PET CREMATORIUM, STRAWBRIDGES GARDEN CENTRE AND FARM SHOP

Odour Assessment

On Behalf of Strawbridges Garden Centre and Farm Shop
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1 Introduction

1.1 Greenavon Ltd was commissioned by Strawbridges Garden Centre and Farm Shop to provide an Odour Assessment to support an application for the proposed installation of a pet cremator at Strawbridges Garden Centre and Farm Shop, Doncaster Road, Darfield, Barnsley S71 5EZ.

1.2 The proposed development is located within 100 m of residential use and within 30 m of a café associated with the Strawbridges Garden Centre and Farm shop complex. These uses are considered to have high and medium respective sensitivity to odours. As such, the local planning authority, Barnsley Metropolitan Borough Council (BMBC), have requested that an odour assessment be undertaken to support the application.

1.3 The proposed cremator (The Addfield 'Mini-AB') includes an afterburner, which reportedly burns off all odours. The Mini-AB cremator has a maximum throughput of 50 kg an hour. As such, it is understood to require neither a 'Part A' Environmental Permit from the Environment Agency (EA), or a 'Part B' Permit from BMBC under the Local Air Pollution and Prevention and Control (LAPPC) regime. The specification sheet for the proposed cremator is included in Appendix A.

1.4 This report assesses the proposed cremator's impact on the local odour climate in line with best practice Institute of Air Quality Management (IAQM) odour guidance for planning. Odour management recommendations are also provided, covering the storage and handling of animal carcasses.

2 Policy Context

2.1 Odour in the UK is controlled by three principal legislative regimes. The planning system controls the siting of development that is odorous and sensitive to odour, whilst the Environmental Permitting (EP) Regulations[1] require the control of pollution including odour, from certain installations. Finally, existing sources of odour must not unreasonably or substantially interfere with the enjoyment of another premise, as part of the Statutory Nuisance provisions of the 1990 Environment Act[2].

2.2 This assessment is associated with a planning application and the maximum throughput of the Mini-AB is 50kg. According to Defra's process guidance note on animal carcase incineration, the proposed cremator would be classified as a low-capacity incinerator and would require neither a part A or Part B Environmental Permit.

National Planning Policy Framework

2.3 The revised National Planning Policy Framework (NPPF)[3], updated in July 2021, sets out government's planning policies for England and how these are expected to be applied. A key aim of the NPPF is to promote sustainable development and regarding conserving the natural environment, paragraph 174 states:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by: […]*
>
> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans".*

2.4 Paragraph 187 refers to the principal of the "agent of change", which sets out that new development must not place unreasonable restrictions on existing uses, by their introduction. It states:

> *"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."*

2.5 Paragraph 188 describes the relationship between EP and planning, regarding air missions it states:

[1] The Environmental Permitting (England and Wales) Regulations 2016 (SI/1154)
[2] Environmental Protection Act 1990 - Part 3 Statutory Nuisances and Clean Air
[3] Ministry of Housing, Communities & Local Government (2019a) National Planning Policy Framework.

> *"The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."*

2.6 Paragraph 185 relates to the appropriate siting of development and the assessment of cumulative effects, it states:

> *"Planning policies and decisions should also 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, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development."*

Local Planning Policy

2.7 BMBC Local Plan[4] is used by the Council to help determine planning applications in the borough. It contains policy of relevance to this assessment and odour, including:

> *"Policy Poll1 Pollution Control and Protection*
>
> *Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air, surface water and groundwater, noise, smell, dust, vibration, light or other pollution which would unacceptably affect or cause a nuisance to the natural and built environment or to people. We will not allow development of new housing or other environmentally sensitive development where existing air pollution, noise, smell, dust, vibration, light or other pollution levels are unacceptable and there is no reasonable prospect that these can be mitigated against. Developers will be expected to minimise the effects of any possible pollution and provide mitigation measures where appropriate."*

Odour Guidance

2.8 This assessment has been undertaken with reference to the following national and local guidance:

- IAQM (2018) Guidance on the assessment of odour for planning[5].
- Environment Agency (EA) H4 Odour Management Guidance[6].
- Defra's *Process Guidance Note 5/03(13) Statutory guidance for animal carcase incineration* (2013)[7].

