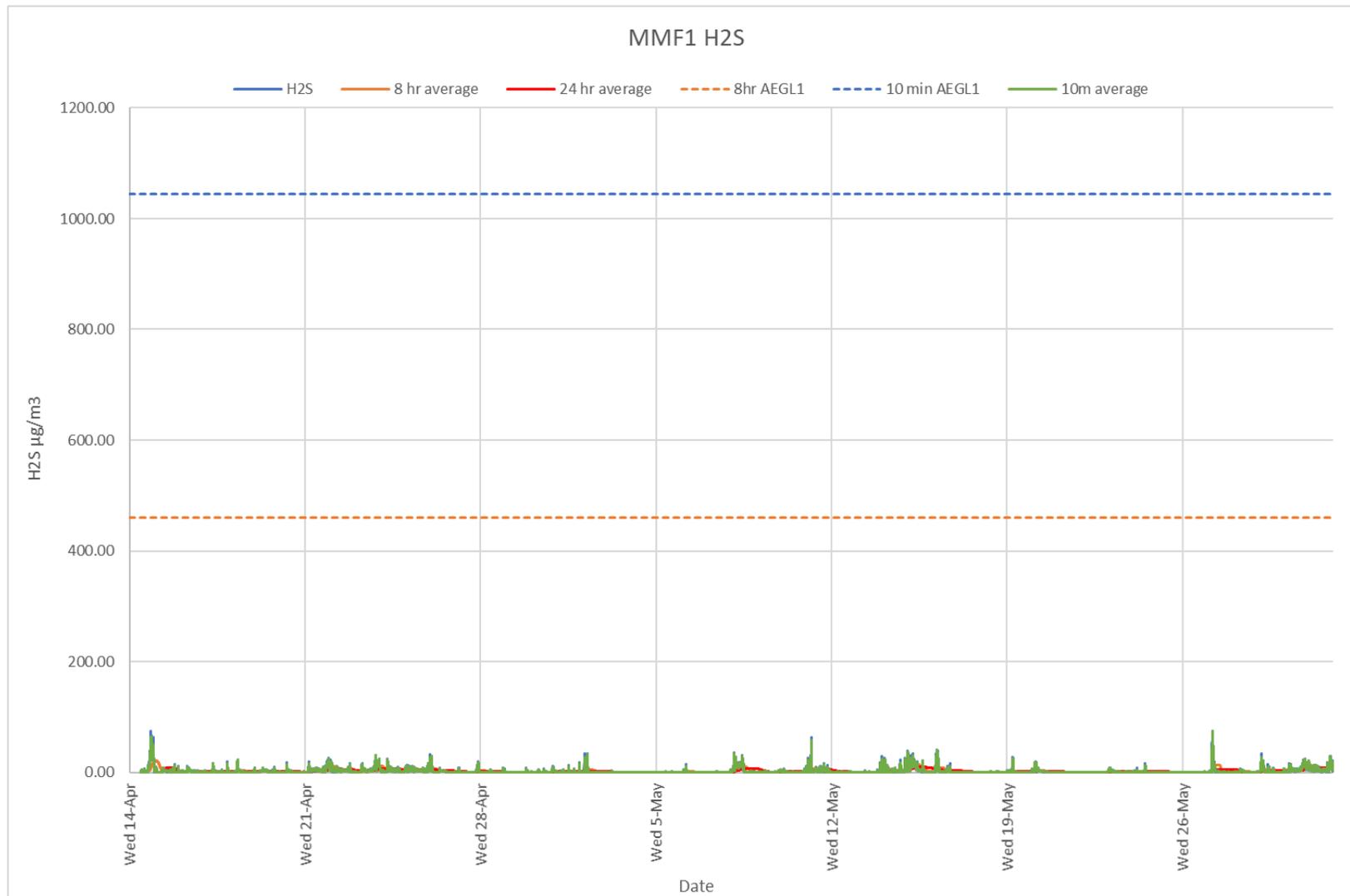


Figure 2

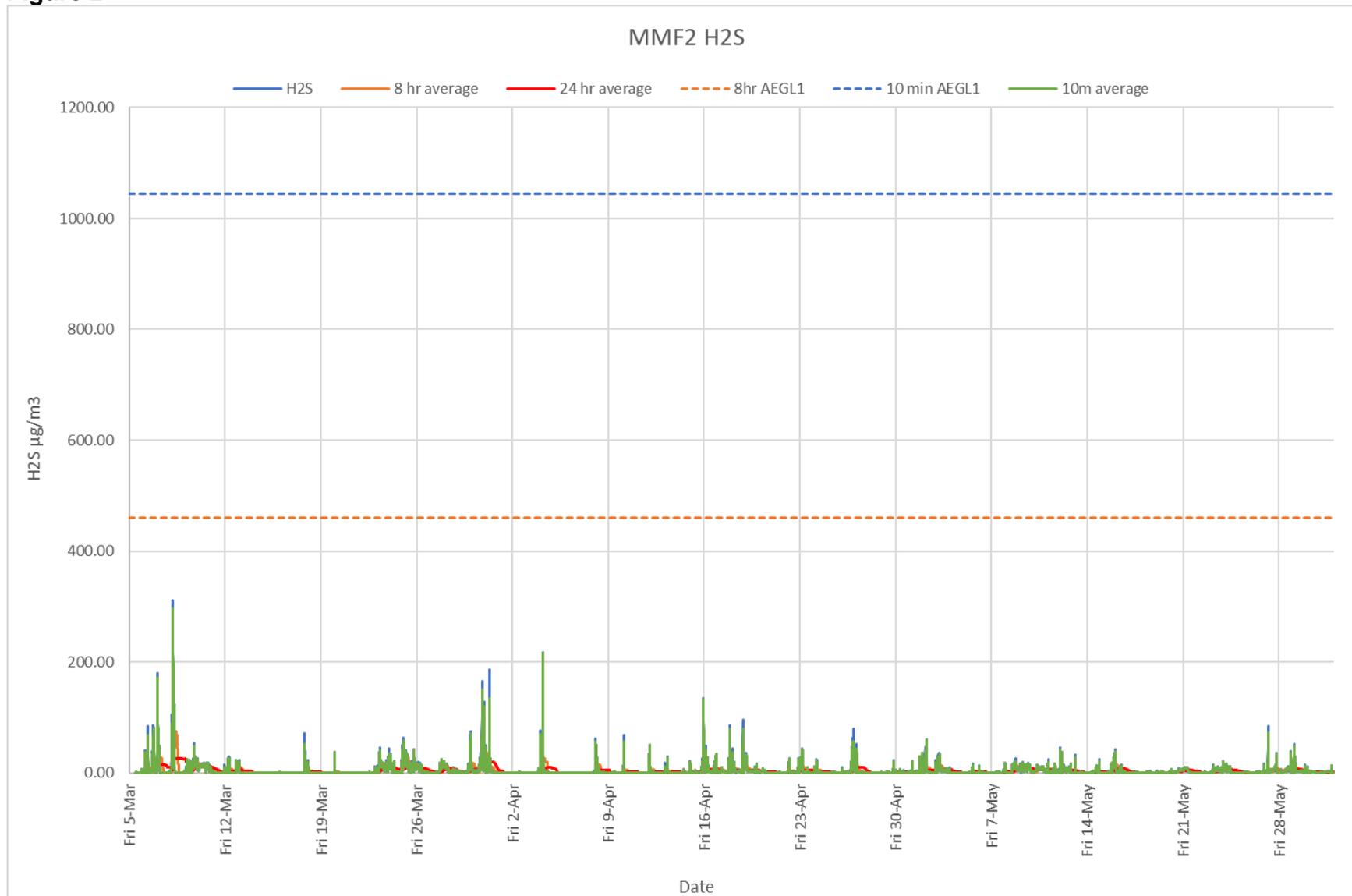


Figure 3

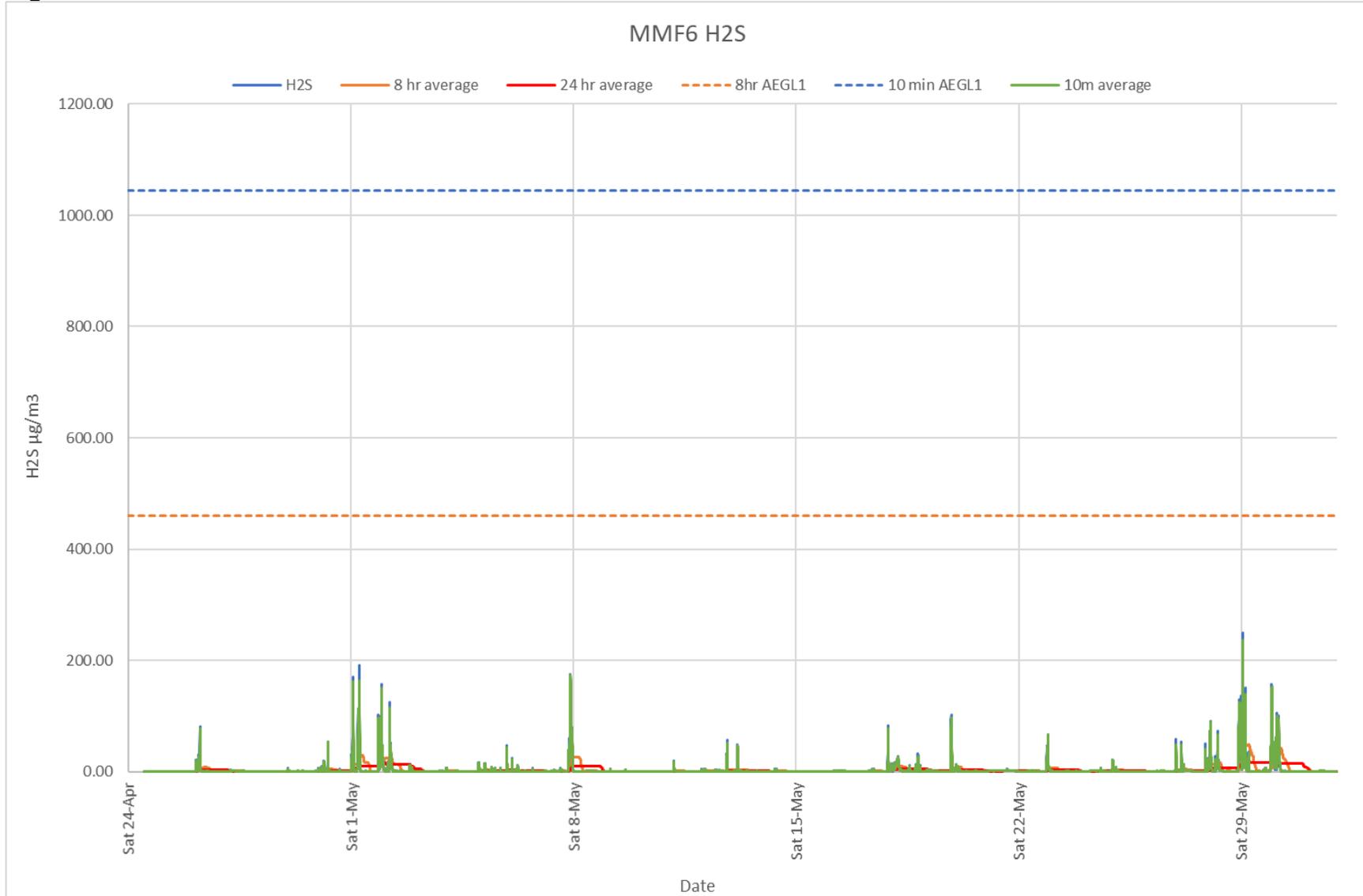


Figure 4

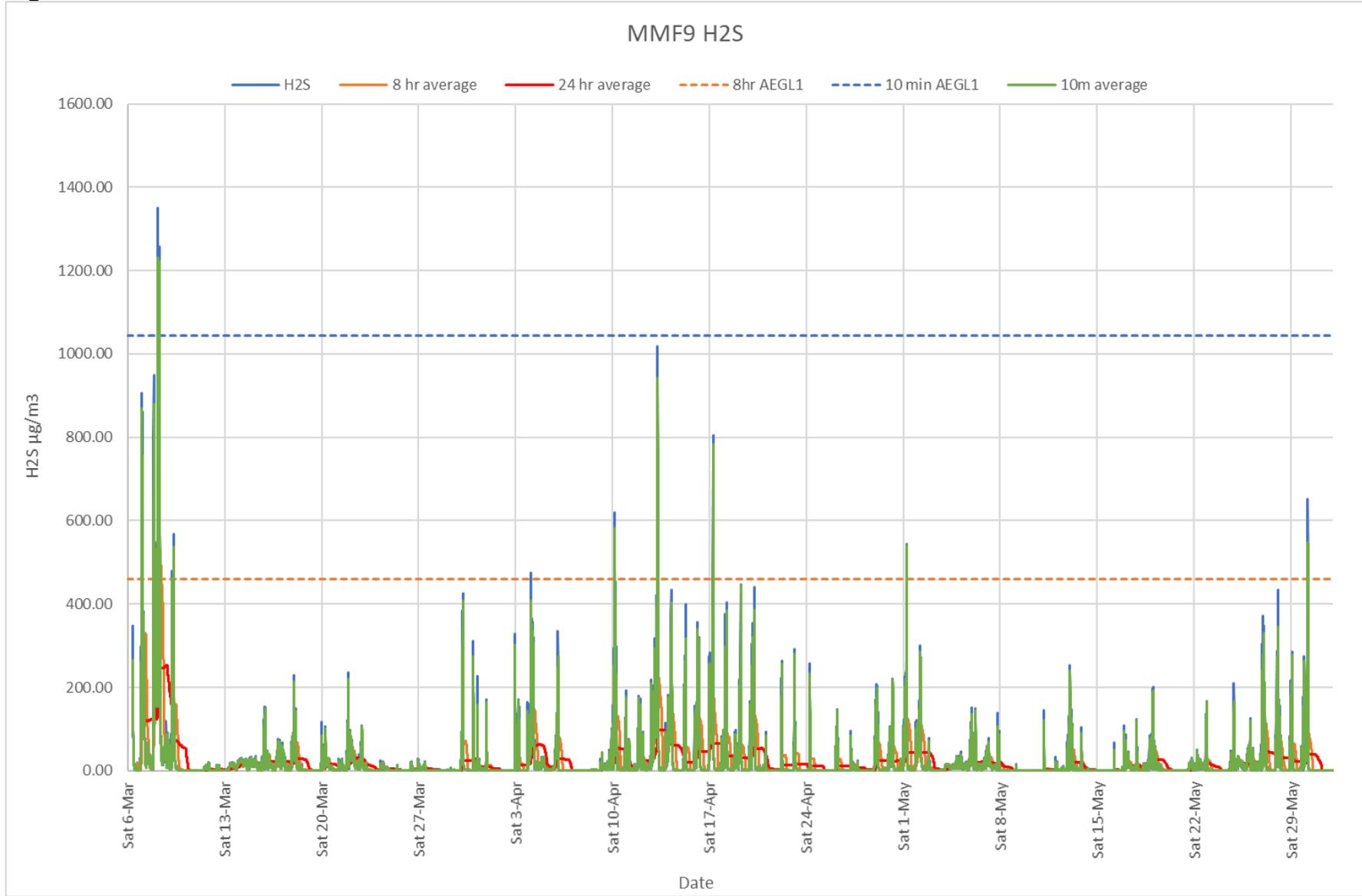


Table 1 AEGL time frames

	Acute Exposure Guideline Levels (AEGLs)				
	10 min	30 min	60 min	4 hour	8 hour
Timeframe of Exceedances at MMF9	0615 - 0650hrs (7 th March)	0550 - 0655hrs (7 th March)	0415 - 0650hrs (7 th March)	0210 - 0550hrs (7 th March)	2245hrs (7 th March) – 0230hrs (8 th March)

15 July 2021

Walleys Quarry Landfill Briefing for Staffordshire Health and Care Overview and Scrutiny Meeting - 26 July 2021

Our Role

The Environment Agency's primary role at Walleys Quarry is to regulate the two environmental permits held by the operator of the landfill, Walleys Quarry Ltd. The permits cover on-site activities, with the aim of minimising the impact on the local environment in terms of air quality, noise, odour, dust, leachate, and impacts to groundwater. We enforce that permit through monitoring and undertaking site visits (both announced and unannounced) and where needed we take enforcement action to address compliance issues.

