Technical note on interpretation of 'Odour Impact Assessment for Cambridge Water Recycling Centre' (October 2018) as a material consideration in determining Planning Applications in the vicinity of Cambridge Water Recycling Centre

Purpose of this technical note

1 This technical note sets out how officers intend to interpret the results of the 'Odour Impact Assessment for Cambridge Water Recycling Centre' (October 2018), undertaken for the Councils by Odournet, in consideration of planning applications for development in the vicinity of Cambridge Water Recycling Centre (CWRC). Figure 1 shows the area which is covered by this note (later sections of this technical note explain how this area has been determined).

2 The Odournet study will be a material consideration in determining planning applications, alongside all other material planning considerations, for all development (including change of use) which will be regularly occupied or used, but does not apply to householder applications.

Background

3 At all water recycling centres (WRCs), sewage can give off odour when it is treated, or moved around during the treatment process. Although it is mainly water, sewage contains polluting materials that produce gases with odorous characteristics that can be detected when released into the air.

4 The amount of odour from a WRC and its dispersion depends on a range of factors including what is in the sewage, how long it takes to arrive at the sewage works, how it is treated during various stages, local topography, the direction and strength of the wind and how warm the weather is (sewage can smell more on hot days). Although the CWRC endeavors to use best practical means to minimise odour generation, inherently it is not possible to have absolute control over many of these issues to completely eliminate odours.

5 The Councils commissioned consultants Odournet to undertake an odour impact assessment, in order to assess the level and risk of odour impact posed by CWRC in the surrounding area. The results of this assessment will be used as a material consideration by the Councils to help inform future planning decisions in line with the planning policies in the Cambridge Local Plan (2018) and South Cambridgeshire Local Plan (2018).

Planning Policy

6 The National Planning Policy Framework (2019) aims to reduce air pollution and provide healthy and acceptable living conditions. Paragraph 127 which is concerned with achieving well-designed places, states that *'Planning policies and decisions should ensure that developments:… f) create places that are safe, inclusive and accessible and*

which promote health and well-being, with a high standard of amenity for existing and future users'.

7 Paragraph 180, states that *'planning policies and decisions should ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment'*.

8 Paragraph 182 is key and states that *'Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed'.*

9 The CWRC falls at the boundary of Cambridge City Council and South Cambridgeshire District Council and so policies in both authorities' Local Plans are of relevance.

10 Policy 36: Air quality, odour and dust of the Cambridge Local Plan (2018) relates to air pollution from all potential sources, including odour. Part b) of the policy states that where the proposed development is a sensitive end-use it will be permitted where it can be demonstrated that there will not be any significant adverse effects from existing poor air quality, sources of odour or other emissions to air. The policy goes on to state that any such impacts on the proposed use should be appropriately monitored and mitigated by the developer. The supporting text says that applicants shall, where reasonable and proportionate, prepare and submit with their application a relevant assessment, taking into account guidance current at the time of the application.

11 Policy SC/14 of the South Cambridgeshire District Local Plan deals with odour and other fugitive emissions to air. However, it mainly relates to new development which may generate malodours or emissions to air. The supporting text to the policy recognises that odour from sewage treatment works is an issue that is addressed by the Cambridgeshire and Peterborough Minerals and Waste LDF. Policy HQ/1: Design Principles, seeks to secure high quality design in all new development. Criterion (n) states that proposals must *'protect the health and amenity of occupiers and surrounding uses from development that is overlooking, overbearing or results in loss of daylight or development which would create unacceptable impacts such as noise, vibration, odour, emissions and dust'*.

12 Policy 15 of the Cambridge Local Plan and Policy SS/4 of the South Cambridgeshire District Local Plan are identical policies dealing with development in Cambridge Northern Fringe East and Cambridge North railway station. In line with this policy, the Councils are currently preparing a joint Area Action Plan for the site. As part of the development of the AAP, the relocation of CWRC is being considered, however if it is to

remain on the current site the policy states that all proposals should *'demonstrate that environmental and health impacts (including odour) from Cambridge Water Recycling Centre can be acceptably mitigated for occupants'*.