[4] BMBC (2019) Local Plan: https://www.barnsley.gov.uk/LocalPlan
[5] IAQM (2018) Guidance on the assessment of odour for planning: https://www.iaqm.co.uk/text/guidance/odour-guidance-2014.pdf
[6] EA (2011) H4 Odour Management - how to comply with your environmental permit: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/296737/geho0411btqm-e-e.pdf
[7] Defra (2013) Process Guidance Note 5/03(13) Statutory guidance for animal carcase incineration: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/611479/process-guidance-note-animal_carcase-incineration.pdf

3 Methodology

Consultation

3.1 The proposed scope of work was sent via email, to BMBC's Environmental Health Team in July, asking for commentary on the proposed scope of work. As of yet, no response has been received.

Operational Phase Assessment

3.2 Best practice IAQM[5] and EA H4 guidance[6] advocate that multiple tools should be used in odour assessments to develop a "weight of evidence", as each tool has its own strengths and weaknesses.

3.3 IAQM guidance advocates that for existing sources, *"considerable weight should normally be given to the observational findings of community-based tools complaints analysis, community surveys and odour diaries) and sensory assessments (such as sniff tests)"*. However, as the proposed development will introduce a new emission source, it was not possible to rely on observational tools.

Odour Risk Assessment

3.4 IAQM guidance provides an odour risk assessment methodology based on the source-pathway-receptor (S-P-R) conceptual model, where the odour effect is a function of the *source* emission magnitude, duration and frequency, the effectiveness of the *pathway* to carry the odour, as well as the inherent sensitivity of the *receptor*.

3.5 The steps of the SPR assessment involve determining the risk of odour exposure (impact) at a location. This is undertaken by classifying the source odour potential as either small, medium or large, and factors that influence the odour potential include the offensiveness of the odour, the size of the installation, as well as the duration and frequency of any emissions from it.

3.6 The effectiveness of the pathway is determined as either ineffective, moderately ineffective, or highly effective based on the receptor's distance to the source, the prevailing wind direction, the effectiveness of the point of release (e.g., stack design), as well as the effect of any barriers or terrain between the source and the receptor.

3.7 The risk of odour exposure at any location is then determined using the criteria set out in Table 3.1 below, with the overall effect of that exposure dependent on the end-use, and the matrix set out in Table 3.2.

Table 3.1: Risk of Odour Exposure (Impact)

Table 10: Risk of odour exposure (impact) at the specific receptor location

		Source Odour Potential		
		Small	Medium	Large
Pathway Effectiveness	Highly effective pathway	Low Risk	Medium Risk	High Risk
	Moderately effective pathway	Negligible Risk	Low Risk	Medium Risk
	Ineffective pathway	Negligible Risk	Negligible Risk	Low Risk

Table 3.2: Likely magnitude of Odour effect

Table 11: Likely magnitude of odour effect at the specific receptor location

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

Dispersion Modelling Assessment

3.8 ADMS-Roads (Version.5.0.1.3) and ADMS 6 are a commercially available dispersion models, developed by CERC, that are routinely used for local air quality management and odour management across the UK.

3.9 ADMS-Roads can provide predictions of pollutant and odour concentrations, at key receptor locations or across a wider area, by combining odour emission factors, with meteorological data and approximations of the surface characteristics. ADMS-Roads was used to assess the proposed development's impact on the local odour climate.

Meteorological Inputs and Surface Characteristics

3.10 Three years (2019-2021) of hourly sequential meteorological data from Emley Moor meteorological station, the closest station to the application site, was used in the assessment. Data capture for wind speed and wind direction was sufficient (>95%) for the assessment; however, missing cloud cover data was provided from Bingley meteorological station, with any further missing cloud cover data imputed using the forward filling process.

3.11 The roughness of the model domain was assigned a value of 0.3m, which is representative of an agricultural area. The roughness of the meteorological site was chosen to be 0.2m, also reflective of a rural area.

3.12 Cities tend to have higher levels of atmospheric mixing resulting from the presence of buildings and the urban heat island effect and the atmosphere is, therefore, more unstable. The stability of the atmosphere in ADMS-Roads was represented by the Monin-Obukhov parameter, and a figure of 10m was chosen to reflect the rural nature of the model domain and meteorological sites.

Building Effects and Terrain

3.13 Buildings can have a significant effect on pollution concentrations in their vicinity. The main effect relates to the effect whereby pollutants can become entrained in the cavity region on the leeward side and be brought down to ground level rapidly. The inclusion of buildings in ADMS tend to increase concentrations close to the source and decrease them further away[8].

3.14 The proposed development is not located within, or adjacent to, a large building and the most sensitive uses are located at some distance from the plant. As such, buildings were not explicitly modelled in the assessment. An effective stack height of 0 m was however assumed, as opposed to the actual height of 3.77m to ensure a conservative approach.