At sites that we regulate, we have a statutory requirement to protect the environment and safeguard people's health. Our main objective at Walleys Quarry is to get the operator to return to a state of compliance with their permit, this includes them taking the necessary actions to reduce the odour levels on the site. Though landfill sites will never be completely free of odour, the levels experienced at Walleys Quarry Landfill are unacceptable and we are using all the regulatory powers and tools available to us to bring the site back into compliance.

Current situation as of 15 July 2021

We are continuing to see a high number of reports daily of odour complaints, along with reports of impacts of health. For the week 05 July to 11 July 2021 Hydrogen sulphide levels for these dates were below the World Health Organisation's (WHO) 24-hour average health guideline level to protect against short-term health effects but were above the WHO's 30-minute average odour annoyance guideline level between 3% and 18% of that week. Overall the concentrations are slowly reducing, but levels have now been persistently above the annoyance guidelines since early March.

We understand that local residents are concerned about the potential health-related issues that come from long term exposure to hydrogen sulphide or other landfill gases. It is important to stress that we are not health experts, and it would not be appropriate for us to advice or comment on health related matters.

We are sign-posting residents to resources and sources of information like a daily health survey held by Staffordshire County Council.

We recognise that the odour is incredibly distressing and is having a significant impact on residents. Health partners have expressed concerns about the mental health impacts of the situation as well as the risk to physical health as a result.

Our Mitigation Measures

We have held meetings with the operator to discuss gas management on the site, and have agreed an action plan to improve gas containment and collection to further reduce odour emissions from the site. This will see a further 22 gas collection wells drilled across the site over the coming months bringing the total to 77 gas wells.

We have installed four air quality Mobile Monitoring Facility (MMF) units which initially were to remain in place for three months to continuously assess air quality. These MMF units that were due to remain until the end of August 2021 are now being looked at to remain in place at least the end of the year.

These units are monitoring relevant parameters, including methane (CH₄) particulates and hydrogen sulphide (H₂S). It also has a weather station which records wind speed, direction, temperature, and pressure. Data has been collated into monthly reports which we have provided PHE so that they can offer expert opinion on any human health impacts.

In the March to April Health Risk Assessment Report of the Air Quality Monitoring Results, the monitoring results showed that the maximum concentrations of methane were significantly less than the levels deemed harmful by PHE. The monitoring results for particulate matter and nitrogen dioxide were below the UK air quality objectives. For the majority of the monitoring period, hydrogen sulphide levels were below the WHO 24-hour health based-guideline value. However, hydrogen sulphide levels still remain above WHO's 30-minute average odour annoyance guideline level.

The Environment Agency has ran regular virtual engagement events for the local community and stakeholders (fortnightly between the end of May and through June). The latest engagement event was a multi-agency event on 06 July 2021.

Our communication and engagement with stakeholders also includes a weekly public briefing which is uploaded to our Citizen Space page.

Since February 2021 an additional 500 cubic meters per hour of landfill gas is now being collected and managed by the gas plant. This has been made possible by having additional capping, the installation of additional gas extraction wells, and better sealing of the gas wells. Further capping on the flanks of the landfill is expected to commence at the end of July. This means nearly 70% of the site will be permanently or temporarily capped once the further capping has been completed.

Other measures being taken to minimise odour at this landfill include;

- capturing landfill gas and combusting it using a landfill gas engine or flare
- keeping the tipping area as small as possible
- covering waste as soon as possible
- keeping leachate levels low and avoiding over-tipping older areas of waste

We will continue to review our position and the response from the operator in accordance with our published enforcement guidance, relevant legislation, and the Regulators Code.

Marc Liddeth

Walleys Quarry Landfill - Project Executive