13 The Cambridgeshire and Peterborough Minerals and Waste Development Plan Core Strategy (2011) has a policy (CS31) on Waste Water Treatment Works (WWTW) Safeguarding Areas. These Safeguarding Areas assist in safeguarding waste management sites from incompatible development which may prejudice their use, and they extend 400 metres around existing treatment works, with a capacity exceeding 2000 population. This applies to the CWRC (Policy SSP W7I – Cambridge WWTW in the Site Specific Proposals Development Plan Document (2012)) and the Safeguarding Area is defined on the Local Plan Policies Maps for Cambridge and South Cambridgeshire. This Safeguarding Area is also shown in Figure 1 of this technical note. Within the Safeguarding Area Policy CS31 states that there is a presumption against allowing development which would be occupied by people, including new buildings or changes of use of buildings to residential, industrial, commercial, sport and recreation uses. Where new development is proposed within the Safeguarding Areas involving buildings which would normally be occupied, the application must be accompanied by an odour assessment report. The assessment must consider existing odour emissions from the waste water treatment works at different times of the year and in a range of different weather conditions. The policy goes on to say that planning permission will only be granted when it has been demonstrated that the proposed development would not be adversely affected by the continued operation of the existing waste water treatment works. The Waste Planning Authority must be consulted on any planning proposal within a Safeguarding Area, except householder applications or advertisements.

Odournet Report

14 The report 'Odour Impact Assessment for Cambridge Water Recycling Centre' (October 2018) was commissioned by Environmental Health Officers at both Councils and produced by Odournet. Environmental Health Officers at the Councils are fully supportive of the approach taken in the Odournet report, which in their view was conducted in accordance with all relevant published UK technical guidance issued by the Institute of Air Quality Management (IAQM), the Environment Agency and DEFRA. It is considered to be a reasonable representation of likely odour emissions from the CWRC site and provides robust predicted odour exposure levels in the area.

15 The study involved an odour measurement survey which was conducted at CWRC in summer 2017, targeting each individual odour source. The results of the survey were used alongside operational information for CWRC and odour measurement data collected at other UK sewage treatment works to define site and source specific odour emission estimates for each odour source of the works operations. Atmospheric odour dispersion modelling was then undertaken using the AERMOD computer modelling system in order to assess representative odour exposure levels (impacts) which are likely to occur around the site under the current and likely future long-term operational conditions.

16 The results of the odour assessment study are predicted odour exposure contours (of equal odour concentration units - ouE/m-3) in the vicinity of CWRC for each individual meteorological year of a 5 year dataset (2012 – 2016). The contours are based on the predicted 98th percentile (C98) value of hourly average odour concentration units (as advised in current UK guidance) and measured in European odour units per cubic metre of air (C98, 1-hour concentrations - ouE/m-3). Current practice for odour assessment for planning is to use the worst case year, which was 2013. These odour exposure contours are shown in Figure 5 of the study and repeated in this technical note at Figure 1.

Odour Impact and Annoyance

17 Odour annoyance occurs when a person exposed to an odour perceives it as unwanted or objectionable. The perception of the impact of odour and perceived odour annoyance involves not just the strength of the odour but also its **F**requency, **I**ntensity, **D**uration and **O**ffensiveness (the unpleasantness at a particular intensity) and the **L**ocation of the receptors (both indoor and outdoor). These attributes are known collectively as the FIDOL factors and are explained further in the Technical Appendix - Table 2: Description of the FIDOL factors.

