Scotts of Thrapston

Air Quality Assessment

February, 2023

Scotts of Thrapston

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Glossary of terms

Term	Definition
AQA	Air Quality Assessment
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Standard
AEL	Associated Emission Levels
ASR	Annual Status Report
AW	Ancient Woodland
CERC	Cambridge Environmental Research Consultants
DCLG	Department for Communities and Local Government
Defra	Department for Environment, Food and Rural Affairs
DS	DustScanAQ
EA	Environment Agency
EAL	Environmental Assessment Level
EPUK	Environmental Protection UK
EQS	Environmental Quality Standard
EU	European Union
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LNR	Local Nature Reserve
LWS	Local Wildlife Site
MMOL	Minimum Monin-Obukhov Length
NAQS	National Air Quality Strategy
NNC	North Northamptonshire Council
NNR	National Nature Reserve
NO	Nitric oxide
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
NRMM	Non-road Mobile Machinery
PC	Process Contribution

Term	Definition
PEC	Predicted Environmental Concentration
PM	Particulate Matter
Ramsar Sites	Designated Wetland
SAC	Special Areas of Conservation
SPA	Special Protection Areas
SSSI	Sites of Special Scientific Interest
WHO	World Health Organisation

1 Introduction

1.1 Overview

Scotts of Thrapston are seeking planning permission for the operation of a biomass boiler at their site at Bridge Street, Thrapston NN14 4LR. The proposed comprises the installation and operation of a MWE199 boiler of heat output 199 kW. The boiler is intended to operate under the government's Renewable Heat Incentive scheme.

DustScanAQ (DS) have been instructed by CC Town Planning to produce an Air Quality Assessment in support of the planning application to be submitted to the Local Authority.

Local Authorities are tasked with determining local planning applications against a wide range of social, economic and environmental criteria. As the proposed development has the potential to introduce new emission sources to the area, this report provides an assessment of potential air quality impacts to accompany the planning application. The Local Authority responsible for determining the planning application is North Northamptonshire Council (NNC).

The potential local air quality effects of the power plant have been assessed using the latest guidance from the Environment Agency (EA), Environmental Protection UK (EPUK), the Institute of Air Quality Management (IAQM)[1] and the Department for Environment, Food and Rural Affairs (Defra)[2].

1.2 Objective

This report provides an assessment on the following key impacts associated with the operation of the power plant:

- The risk of the impacts from the operation of the biomass boiler on meeting the national air quality objectives.

1.3 Site Location

The assessment site is located at Scotts of Thrapston, Bridge Street, Thrapston NN14 4LR. The site is located on a small industrial estate on the north side of Bridge Street. The estate is bordered directly to the west by a residential housing estate and to the east by another industrial estate. The location of the proposed biomass boiler is at the year of the Scotts of Thrapston building on site, set back approximately 100 m from Bridge Street, and 35 m from the residential estate.

The location of the site is shown in Figure 1.1.

[1] IAQM (2017): 'Land Use Planning and Development Control: Planning for Air Quality v1.2'.
[2] Defra (2022): 'Local Air Quality Management – Technical Guidance (TG22)'.

Figure 1.1: Site Location

1.4 Key Pollutants

1.4.1 Nitrogen Dioxide (NO_2)

NO_2 and nitric oxide (NO) are collectively referred to as oxides of nitrogen (NO_x). During fuel combustion, atmospheric nitrogen combines with oxygen to form mainly NO, which is not considered harmful, and some NO_2 (typically in a ratio 95:5). Through a chemical reaction with ozone (O_3), NO further combines with oxygen to create NO_2 which can be harmful to human health and vegetation, and is a regulated pollutant.

The foremost sources of NO_2 in the UK are combustion activities, mainly road transport and power generation. According to the National Atmospheric Emissions Inventory (NAEI), road transport is now the largest single UK source of NO_x, accounting for almost one third of UK emissions.

1.4.2 Particulate Matter (PM_{10})

Particulate matter refers to a mixture of solid particles and liquid droplets found in air. These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye. Others can only be detected using an electron microscope. Fine dust, particles up to 10 microns (µm) in aerodynamic diameter, are commonly referred to as PM_{10}, which is a regulated pollutant.