3.15 As the terrain surrounding the application site is mostly flat, terrain was not modelled in the assessment.

Odour Emissions

3.16 The strength of an odour is measured in odour units (ou), with 1 ou often representing the odour detection threshold of the odorous compound, or compounds. In Europe, odour units are that are determined by a standard method and are defined and reported as European odour units (ouE).

3.17 The proposed cremator includes an afterburner and the specification sheet in appendix A reports that the cremator produces no odours (when operating normally). The specification sheet does not, however, provide odour emission factors (ouE/m^3). Defra's statutory guidance for animal carcase incineration for the purposes of the LAPPC regime (Process Guidance Note 5/03(13)[7], states that good combustion is the best way to minimise odours associated with animal carcase incineration. As such, it is considered likely that when normally operating the pet cremator would produce very little odour.

3.18 In the absence of a detailed odour emission data from Addfield, the manufacturers of the Mini-AB, this assessment has back-calculated the odour emission rate (ouE/s and ouE/m^2/s) that would have been necessary to cause a significant effect at neighbouring uses. This was achieved by iteratively running the model with increasing emission rates. The emission rate which resulted in significant effects was then compared to other processes with known emission factors, to qualitatively assess the risk that this emission rate would be exceeded.

3.19 In line with EA guidance, the 98th percentile of odour emissions was modelled. The modelling of the 98th percentile discounts the top 2% of modelled concentrations, allowing for occasional abnormal operation and weather conditions.

3.20 The inputs used in the model tool are set out in Table 3.3 below. The inputs are based on information provided by Addfield. which are reproduced in Appendix A.

[8] CERC (2023) ADMS 6 User Guide (Version 6.0)

Table 3.3: Inputs for the ADMS Model

Input	Value	Justification / Source
Stack Location (X, Y)	440545.9, 405221.1	Approximate location of proposed stack
Stack Height (m)	0	As the proposed stack height is not 2.5 times greater than the height of the building, nor greater than 1m above the ridge of the building, an 'effective stack height' of 0 m has been used.
Stack Diameter (m)	0.35	Email correspondence with Addfield
Exhaust velocity (m/s)	11.5	Calculated based on email correspondence with Addfield
Exhaust Temperature (℃)	850	Specification sheet for the Mini-AB
Volumetric Flow Rate (Am^3/s)	1.1	Calculated based on email correspondence with Addfield
Odour Emission Rate (ouE/s and $ouE/s/m^2$)	Variable	The emission rate was changed to identify the emission rate at which significant impacts might occur.
Hours of operation	8760	Worst case assumption assuming constant operation. However, the cremator will only be used between the hours of 8 am and 5 pm, and not constantly. As such, real hours of operation will be at most 2,555 hours per year.

Background Concentrations

3.21 The baseline odour environment was assumed to be odour free. No additional odour sources were included in the model or post-processing.