18 The risk of annoyance from odour is also highly dependent upon how sensitive the use is. The IAQM Odour Planning Guidance 2018 sets out a table of receptor sensitivity to odours based upon the level of expected amenity and the length of time users would be exposed to odour (see Table 4: Receptor Sensitivity to Odours in the Technical Appendix 1 of this technical note). Uses such as residential, hospitals, schools are classified as high sensitivity because users would expect enjoyment of a high level of amenity and would be present for extended periods of time. Places of work and retail premises are classified as medium sensitivity and industrial and farm use, roads / footpaths are low sensitivity.

19 Section 2.3 of the Odournet study discusses at length the various odour criteria used in the UK which identify when an odour annoyance is likely to occur. It refers to the different acceptability criteria used in the UK by industry, regulators, relevant case law, Planning Inspectorate appeal decisions and consultant experience to determine the potential significance of odour effects.

20 The report states that there is no definitive precedent as to which criterion is suitable for either residential or non-residential premises. The majority of the guidance and legal/planning cases relating to odour focus on the risk of impact at residential premises which are considered as high sensitivity receptors. The report goes on to say that ‘ultimately the decision on which criteria to apply is for the Council based on their risk appetite’.

21 Further discussion about the significance of odour impact / effect and annoyance and how this technical note has been developed is set out in Technical Appendix 1.

Odour Exposure Level Acceptability Criterion for Planning Applications

22 After careful consideration by Environmental Health and Planning Officers at both Councils, taking into account the Odournet study and relevant guidance and case law reported in the study, the Councils' position is set out below.

23 Figure 1 shows the modelled worst case year (2013) from the Odournet Study and the odour exposure contours for 3, 5, 6 and 10 odour units (C98 1-hour ouE/m-3). It also shows the WWTW Safeguarding Area from the Minerals and Waste Site Specific Proposals Development Plan Document (2012).

24 If an application falls within any of the odour exposure contours, consideration should be given to Table 1 of this technical note, taking into account which contour the site falls within.

25 If an application falls within the WWTW Safeguarding Area, consideration must be given to Policy CS31, of the Cambridgeshire and Peterborough Minerals and Waste Local Plan Core Strategy (2011).

26 There will be some circumstances where an application falls in either the odour exposure contours or the WWTW Safeguarding Area, however there will also be cases where an application may fall within both. Later sections of this technical note set out what should be submitted alongside planning applications falling within the different areas and the need for pre-application discussions.