PM_{10} is known to arise from sources such as construction sites, road traffic movements and industrial and agricultural activities. Very fine particles ($PM_{2.5}$ – $PM_{0.1}$) are known to be associated with pollutants such as oxides of nitrogen (NO_x) and sulphur dioxide (SO_2) emitted from power plants, industrial installations and road transport sources.

2 Legislation and Policy

This section summarises all legislation, policy, statutory and non-statutory guidelines relevant to the operation. Furthermore, the latest local planning policy guidance specifically applicable to the operation has been reviewed.

2.1 International (European Union)

The European Union (EU) sets legally binding limit values for outdoor air pollutants to be met by EU countries by a given date. These limit values are based on the World Health Organisation (WHO) guidelines on outdoor air pollutants. These are legally binding and set out to protect human health and the environment by avoiding, preventing or reducing harmful air pollution effects.

Directive 2008/50/EC[3] on ambient air quality and cleaner air for Europe entered into force in June 2008. This merged the existing 'Daughter' Directives[4,5,6,7] (apart from the fourth Daughter Directive), maintaining existing air quality objectives set out by 'Daughter' Directives for:

- Sulphur dioxide (SO_2);
- Nitrogen dioxide (NO_2);
- Oxides of nitrogen (NO_x);
- Particulate matter ($PM_{2.5}$ and PM_{10});
- Lead (Pb);
- Benzene(C_6H_6);
- Carbon monoxide (CO); and
- Ozone (O_3).

Directive 2008/50/EC also includes related objectives, exposure concentration obligations and exposure reduction targets for $PM_{2.5}$ (fine particles). The 'Daughter' Directives were based upon requirements set out in the first EU Ambient Air Quality Framework Directive 96/92/EEC[8].

2.2 National (England)

[3] European Union. (2008), 'Ambient air quality assessment management', Framework Directive 2004/50/EC.
[4] European Union. (1999), 'Ambient air quality assessment management', Framework Directive 1999/30/EC.
[5] European Union. (2000), 'Ambient air quality assessment management', Framework Directive 2000/3/EC.
[6] European Union. (2002), 'Ambient air quality assessment management', Framework Directive 2002/3/EC.
[7] European Union. (2004), 'Ambient air quality assessment management', Framework Directive 2004/107/EC.
[8] European Union. (1996), 'Ambient air quality assessment management', Framework Directive96/62/EC.

The 2008 EU ambient air quality directive 2008/50/EC was transposed into English law through the introduction of the Air Quality (Standards) Regulations in 2010[9] which also incorporated the fourth EU Daughter Directive (2004/107/EC) that set target values for certain toxic heavy metals and polycyclic aromatic hydrocarbons, (PAH).

The UK government has a legal responsibility to meet the EU limit values. Part IV of the 1995 Environment Act[10] sets guidelines for protecting air quality in the UK and forms the basis of local air quality management. The Environment Act requires local authorities in the UK to review air quality in their area periodically and designate AQMAs where the objectives are not being achieved or are not likely to be achieved within the relevant period. Where an AQMA is designated, local authorities are also required to produce an 'Air Quality Action Plan' (AQAP) detailing the pollution reduction measures that need to be adopted to achieve the relevant air quality objectives within an AQMA.

As part of the Environment Act, the UK Government was required to publish a National Air Quality Strategy (NAQS) to establish the system of 'local air quality management' (LAQM) for the designation of AQMAs. This led to the introduction of the first Air Quality Strategy (AQS) in 1997[11] which has since progressed through several revisions until it was replaced by the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007[12]. Each revision introduced strategies and regulations that considered measures for different pollutants by tightening existing objectives and also by introducing new ones to establish a common framework to protect human health and the environment by achieving ambient air quality improvements.

The government published a Clean Air Strategy[13] in 2019 which sits alongside the 2007 Air Quality Strategy. It says:

> *"We will minimise the air quality impacts of the Renewable Heat Incentive Scheme and tackle non-compliance."*

2.2.1 National Planning Policy Framework

The principal national planning policy guidance in respect of the consented development is the National Planning Policy Framework (NPPF)[14]. The most recent update of the NPPF was published in February 2019 by the Department for Communities and Local Government (DCLG).