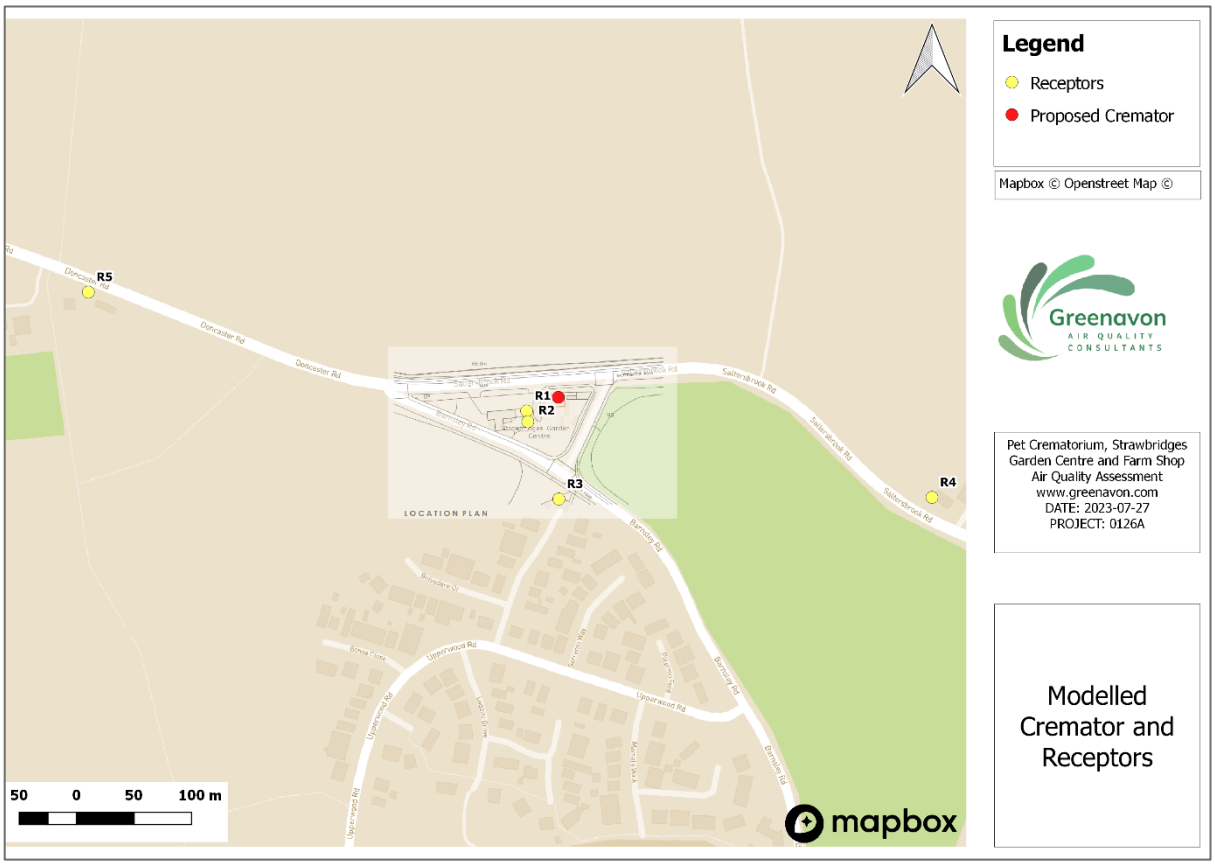
Receptors

3.22 Table 3.4 and Figure 3.1, below sets out details of the receptors explicitly modelled in the assessment. These receptors were chosen as they are the closest medium and high sensitivity receptors to the proposed cremator. All receptors were modelled at 1.5m height which is, by convention, "breathing height".

Table 3.4: Modelled Receptors

	Description	Receptor Sensitivity	X	Y
R1	Outdoor Café at Strawbridges Garden Centre	Medium	440518.3	405209.2
R2	Outdoor Café at Strawbridges Garden Centre	Medium	440519.3	405199.9
R3	Nearest dwelling to the south	High	440546.3	405132.6
R4	Nearest dwelling to the east	High	440870.9	405134
R5	Nearest dwelling to the west	High	440137.1	405312.6

Figure 3:1: Modelled Emission Source and Receptors



Judgement of Significance

3.23 The EA H4 Odour Management guidance[7] provides benchmarks for likely unacceptable levels of odour predicted by modelling. The benchmarks are based on the 98th percentile of hourly average concentrations of odour modelled over a year at receptor. The benchmarks are:

- 1.5 odour units for most offensive odours;
- 3 odour units for moderately offensive odours; and
- 6 odour units for less offensive odours.

3.24 The guidance provides examples of what would constitute less, moderately, and most offensive odours. These are reproduced below:

"Most offensive:

- *processes involving decaying animal or fish remains*
- *processes involving septic effluent or sludge*
- *biological landfill odours*

Moderately offensive

- *intensive livestock rearing*
- *fat frying (food processing)*

- *sugar beet processing*
- *well aerated green waste composting […]*

Less offensive

- *brewery*
- *confectionery*
- *coffee roasting*
- *bakery"*

3.25 Any residual odours from the cremator would be considered moderately offensive. Table 3.5 below sets out the IAQM's odour effect descriptors for impacts predicted by modelling for moderately offensive odours.

Table 3.5: IAQM's Proposed Odour Effect Descriptors for Impacts Predicted by Modelling, for Moderately Offensive Odours.

Table 7: Proposed odour effect descriptors for impacts predicted by modelling – "Moderately Offensive" odours

Odour Exposure Level C_{98}, 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

It should be noted that the Table applies equally to cases where there are increases and decreases in odour exposure as a result of this development, in which case the appropriate terms "adverse" or "beneficial "should be added to the descriptors.

3.26 The guidance suggests the threshold between slight and moderate adverse effects occurs when impacts are greater than 3 ouE (98th percentile) at high sensitivity receptors (e.g. residential dwellings), and at 5 ouE (98th percentile) at medium sensitivity receptors (e.g. cafes).