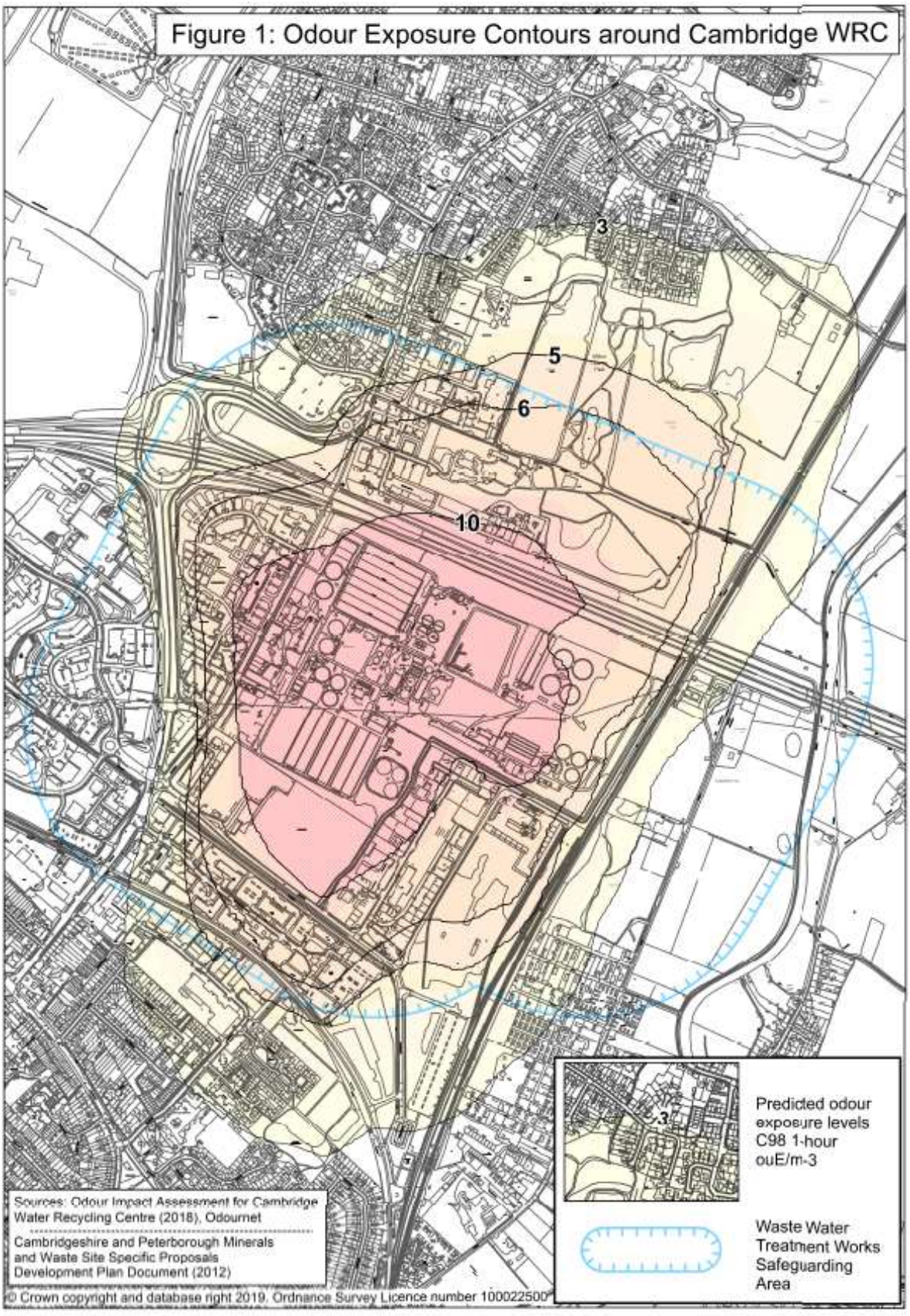
Figure 1: Odour Exposure Contours around Cambridge WRC
3
5
6
10
3
Predicted odour exposure levels C98 1-hour ouE/m-3
Waste Water Treatment Works Safeguarding Area
Sources: Odour Impact Assessment for Cambridge Water Recycling Centre (2018), Odournet
Cambridgeshire and Peterborough Minerals and Waste Site Specific Proposals Development Plan Document (2012)
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28 Table 1 below sets out the types of use which would be suitable in principle in each odour exposure contour. Where the table refers to 'new' uses this includes both new build and change of use.

29 Policy 36 of the Cambridge Local Plan states that where there may be significant impacts to proposed development from existing sources of odour, these should be appropriately mitigated. Suitable mitigation would also be required by Policy HQ/1 of the South Cambridgeshire Local Plan to protect the health and amenity of occupiers of new development. Table 1 sets out where mitigation may be possible and the types of mitigation that would be acceptable. However, even with mitigation some development may still be unsuitable, for example if it would result in poor living conditions for occupiers.

Table 1: Acceptability of development within different odour exposure contours in the vicinity of CWRC

Odour Exposure Contour (C98,ouE/m3)	**Types of development that are <u>unlikely</u> to be suitable even with mitigation**	**Types of development that <u>may</u> be suitable**	**Types of uses that are <u>likely</u> to be suitable**
3 to <5	**High Sensitivity Receptors** **NEW** high sensitivity receptors including residential, hospitals, school/educational uses and tourist/cultural uses (includes all uses in Use Classes C & D apart from outdoor playing/recreation fields).	**High Sensitivity Receptors** Extension / expansion of **ESTABLISHED EXISTING** residential, hospitals, school/educational uses and tourist/cultural uses (C & D planning use classes). This does not cover householder applications. Consideration may need to be given to possible mitigation.	**Medium Sensitivity Receptors** **NEW** and extension / expansion of **ESTABLISHED EXISTING** B1 (a) offices and (b) research and development, commercial / retail premises (A classes) and playing / recreation fields **Low Sensitivity Receptors** **NEW** and extension / expansion of **ESTABLISHED EXISTING** Low sensitivity receptors including industrial uses (B1(c), B2), storage and distribution (B8), farms,