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[9] Statutory Instrument. (2010), 'The Air Quality Standards Regulations', No. 1001. Queen's Printer of Acts of Parliament.
[10] Parliament of the United Kingdom. (1990), 'Environmental Protection Act', Chapter 43. Queen's Printer of Acts of Parliament.
[11] Department for Environment Food and Rural Affairs. (1997), 'The United Kingdom National Air Quality Strategy', Cm 3587, Department for Environment Food and Rural Affairs.
[12] Department for Environment Food and Rural Affairs. (2007), 'The Air Quality Strategy for England, Scotland, Wales and Northern Ireland', Cm 7169, Department for Environment Food and Rural Affairs.
[13] https://www.gov.uk/government/publications/clean-air-strategy-2019/clean-air-strategy-2019-executive-summary
[14] National Planning Policy Framework. Accessible at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

The NPPF 2019 contains five sections which are relevant to air quality.

Section 103 states that:

> *"The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making."*

Section 170 (e) states that:

> *"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…"*

Section 180 states that:

> *"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*."

Section 181 states that:

> *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*

Section 183 states that:

> *"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."

2.2.2 National Planning Practice Guidance

The DCLG published a number of supporting web based resources of Planning Practice Guidance (PPG)[15] to supplement the NPPF. With respect to air quality the PPG[16] provides guidance on when air quality is relevant to a planning application. It states that:

"Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity."

The PPG also states that, when deciding whether air quality is relevant to a planning application, the applicant should consider whether the proposal will:

"Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield……

Introduce new point sources of air pollution…..,

Expose people to harmful concentrations of air pollutants …..,

Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations….,

Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value."

2.2.3 Relevant Air Quality Standards

A summary of the relevant Air Quality Objectives (AQO) for human health receptors is presented in Table 2.1 below.

A summary of where standards referred to in Table 2.1 are applicable is presented in Table **2.2**.

[15] National Planning Practice Guidance web-based resource. Accessible at: http://planningguidance.planningportal.gov.uk/
[16] Paragraph: 005 Ref ID 32-005-20140306, revision date 01.11.2019

Table 2.1: Air Quality Standards

Pollutant	Averaging Period	AQS/ EAL ($\mu g/m^3$)	Exceedance Allowance	Percentile Equivalent
Nitrogen Dioxide (NO_2)	Annual	40	-	-
	1-hour	200	18 per annum	99.8th
Particulate Matter (as PM_{10})	Annual	40	-	-
	24-hour	50	35 per annum	90.4th

AQS = Air Quality Standard; EAL = Environmental Assessment Level.

Table 2.2: Examples of where the AQO should apply

Averaging period	Objectives should apply at	Objectives should not apply at
Annual	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
24 Hour	All locations where the annual mean objective would apply, together with hotels and gardens of residential properties[a].	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
1 Hour	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably have expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

Note:

(a) "*Such locations should represent parts of the garden where relevant public exposure to pollutants is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure to pollutants would occur at the extremities of the garden boundary, or in front gardens, although local judgement should always be applied.*"

Source:

Department for Environment Food and Rural Affairs (2016): 'Local Air Quality Management Technical Guidance' (TG.16).

2.2.4 Statutory Nuisance

It is recognised that the planning system presents a way of protecting amenity. However, in cases where planning conditions are not applicable to a development/installation, the requirements of the Environmental Protection Act 1990 still apply. Under Part III of the Environmental Protection Act 1990, local authorities have a statutory duty to investigate any complaints of:

> *"any premises in such a state as to be prejudicial to health or a nuisance*
>
> *smoke emitted from premises so as to be prejudicial to health or a nuisance*
>
> *fumes or gases emitted from premises so as to be prejudicial to health or a nuisance*
>
> *any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance*
>
> *any accumulation or deposit which is prejudicial to health or a nuisance"*

Where the local authority establishes that any one of these issues constitutes a statutory nuisance and believes it to be unreasonably interfering with the use or enjoyment of someone's premises and/or is prejudicial to health, an abatement notice will be served on the person responsible for the offence or the owner / occupier. Failure to comply with the notice could lead to a prosecution. It is however considered as a defence if the best practicable means to prevent or to counteract the effects of the nuisance are employed.