Uncertainty

3.27 Dispersion models use mathematical formulations to approximate the atmospheric dispersion of pollutants, emitted from a source or sources. There are several uncertainties associated with this process and further uncertainties associated with model inputs including weather and emission data.

3.28 Where possible, this assessment has chosen inputs that tend towards 'worst-case' results, to best account for uncertainties. For example, this assessment has considered three years of meteorological data and considered the years predicting the highest impact at the nearest receptors for comparison to the relevant criteria.

Overall Judgment of Significance and the Weight of Evidence.

3.29 Whilst the criteria outlined above provide a convenient means to describe impacts at specific receptors, the overall effect and significance of any odour impact has been based on professional judgment, drawing together the results of the individual tools, accounting for their specific strengths and weaknesses.

3.30 Where the odour emission source is an existing process, IAQM guidance advocates that significant weight should be placed on the results of observational tools. However, as the proposed development is not operational, the assessment was reliant on predictive methods. For this assessment significant weight has been placed on the results of the odour modelling assessment, which have incorporated conservative inputs, to add confidence to the results and conclusions drawn from them.

3.31 IAQM guidance states that overall effects considered *Moderate* or greater should be considered significant.

4 Operational Phase Assessment

Odour Risk Assessment

Source Magnitude

4.1 The proposed incinerator is equipped with an afterburner which reportedly results in zero odour emissions, according to the specification sheet in Appendix A. Furthermore, the proposed incinerator is small, with a maximum throughput below the threshold for requiring an Environmental Permit from the EA or from BMBC. As such, the source magnitude is considered 'Small'.

Pathway Effectiveness

4.2 Receptors R1 and R2 are located within 35m of the proposed stack, with little or no physical barriers between. Furthermore, the stack is not more than 2.5 times higher than the building within which it will be placed, which may result in pollution being drawn down to ground level. However, the receptors are not upwind of the prevailing wind and as such, winds from the cremator would rarely blow towards receptors R1 and R2. The proposed pathway from the cremator to receptors R1 and R2 is considered, at worst, 'Moderately Effective'.

4.3 Receptors R3, R4 and R5 are located at least 88m from the proposed stack. Furthermore, there are rows of trees between the receptors and the stack, which will promote turbulence and act as a barrier. As such, the pathway from the cremator to the receptors is considered 'Ineffective'.

Odour Risk Assessment

4.4 The results of the odour risk assessment are shown, below, in Table 4.1.

Table 4.1: Odour Risk Assessment

Receptor	Source	Pathway	Receptor	Odour Potential	Odour Exposure
R1	Small	Moderately Effective	Medium	Negligible	Negligible
R2		Moderately Effective	Medium	Negligible	Negligible
R3		Ineffective	High	Negligible	Negligible
R4		Ineffective	High	Negligible	Negligible
R5		Ineffective	High	Negligible	Negligible

4.5 The risk assessment in Table 4.1, undertaken in line with best practice IAQM guidance, suggests that the odour exposure at all receptors would be *Negligible*.

Dispersion Modelling Assessment

4.6 An iterative assessment was undertaken to assess the impact of the proposed development on the ambient odour concentrations. The results of this assessment are presented in Table 4.2 The highest concentration at medium or high sensitivity receptors, predicted based on three years of meteorological data are presented.

Table 4.2: Impact of the Proposed Development on Odour Concentrations (98th percentile)

Odour emission Rate (ouE/m²/s)	Maximum Concentration at High Sensitivity receptor	Maximum Concentration at Medium Sensitivity receptor
54,048 (5,200 ouE/s)	0.94	4.71
57,166 (5,500 ouE/s)	0.90	4.98
60,284 (5,800 ouE/s)	0.85	5.25

4.7 The data in Table 4.2 show that it would require an emission rate between 5,500 ouE/s and 5,800 ouE/s to potentially cause a significant effect at the café in Strawbridges Garden Centre. The impact at the nearest highly sensitive uses would not have the potential to cause a significant effect there, at these emission rates, even if the odour was highly offensive.

4.8 Table 4.3 below includes several emission factors for processes within wastewater treatment works (WwTW), taken from UKWIR guidance[9].