Odour Exposure Contour (C98,ouE/m3)	**Types of development that are <u>unlikely</u> to be suitable even with mitigation**	**Types of development that <u>may</u> be suitable**	**Types of uses that are <u>likely</u> to be suitable**
			footpaths and roads
5 to <10	**High Sensitivity Receptors** **NEW** high sensitivity receptors including residential, hospitals, school/educational and tourist/cultural (C & D uses).	**High Sensitivity Receptors** Extension / expansion of **ESTABLISHED EXISTING** high sensitivity receptors including residential, hospitals, school/educational and tourist/cultural (C & D uses). **Medium Sensitivity Receptors** **NEW** and extension / expansion of **ESTABLISHED EXISTING** B1 (a) offices and (b) research and development, commercial / retail (A classes) premises and playing / recreation fields **with acceptable odour mitigation at receptor** e.g. no external seating areas, sealed external facades with building mechanical ventilation with odour abatement technology	**Low Sensitivity Receptors** NEW and extension / expansion of **ESTABLISHED EXISTING** Low sensitivity receptors including industrial uses (B1(c), B2), storage and distribution (B8), farms, footpaths and roads
10 and above	**High Sensitivity Receptors** NEW and extension/expansion of ESTABLISHED EXISTING high sensitivity receptors including residential,	**Medium Sensitivity Receptors** Extension / expansion of **ESTABLISHED EXISTING** B1(a) offices and (b) research and development,	-

Odour Exposure Contour (C98,ouE/m3)	Types of development that are <u>unlikely</u> to be suitable even with mitigation	Types of development that <u>may</u> be suitable	Types of uses that are <u>likely</u> to be suitable
	hospitals, school/educational and tourist/cultural (C & D uses). **Medium Sensitivity Receptors** **NEW** medium sensitivity receptors including B1(a) offices and (b) research and development, commercial / retail (A classes) premises and playing / recreation fields.	commercial / retail premises (A classes) **with proven and acceptable odour mitigation at receptor** e.g. no external seating areas, sealed external facades with building mechanical ventilation with odour abatement technology This could include the replacement of existing buildings with the same use. **Low Sensitivity Receptors** NEW and extension / expansion of **ESTABLISHED EXISTING** low sensitivity receptors including industrial uses (B1(c), B2), storage and distribution (B8), farms, footpaths and roads. Consideration may need to be given to possible mitigation.	

Odour Statement to be included with planning application

30 Having regard to policies in the Local Plans, if a planning application falls within the odour exposure contours in Figure 1 of this technical note it is recommended that it is accompanied with a statement setting out how the application has regard to this note and the following:

- the Councils' Odournet Report 'Odour Impact Assessment for Cambridge Water Recycling Centre' (October 2018);

- relevant Government, national and industry standards, codes of practice and best practice technical guidance; and
- The Institute of Air Quality Management (IAQM) 'Guidance on the assessment of odour for planning' (Version 1.1 - July 2018).

Minerals and Waste Plan requirements

31 If an application falls within the WWTW Safeguarding Area (shown on Figure 1), the application should be accompanied by the information required by Policy CS31 of the Minerals and Waste Core Strategy (2011). This requires that all planning applications for proposed new development involving buildings which would normally be occupied, must be accompanied by an odour assessment report. The assessment must consider existing odour emissions from the waste water treatment works at different times of the year and in a range of different weather conditions. The policy goes on to say that planning permission will only be granted when it has been demonstrated that the proposed development would not be adversely affected by the continued operation of the existing waste water treatment works. The Waste Planning Authority must be consulted on any planning proposal within a Safeguarding Area, except householder applications or advertisements.