2.3 Local (North Northamptonshire Council)

2.3.1 North Northamptonshire Joint Core Strategy 2011-2031

The current Local Plan covering Thrapston consists of the North Northamptonshire Joint Core Strategy 2011-2031[17], adopted 14 July 2016, and the Rural North, Oundle and Thrapston Plan, adopted July 2011. The Joint Core Strategy contains one policy relevant to air quality and development. Policy 8 states:

> *"Development should:*
>
> *…*
>
> *e) Ensure quality of life and safer and healthier communities by:*
>
> > *i. Protecting amenity by not resulting in an unacceptable impact on the amenities of future occupiers, neighbouring properties or the wider area, by reason of noise, vibration, smell, light or other pollution, loss of light or overlooking;*

[17] North Northamptonshire Joint Planning Unit, 2016. 'North Northamptonshire Joint Core Strategy 2011-2031'.

ii. Preventing both new and existing development from contributing to or being adversely affected by unacceptable levels of soil, air, light, water or noise pollution or land instability;

…"

3 Methodological Approach

This section sets out the approach taken to assess the potential impact on air quality during the operation of biomass boilers at Scotts of Thrapston.

3.1 Scope of the Assessment

This assessment models NO_2 and PM_{10} emissions from one biomass boiler located at the site. Point source dispersion modelling has been conducted to determine the risk of the impact of associated NO_2 and PM_{10} concentrations with respect to breaching AQO.

The biomass boiler has operated under the RHI scheme and is too small in terms of its thermal input to require regulation under the environmental permitting regime, operated by the Environment Agency. However, in order to provide a robust assessment, and evaluate the air quality effect on nearby receptors, the assessment procedure follows that published by the Environment Agency[18].

3.2 Dispersion Model

Dispersion modelling was undertaken using ADMS-5.2 (v5.2.4.0), which is developed by Cambridge Environmental Research Consultants (CERC) Ltd. ADMS-5 is a PC based dispersion modelling software package that simulates a wide range of buoyant and passive releases to atmosphere from either single or multiple sources. The model utilises hourly meteorological data to define conditions for plume rise, transport and diffusion. It estimates the concentration for each source and receptor combination for each hour of input meteorology and calculates user-selected long-term and short-term averages.

The model typically requires the following input data:

- Locations and dimensions of all sources and nearby structures;
- Output grid and receptor locations;
- Meteorological data;
- Terrain data (if modelling terrain effects);
- Emission rates, emission parameters (e.g. temperature) and emission profiles (e.g. one hour per day) for modelled pollutants; and
- Surface roughness and Monin-Obukhov length.

3.2.1 Modelled Scenarios

The modelled scenario in this assessment comprises the one assessed biomass boiler in continuous operation for 24 hours a day 365 days of the year. This is a conversative scenario as the biomass boiler is proposed to operate for approximately 2500 hours per year. The operational scenario has been considered for 2023.

The model outputs have been set up for the:

[18] https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

- long-term (annual mean) NO_x concentration;
- short-term (1-hour mean) 99.79th %ile NO_x concentration;
- long-term (annual mean) PM_{10} concentration; and
- short-term (24-hour mean) 90.41st %ile PM_{10} concentration.

Further details on the NO_x to NO_2 relationship and conversion rates are in Section 3.2.8.

3.2.2 Site Layout (Building and Structural Effects)

The dispersion of substances released from elevated sources can be influenced by the presence of buildings close to the emission point. Structures that are in excess of one third of the height of the stack can have a significant effect on dispersion by interrupting wind flows and causing significantly higher ground-level concentrations close to the source than would otherwise occur.

The grid references and the size dimensions of all buildings included in the dispersion model are set out below in Table 3.1. The positions of the modelled buildings are illustrated in Figure 3.1.

All the buildings at the site pertinent to the model have pitched roofs; all buildings within the model are flat roofed. Therefore, each modelled building has been modelled with a height deemed representative with respect to the dispersion of pollutants from the biomass boilers.

