



Air Quality, Dust and Odour Appendices	
Pwllfawatkin Landfill, Neath Port Talbot	
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A1 References

Defra, 2007. *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*. s.l.:Defra.

Defra, 2019. *Clean Air Strategy 2019*. s.l.:s.n.

Defra, 2021a. *Local Air Quality Management Technical Guidance (TG16)*. s.l.:s.n.

Defra, 2021b. *Local Air Quality Management (LAQM) Support*. [Online]
Available at: <http://laqm.defra.gov.uk/>

European Parliament, Council of the European Union, 2008. *Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe*. s.l.:s.n.

FCC Environment, 2020. *Odour Management Plan Pwllfawatkin Landfill Site*. s.l.:s.n.

FCC, 2021. *Pwllfawatkin Landfill Site Dust Management Plan*. s.l.:s.n.

HMSO, 1990. *Environmental Protection Act 1990*. s.l.:s.n.

HMSO, 2000. *The Air Quality (Wales) Regulations 2000 (No. 1940)*. s.l.:s.n.

HMSO, 2002. *The Air Quality (Amendment) (Wales) Regulations 2002 (No. 3182)*. s.l.:s.n.

HMSO, 2010. *The Air Quality Standards (Wales) Regulations (No. 1433)*. s.l.:s.n.

IAQM, 2016. *Guidance on the Assessment of Mineral Dust Impacts for Planning*. s.l.:s.n.

IAQM, 2018. *Guidance on the Assessment of Odour for Planning V1.1*. s.l.:s.n.

Ministry of Housing, Communities & Local Government, 2019. *National Planning Policy Framework*. s.l.:s.n.

Neath Port Talbot County Borough Council, 2016a. *Local Development Plan (2011-2026)*. s.l.:s.n.

Neath Port Talbot County Borough Council, 2016b. *Pollution Supplementary Planning Guidance*. s.l.:s.n.

Neath Port Talbot County Borough Council, 2020. *2020 Air Quality Progress Report*. s.l.:s.n.

Welsh Government, 2021. *Planning Policy Wales Edition 11*. s.l.:s.n.

A2 Dust Impact Assessment Methodology

A2.1. Screening

- A2.1.1 A detailed dust assessment would usually be required where there is a human or sensitive ecological receptor within 250m of a sand and/or gravel site, measured from the nearest dust generating activities. Fugitive dust emissions due to operations at the landfill are likely to be similar to those from a sand/gravel site. Where there are no sensitive receptors within 250m of a sand and/or gravel site it would normally be assumed that a detailed dust assessment is not required.
- A2.1.2 The sensitivity of receptors is defined in **Table A1**, **Table A2** and **Table A3**; however, professional judgement should be used to identify where on the spectrum between high and low sensitivity a receptor lies.

A2.2. Dust Impact Risk and Magnitude of Dust Effect

- A2.2.1 The amenity dust impact risk is determined by combining the residual source emissions and the pathway effectiveness, as shown in **Table A4**. The magnitude of the dust effect is then described by combining the dust impact risk with the receptor sensitivity, as shown in **Table A5**. The significance of the effect on amenity is determined to be either significant or not significant. The judgement of significance should be made by a competent, suitably qualified professional, and the professional experience of the consultant preparing this report is set out in **Appendix A4**.
- A2.2.2 With regard to health effects, the IAQM minerals guidance takes the approach that, if background ambient PM₁₀ concentrations are below 17µg/m³, there is little risk that a process contribution from a dust source would lead to an exceedance of the objectives. For this assessment, should the background PM₁₀ concentration at the application site be less than 17µg/m³, the impact from the proposed development on health will be deemed as not significant.
- A2.2.3 Where background PM₁₀ concentrations are above 17 µg/m³, the impact has been described by estimating the contribution to annual mean PM₁₀ concentrations due to the operation of the proposed development and adding this to the background PM₁₀ concentration to determine the total annual mean PM₁₀ concentration and comparing this with the annual mean air quality objective.

Table A1: Sensitivities of People to Dust Soiling

Class	Principles	Examples
High	Users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.	Dwellings, museum and other culturally important collections, medium and long term car parks and car showrooms.
Medium	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or the appearance, aesthetics or value of their property could be diminished by soiling; or the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.	Parks and places of work.
Low	The enjoyment of amenity would not reasonably be expected; or property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.	Playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.

Table A2: Sensitivities of People to PM₁₀

Class	Principles	Examples
High	Locations where members of the public may be exposed for eight hours or more in a day.	Residential properties, hospitals, schools and residential care homes.
Medium	Locations where the people exposed are workers, and where individuals may be exposed for eight hours or more in a day.	Office and shop workers, but will generally not include workers occupationally exposed to PM ₁₀
Low	Locations where human exposure is transient.	Public footpaths, playing fields, parks and shopping streets.