Pre-application Discussions

32 Applicants are encouraged to enter into pre-application discussions with the Greater Cambridge Shared Planning Service, to determine the individual submission requirements of planning applications which fall within the areas identified in Figure 1.

APPENDIX 1 - Odour Annoyance and Impact

Odour Annoyance – A Brief Overview and Definitions

1.1 Exposure to odours that are perceived to be unpleasant can affect well-being at levels of exposure well below those that would lead to physiological or pathological effects, e.g. sleep disorders, headaches, respiratory problems.

1.2 Odour annoyance occurs when a person exposed to an odour perceives it as unwanted or objectionable. The perception of the impact of odour involves not just the strength of the odour (magnitude - measured as concentration) but also its **F**requency, **I**ntensity, **D**uration and **O**ffensiveness (the unpleasantness at a particular intensity) and the **L**ocation of the receptors. These attributes are known collectively as the FIDOL factors and are described in Table 2 below.

Table 2: Description of the FIDOL factors
(Institute of Air Quality Management (IAQM) 'Guidance on the assessment of odour for planning' - Version 1.1 - July 2018)

Frequency	How often an individual is exposed to odour
Intensity	The individual's perception of the strength of the odour
Duration	The overall duration that individuals are exposed to an odour over time
Offensiveness	Odour unpleasantness describes the character of an odour as it relates to the 'hedonic tone' (which may be pleasant, neutral or unpleasant) at a given odour concentration/ intensity. This can be measured in the laboratory as the hedonic tone, and when measured by the standard method and expressed on a standard nine-point scale it is termed the hedonic score.
Location	The type of land use and nature of human activities in the vicinity of an odour source. Tolerance and expectation of the receptor. The 'Location' factor can be considered to encompass the receptor characteristics, receptor sensitivity, and socio-economic factors.

1.3 The magnitude of the odour effect and annoyance potential experienced is determined by the scale of odour exposure (FIDO) and the sensitivity of the receptor (L, denoting the Location, which is often taken to be a surrogate for the sensitivity and incorporates the social and psychological factors that can be expected for a given community.)

1.4 Odour exposure is typically quantified in terms of a frequency of occurrence of hourly average concentrations above a certain limit odour concentration; e.g. European odour units per cubic metre of air (ouE/m-3) as a 98-percentile of hourly averages of odour concentration for a year with average meteorology (C98, ouE/m-3, 1-hour concentrations). Typical benchmark odour concentration exposure criteria - C98, ouE/m-3 indicative of the offensiveness / unpleasantness (annoyance /

unpleasantness spectrum) of various odour emission sources are given in Table 3 below.

Table 3: Benchmark Odour Concentration Exposure Level Criteria – Indicative of Offensiveness
(Derived from EA technical guidance note H4 Odour Management 2011)

Criterion, C98 ouE/m3	Offensiveness (unpleasantness)	Odour Emission Sources
1.5	Most Offensive	Processes involving decaying animal or fish remains **Wastewater treatment works - Processes involving septic effluent or sludge** Biological landfill odours
3.0	Moderately Offensive	Intensive livestock rearing **Sewage treatment works plant operating normally i.e. non-septic conditions** Fat frying (food processing) Sugar beet processing Well aerated green waste composting
6.0	Less Offensive	Brewery Confectionery Coffee

1.5 In accordance with the Institute of Air Quality Management (IAQM) 'Guidance on the assessment of odour for planning' (IAQM Odour Planning Guidance, 2018 - Version 1.1 - July 2018), the Councils agree and have decided that for odours that are less unpleasant, the level of odour exposure required to elicit the same effect may be somewhat higher, requiring professional judgement to be applied. For example, as in this case it has been decided that odours from sewage treatment works plant operating normally, i.e. non-septic conditions, would not be expected to be at the 'most offensive' end of the spectrum (Table 3 above) and can be considered on par with 'moderately offensive' odours such as intensive livestock rearing.