Table 3.1: Modelled building dimensions

Name	Shape	X (m)	Y (m)	Height (m)	Length (m)	Width (m)	Angle (°)
Biomass Building (main)	Rectangular	499314.9	278734.8	3.95	5.84	10.00	199.18
Scotts 1	Rectangular	499305.7	278702.4	5.31	61.45	18.51	19.63
Scotts 2	Rectangular	499329.2	278712.9	5.31	96.81	18.59	199.69
Buildbase	Rectangular	499281.3	278706.8	5.31	66.57	14.65	199.74
Building005	Rectangular	499310.4	278781.0	5.31	43.50	25.79	199.70
Building 006	Rectangular	499359.2	278795.4	5.31	55.23	32.8	199.42

Figure 3.1: Modelled buildings (Google Earth image date 31/05/2020)

3.2.3 Source and Emission Parameters

Source parameters and emissions data have been supplied by CC Town Planning and Talbott's Biomass Energy Systems Ltd; conservative estimations have been made by DS where data was unavailable. The heat demand for the site will mean that the boilers will run for 2,500 hours of the year i.e. for 29 % of the time. As a very conservative assumption, the model assumes that the boilers will emit 100% of the time; this means that annual mean concentrations will in reality prove to be less than one third of the modelled predictions.

Source geometry is presented below in Table 3.2. The height of emissions release of the stack and the stack internal diameter have been provided by Talbott's. Coordinates for the stack have been taken from georeferenced site plans. All assumptions have been agreed with the client and considered representative.

Table 3.3 presents the exit temperature and velocity for the stack. The exit temperate has been supplied by Talbott's, the exit velocity has been conservatively assumed by DS.

Table 3.4 presents NO_x and PM_{10} emissions data for the stack. Emissions rates have been calculated from emissions certificates supplied to DS. Details of emissions calculation are presented in Appendix A. The emission certificate for the boiler is presented in Appendix B.

The locations of the modelled point sources are illustrated below in Figure 3.2.

Table 3.2: Source geometry

Source	Height (m)	X (m)	Y (m)	Diameter (m)	Main Building
MWE199	8.475	499315.08	278737.68	0.18	Biomass Building (main)

Table 3.3: Source Characteristics

Source	Exit Velocity (m/s)	Temperature (°C)
MWE199	15.0	180

Table 3.4: Emission Data

Pollutant	Emission Rate (g/s)
NO_x	0.0373
PM_{10}	0.0075

Figure 3.2: Modelled point sources (Google Earth image date 31/05/2020)

3.2.4 Meteorological Data

The key meteorological parameters for dispersion modelling are wind speed and wind direction. Meteorological parameters such as cloud cover, surface temperature, precipitation rate and relative humidity are also taken into account.

For dispersion modelling, hourly-resolved data are required and often it is difficult to find a local site that can provide reliable data for all the meteorological parameters at this resolution.

Based upon the above, Bedford is considered to be a representative meteorological monitoring station, located approximately 20 km south of the site.

To account for variation in meteorological conditions, this quantitative assessment and dispersion modelling has been carried out with meteorological data from the period 2017 to 2019. Figure 3.3 below presents the wind rose for each modelled year.