Table A3: Sensitivities of Receptors to Ecological Effects

Class	Principles	Examples
High	Locations with an international or national designation and the designated features may be affected by dust soiling; or locations where there is a community of a particularly dust sensitive species.	Special Areas of Conservation (SAC) with dust sensitive features.
Medium	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition.	Sites of Special Scientific Interest (SSSI) with dust sensitive features.
Low	Locations with a local designation where the features may be affected by dust deposition.	Local Nature Reserves with dust sensitive features.

Table A4: Estimation of Dust Impact Risk

Pathway Effectiveness	Residual Source Emissions		
	Small	Medium	Large
Highly Effective	Low	Medium	High
Moderately Effective	Negligible	Low	Medium
Ineffective	Negligible	Negligible	Low

Table A5: Descriptors for Magnitude of Dust Effects

Dust Impact Risk	Receptor Sensitivity		
	Low	Medium	High
High	Slight Adverse	Moderate Adverse	Substantial Adverse
Medium	Negligible	Slight Adverse	Moderate Adverse
Low	Negligible	Negligible	Slight Adverse
Negligible	Negligible	Negligible	Negligible

Residual Source Emissions

A2.2.4 The IAQM guidance sets out examples of the residual source emissions magnitude for a number of activities (see **Table A6**). The residual source emissions take account of designed in mitigation measures and landscaping.

Table A6: Examples of Residual Source Emissions Magnitude

Large	Small
Materials Handling	
High no. heavy plant (>10 loading plant)	Low no. of heavy plant (<5 loading plant)
Unconsolidated / bare surface	Hard standing surface
Activities close to site boundary (<50m of site boundary)	Activities >100m of site boundary
Material of high dust potential	Material of low dust potential
On-site Transportation	
Unconsolidated/unpaved haul road	Conveyors and/or paved haul road
Road surface of high dust potential	Road surface of low dust potential
High no. of HDV movements (>250)	Low no. of HDV movements (<100)
High total haul road length	Low total haul road length (<500m)
Uncontrolled vehicle speed	Controlled vehicle speed (<15 mph)
Off-site Transportation	
High no. HDV movements (>200/day)	Low no. HDV movements (<25/day)
Unconsolidated access road	Paved access road
Limited/no vehicle cleaning facilities	Extensive vehicle cleaning facilities
Small length of access road (<20m)	Large length of access road (>50m)
Site Restoration	
Large working area	Small working area
High volume of material movement	Low volume of material movement
High number of heavy plant	Low number of heavy plant
Material of high dust potential	Material of low dust potential

Pathway Effectiveness

A2.2.5 A frequency category, derived from wind and rainfall data (**Table A7**), and a receptor distance category (**Table A8**) are combined in a matrix (**Table A9**) to classify the pathway effectiveness.

Table A7: Categorisation of Frequency of Potentially Dusty Winds

Frequency Category	Criteria
Infrequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are less than 5%
Moderately Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%
Very Frequent	The frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%

Table A8: Categorisation of Receptor Distance from Source

Receptor Distance Category	Criteria
Distant	Receptor is between 200m and 400m from dust source
Intermediate	Receptor is between 100m and 200m from dust source
Close	Receptor is less than 100m from dust source

Table A9: Pathway Effectiveness

Receptor Distance Category	Frequency of Potentially Dusty Winds			
	Infrequent	Moderately Frequent	Frequent	Very Frequent
Close	Ineffective	Moderately Effective	Highly Effective	Highly Effective
Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

A3 Odour Impact Assessment Methodology

- A3.1.1 The first step is to estimate the source odour potential, which takes account of the magnitude of the odour release, how inherently odorous the source is, the unpleasantness of the odour and the effectiveness of any mitigation. The examples in **Table A10** can be used to estimate the odour source potential.
- A3.1.2 The second step is to estimate the pathway effectiveness, or the odour flux to the receptor, based on distance from source to receptor, the frequency of winds from the source to the receptor, the effects of dispersion and dilution and the topography/terrain. The pathway effectiveness can be estimated using the examples in **Table A11**.
- A3.1.3 The third step is to consider the source odour potential and the pathway effectiveness together to determine the risk of odour exposure (the impact) at the receptors, using the matrix in **Table A12**.
- A3.1.4 The fourth step is to determine the sensitivity of the receptors to odour. Professional judgement, along with the general principles in **Table A13**, should be used to determine the sensitivity of the receptors.
- A3.1.5 Finally, the effect of the odour impact at the receptors, taking account of the receptor sensitivities, is determined using the matrix in **Table A14**.
- A3.1.6 The overall odour effect on the surrounding area, taking account of differing effect magnitudes at different receptors and the numbers of receptors affected, requires the application of professional judgement (the professional experience of the author of this report is set out in **Appendix A4**. Where the overall effect is greater than slight adverse, the effect is likely to be considered significant, with negligible or slight adverse impacts likely to be considered not significant.