Table 4.3: Odour Emission Factors (ou/s/m²) for Sewage Treatment Works, taken from UKWIR Guidance

Processes	Odour Potential (ou/m³) - Emission rate (ou/s/m²)							
	Low		Typical		High		Very high	
	Odour potential	Odour emission rate	Odour potential	Odour emission rate	Odour potential	Odour emission rate	Odour potential	Odour emission rate
Screen	2,000	20	5,000	50	20,000	200	200,000	2,000
Grit channel	2,000	21	5,000	53	20,000	210	200,000	2,100
Channel to primary tank	2,000	2.5	5,000	6.2	20,000	25	200,000	250
Distributor to primary tank	2,000	100	5,000	250	20,000	1,000	200,000	10,000
Primary tank including weirs	2,000	0.8	5,000	1.9	20,000	7.5	200,000	76
Distributor to aeration tank	2,000	1,000	5,000	250	20,000	1,000	200,000	10,000
Activated sludge process with diffused aeration	1,000	2.0	2,000	4.0	5,000	10	20,000	40
Activated sludge with surface aeration	1,000	5.0	2,000	10	5,000	25	20,000	100
Final tank	1,000	0.3	2,000	0.7	5,000	1.7	10,000	3.4
Tertiary treatment using BAF	500	2.7	1,000	5.4	5,000	27	10,000	54
Quiescent raw sludge tank/lagoon	1,000,000	7.9	5,000,000	40	10,000,000	80	20,000,000	160
Raw sludge tank with some disturbance of sludge	1,000,000	140	5,000,000	710	10,000,000	1,400	20,000,000	2,800
SAS tank	1,000	0.1	2,000	0.3	5,000	0.7	20,000	2.8
Digested sludge tank	100,000	14	500,000	71	2,000,000	280	10,000,000	1,400
Sludge cake[2]	old, digested	0.8	fresh, digested	62	raw	80	during disturbance	800

4.9 An odour emission rate of 60,284 ouE/s/m² is far greater than the odour emission rates that would be expected from any process in a sewage treatment works, including a sewage treatment works with very high odour emissions.

[9] UKWIR (2006) Best Practicable Means (BPM) – A Guidebook for Odour Control at Wastewater Treatment Works (06/WW/13/8) https://ukwir.org/eng/reports/06-WW-13-8/115342/Best-Practicable-Means-BPM--A-Guidebook-for-Odour-Control-at-Wastewater-Treatment-Works

5 Odour Mitigation

5.1 Whilst significant impacts are not expected from the proposed stack, the handling of animal carcasses could also result in emissions of odour. Defra's *Statutory guidance for animal carcase incineration* recommends a series of measures that can be used to manage odours associated with handling and storage. These include:

> *"Odour from the receipt, handling and storage of animal carcases may cause offence at or beyond the process boundary. Prevention should involve:*
>
> - *the careful siting of animal carcase storage;*
> - *setting different maximum storage times for un-refrigerated, refrigerated and frozen carcases; (up to one shift un-refrigerated may be reasonable, but if odour problems are expected or caused then refrigeration should be provided)*
> - *preventing spillage of solid or liquids while carcases are being transferred e.g. carcases should be carried not dragged, e.g. half-barrel shovel for carrying carcases avoids dripping;*
> - *vehicles, containers, trailers storage areas, loaders and all equipment should be designed for easy cleaning and disinfection, impervious and kept clean;*
> - *storage areas where carcases are handled should have a resistant finish and slope to a holding pit"*

5.2 It is anticipated that animal carcasses would not be stored for a long time prior to being incinerated at the site. As such, it is considered that there would be limited potential for odours to form. Nevertheless, it is recommended that the operator creates a basic odour management plan based around routine odour inspections to ensure that odours associated with the storage and handling of animal carcasses are minimised.

6 Discussion

6.1 Local and National planning policy seeks to prevent development causing, or being put at risk of, unacceptable odour impacts.

6.2 The proposed development is in a rural area and no other major odorous sources in the vicinity could be identified.

6.3 Best practice IAQM and EA guidance advocates that several odour assessment tools should be considered together to develop a "weight of evidence" to support the conclusions of any odour assessment. As the proposed cremator is not yet operational, observational tools could not be relied upon and as such, an odour risk assessment and odour dispersion modelling were undertaken.

6.4 The qualitative odour risk assessment was undertaken in line with best practice IAQM guidance and concluded that the likely odour exposure at local sensitive receptors would be *Negligible*.