1.6 The risk of annoyance from odour is also highly dependent upon how sensitive the use is. The IAQM Odour Planning Guidance 2018 sets out a table of receptor sensitivity to odours, including the types of uses that would fall within each category (high, medium or low) which is recreated as Table 3 below.

Permitted Development Issues

1.7 The Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended) allows certain changes of use to high sensitive end uses (such as residential or educational uses) without requiring planning permission.

1.8 Permitted development rights can be removed by the Local Planning Authority, for example, by means of a condition on a planning permission. The restrictions imposed will vary on a case by case basis.

Table 4: Receptor Sensitivity to Odours
(Institute of Air Quality Management (IAQM) 'Guidance on the assessment of odour for planning' - Version 1.1 - July 2018)

For the sensitivity of people to odour, the IAQM recommends that the Air Quality Practitioner uses professional judgement to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the following general principles:	
High sensitivity receptor	Surrounding land where: • users can reasonably expect enjoyment of a high level of amenity; and • 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. Examples may include residential dwellings, hospitals, schools/education and tourist/cultural.
Medium sensitivity receptor	Surrounding land where: • 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; or • 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. Examples may include places of work, commercial/retail premises and playing/
Low sensitivity receptor	Surrounding land where: • the enjoyment of amenity would not reasonably be expected; or • there is transient exposure, where the 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. Examples may include industrial use, farms, footpaths and roads.

Significance of Odour Effects

1.9 The significance of an odour effect (risk of annoyance from odour) for planning purposes requires the careful consideration of the nature / level of odour exposure (Table 3 above - the impact) and the sensitivity of the proposed end use (Table 4 above).

1.10 The overall significance of the adverse odour effect in this guidance note has been determined considering a combination of the Odour Exposure Level (C98, ouE/m3) against Receptor Sensitivity, as shown in Table 5, below, which shows the impact descriptors proposed for a 'moderately offensive' odour.

Table 5: Proposed Significance of Adverse Odour Effect Descriptors for impacts predicted by modelling 'Moderately Offensive' odours
(recreated from Institute of Air Quality Management (IAQM) 'Guidance on the assessment of odour for planning' - Version 1.1 - July 2018)

Odour Exposure Level C98, ou_E/m^{-3}	Receptor Sensitivity		
	Low	Medium	High
≥10	Moderate	Substantial	Substantial
5-<10	Slight	Moderate	Moderate
3-<5	Negligible	Slight	Moderate
1.5-<3	Negligible	Negligible	Slight
0.5-<1.5	Negligible	Negligible	Negligible
<0.5	Negligible	Negligible	Negligible

Odour Exposure Level Acceptability Criteria for Planning Applications

1.11 The assessment of odour risk and effects from the operations conducted at the CWRC on potential future receptors of varying sensitivity was decided by consideration of the results of the Odournet survey, relevant case law and Inspectors decisions on past planning appeals. This has resulted in the following general odour contour concentration exposure threshold values / acceptability criteria that should be used for consideration of planning applications:

- $C_{98\ 1\text{-hour}}$ = 3 ou_E/m^{-3} (at 3 and above at which high sensitivity development such as residential premises is likely to be deemed unacceptable)
- $C_{98\ 1\text{-hour}}$ = 5 ou_E/m^{-3} (at 5 and above at which moderate / medium sensitivity development such as offices and commercial / retail is likely to be deemed unacceptable)
- $C_{98\ 1\text{-hour}}$ = 10 ou_E/m^{-3} (at 10 and above all development is likely to be deemed unacceptable)

1.12 These criteria have been used to develop Table 1 in this technical note.