Table A10: Source Odour Potential

Source Odour Potential	Magnitude of Odour Release	Offensiveness of Odour	Mitigation	Examples
Large	Materials use >100,000 tonnes/m ³ /yr, area source >1,000 m ²	Very odorous (e.g. mercaptans) with very low detection thresholds, most offensive, unpleasant (-2) to very unpleasant (-4) hedonic score	Open air operation, no containment, reliance solely on good management techniques and best practice	Large permitted processes of odorous nature or large sewage treatment works (STW)
Medium	Materials use >1,000 but <100,000 tonnes/m ³ /yr, area source >100m ² but <1,000 m ²	Moderately odorous, moderately offensive, neutral (0) to unpleasant (-2) hedonic score	Some mitigation measures in place, but significant residual odour	Smaller permitted processes or small STW
Small	Materials use <1,000 tonnes/m ³ /yr, area source <1,000 m ²	Mildly odorous with high odour detection threshold, less offensive, neutral (0) to very pleasant (+4) hedonic score	Effective, tangible mitigation measures in place leading to little or no residual odour	Falls below Part B threshold

Table A11: Pathway Effectiveness

Pathway Effectiveness	Distance	Direction	Dispersion/Dilution
High	Receptor adjacent to source, distance well below set-back distances	High frequency (%) of winds from source to receptor, or receptors downwind of source with respect to the prevailing wind	Open process with low level releases, e.g. lagoons, uncovered effluent treatment plant, landfilling of putrescible wastes
Moderate	Receptor local to the source	Medium frequency (%) of winds from source to receptor, or receptors neither upwind nor downwind of source with respect to the prevailing wind	Releases are elevated, but compromised by building effects
Ineffective	Receptor remote from source, distance exceeds official set-back distances	Low frequency (%) of winds from source to receptor, or receptors upwind of source with respect to the prevailing wind	Releases are from high level (e.g. stacks, or roof vents >3m above ridge height) and are not compromised by surrounding buildings

Table A12: Risk of Odour Impact at Receptors

Pathway Effectiveness	Source Odour Potential		
	Small	Medium	Large
High	Low	Medium	High
Moderate	Negligible	Low	Medium
Ineffective	Negligible	Negligible	Low

Table A13: Receptor Sensitivity

Sensitivity	Principles	Exposure	Examples
High	Users can reasonably expect enjoyment of a high level of amenity	People would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land	Residential dwellings, hospitals, schools/education and tourist/cultural
Medium	Users would expect to enjoy a reasonable level of amenity, but wouldn't reasonably expect to enjoy the same level of amenity as in their home	People wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land	Places of work, commercial/retail premises and playing/recreation fields
Low	Enjoyment of amenity would not reasonably be expected	Transient exposure, where people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land	Industrial, farms, footpaths and roads

Table A14: Odour Effect Descriptors for Impacts Predicted Qualitatively

Risk of Odour Exposure	Receptor Sensitivity		
	Low	Medium	High
High	Slight	Moderate	Substantial
Medium	Negligible	Slight	Moderate
Low	Negligible	Negligible	Slight
Negligible	Negligible	Negligible	Negligible

A4 Professional Experience

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Bob Thomas is a Director at AQA, with over fourteen years' experience in the field of air quality management and assessment. He has carried out air quality assessments for a wide range of developments, including residential, commercial, industrial, minerals and waste developments. He has been responsible for air quality projects that include ambient air quality monitoring of nitrogen dioxide, dust and PM₁₀, the assessment of nuisance odours and dust, and the preparation of Review and Assessment reports for local authorities. He has extensive dispersion modelling experience for road traffic, energy centre and industrial sources, and has completed many stand-alone reports and chapters for inclusion within an Environmental Statement. Bob has worked with a variety of clients to provide expert air quality services and advice, including local authorities, planners, developers, architects and process operators, and has provided expert witness services at public inquiry. He is a Chartered Scientist, a Member of the Institute of Air Quality Management and a Member of the Institution of Environmental Sciences.

A full CV for Bob Thomas is available at <http://aqassessments.co.uk/about>