6.5 An ADMS assessment was also undertaken to calculate the odour emission rate from the proposed cremator that would be required to cause a significant impact at the closest sensitive receptors. Through an iterative process, an odour emission rate of between 5,500-5,800 ouE/s was identified as being likely to cause a significant effect at local sensitive receptors. This emission rate is, however, far greater than any emission rate from a WwTW reported in the UKWIR's *Guidebook-for Odour Control a Wastewater Treatment-Work*. As such, the emission rate from the proposed cremator would have to be greater than those experienced at a WwTW to have the potential to be significant.

6.6 The ADMS assessment also incorporated several worst-case assumptions, including that the proposed development would be constantly operational, when hours of operation per year would not, in fact, exceed 2555. Given the worst-case assumptions and that odour emissions from the proposed cremator are reportedly 'odour free' post, it is considered highly unlikely that odour emissions from the proposed cremator would have the potential to cause significant impacts at any location.

6.7 Emissions associated with the proposed cremator are not, therefore, considered to have the potential to cause significant effects, and no further mitigation is required. The storage and handling of deceased pets may also result in emission of odour. Care should be taken to limit the amount of time carcasses are stored and to ensure that there are appropriate cleaning protocols. It is strongly recommended that the operator develop a simple odour management plan based around routine inspections to ensure that odours from the proposed development are minimised.

7 Conclusions

7.1 Greenavon Ltd was commissioned by Strawbridges Garden Centre and Farm Shop to provide an Odour Assessment to support an application for the proposed installation of a pet cremator at Strawbridges Garden Centre and Farm Shop, Doncaster Road, Darfield, Barnsley S71 5EZ.

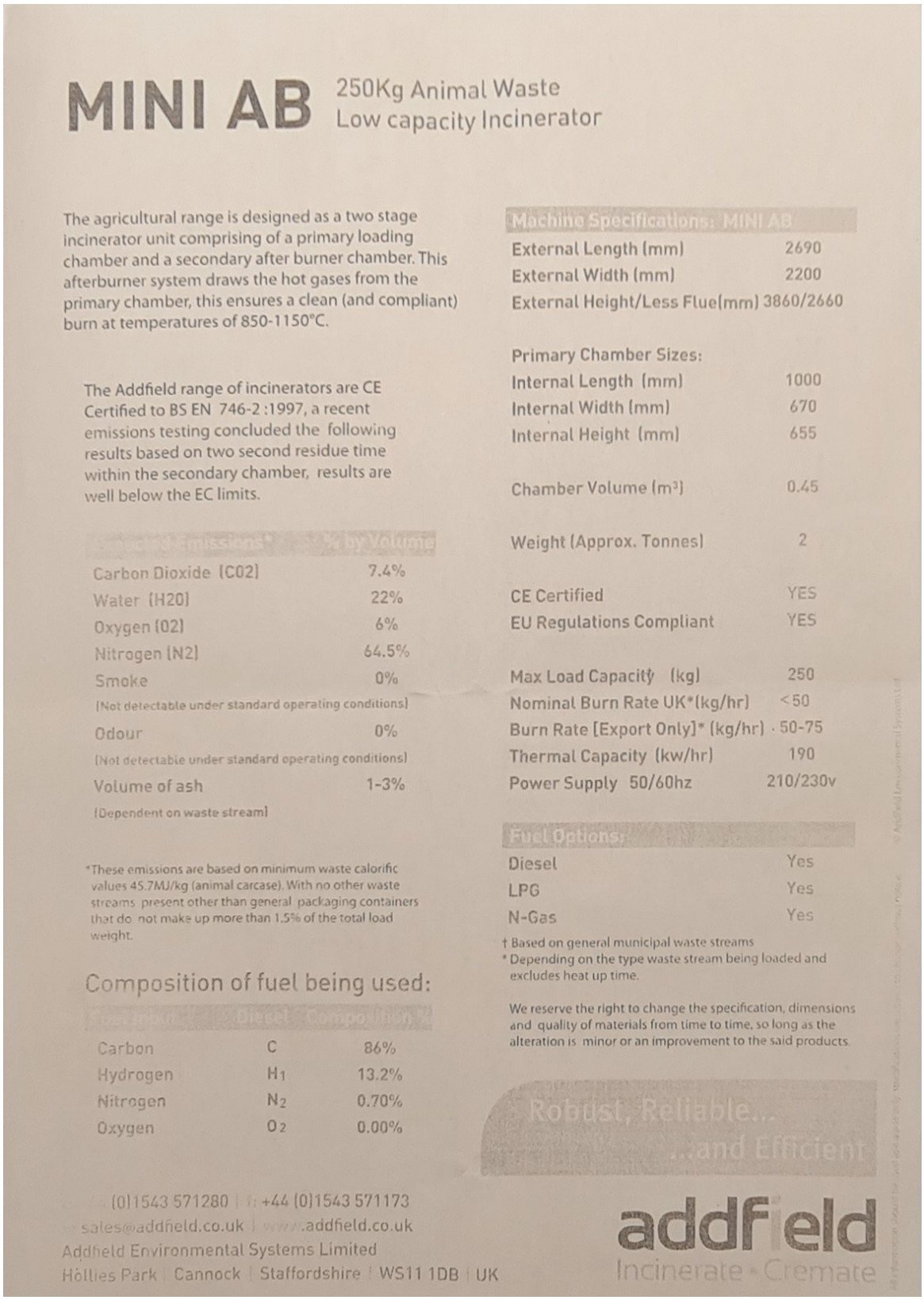
7.2 An odour assessment was required to assess the potential impacts on local sensitive receptors, including nearby residential use and a café within Strawbridges Garden Centre.

7.3 Odour emissions from the proposed cremator are reportedly odour free and this assessment demonstrates that the odour emission rate from the cremator would have to be greater than any process within a WwTW. As this is highly unlikely, it can be concluded that odours associated with the proposed development do not have the potential to significantly impact the local odour climate.

7.4 The operator should ensure there are appropriate measures in place to minimise emissions from the storage and handling of animal carcasses, through a basic odour management plan.

7.5 Considering the above, odour should not, therefore, present any significant obstacles to the planning process.

Appendix A: Specification Sheets and Emissions Data



MINI AB 250Kg Animal Waste Low capacity Incinerator

The agricultural range is designed as a two stage incinerator unit comprising of a primary loading chamber and a secondary after burner chamber. This afterburner system draws the hot gases from the primary chamber, this ensures a clean (and compliant) burn at temperatures of 850-1150°C.

The Addfield range of incinerators are CE Certified to BS EN 746-2 :1997, a recent emissions testing concluded the following results based on two second residue time within the secondary chamber, results are well below the EC limits.

Emissions*	% by Volume
Carbon Dioxide (C02)	7.4%
Water (H20)	22%
Oxygen (02)	6%
Nitrogen (N2)	64.5%
Smoke	0%
(Not detectable under standard operating conditions)	
Odour	0%
(Not detectable under standard operating conditions)	
Volume of ash	1-3%
(Dependent on waste stream)	

*These emissions are based on minimum waste calorific values 45.7MJ/kg (animal carcase). With no other waste streams present other than general packaging containers that do not make up more than 1.5% of the total load weight.

Composition of fuel being used:

Fuel Input	Diesel	Composition %
Carbon	C	86%
Hydrogen	H_1	13.2%
Nitrogen	N_2	0.70%
Oxygen	O_2	0.00%

Machine Specifications: MINI AB	
External Length (mm)	2690
External Width (mm)	2200
External Height/Less Flue(mm)	3860/2660
Primary Chamber Sizes:	
Internal Length (mm)	1000
Internal Width (mm)	670
Internal Height (mm)	655
Chamber Volume (m^3)	0.45
Weight (Approx. Tonnes)	2
CE Certified	YES
EU Regulations Compliant	YES
Max Load Capacity (kg)	250
Nominal Burn Rate UK*(kg/hr)	<50
Burn Rate (Export Only)* (kg/hr)	50-75
Thermal Capacity (kw/hr)	190
Power Supply 50/60hz	210/230v

Fuel Options:	
Diesel	Yes
LPG	Yes
N-Gas	Yes

† Based on general municipal waste streams
* Depending on the type waste stream being loaded and excludes heat up time.

We reserve the right to change the specification, dimensions and quality of materials from time to time, so long as the alteration is minor or an improvement to the said products.

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Expected Emmision Data

Brand: Addfield
Equipment: MINI AB Incinerator

Below are the expected emissions from the Addfield MINI AB machines. Operating at a nominal throughput of <50kg/hr, with a secondary after chamber in place with a minimum temperature of 850 deg.C

Parameter (EN)	Addfield
Particulate Matter	16 mg/Nm3
NOx	180/Nm3
SOx	62mg/Nm3
CO	42mg/Nm3
Total VOC (As carbon)	0.6mg/Nm3
Heavy Metals	0.05mg/Nm3
HCl	1.04mg/Nm3
HF	0.07mg/Nm3

4000m3/hour
The stack diameter is 350mm internally.

James Grant
Operations Director

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