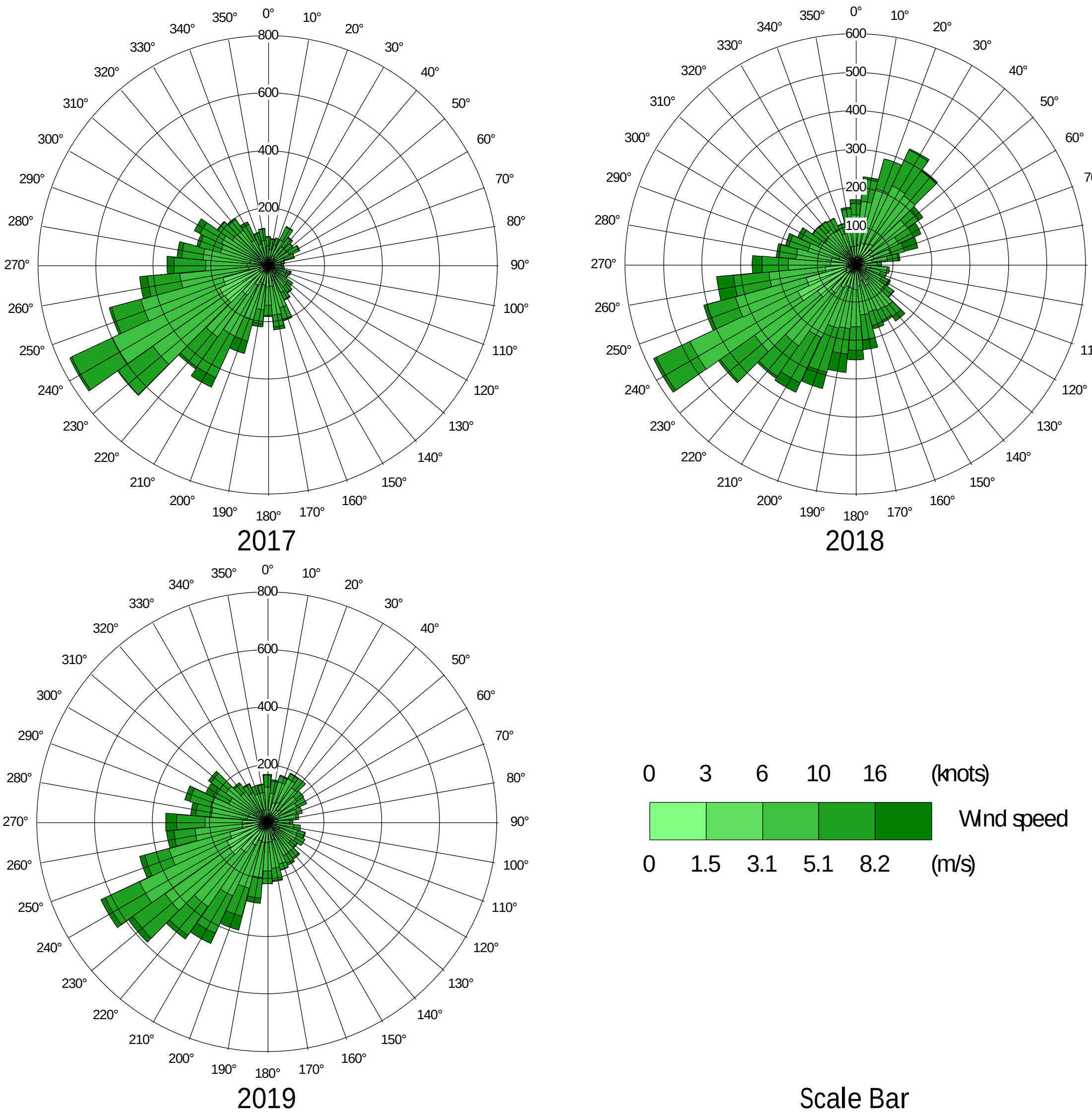

Figure 3.3: Bedford meteorological station Windrose Plots: 2017 - 2019

3.2.5 Topography

The presence of elevated terrain can significantly affect ground level concentrations of pollutants emitted from elevated sources, such as stacks, by reducing the distance between the plume centre line and ground level, increasing turbulence and, hence, plume mixing.

Guidance for the use of the ADMS-5 model suggests that terrain is normally incorporated within a modelling study when the gradient exceeds 1:10. Terrain in the area surrounding is flat and therefore no terrain data has been used in the model.

3.2.6 Surface Roughness

The dispersion site surface roughness length (z0) was set to 0.5 m (Parkland, open suburbia) for the dispersion site and to 0.3 m (Agricultural areas max) for the meteorological site location.

3.2.7 Minimum Monin-Obukhov Length

The Minimum Monin-Obukhov Length (MMOL) provides a measure of the stability of the atmosphere. The model default MMOL value of 10 m was used in the dispersion model to describe the modelling area. An MMOL value of 1 m was used for the meteorological station location. These values are considered representative of the respective surrounding areas.

3.2.8 NO_x to NO_2 Relationship

As discussed in Section 1.4.1, emissions of NO_x will comprise contributions from both NO and NO_2. Typically, air quality assessments are made against the concentrations of NO_2 as it is more toxic than NO. However, combustion flue gases comprise 90-95% NO which, in time, will oxidise in the atmosphere into NO_2.

As NO_2 emissions from the engines are only one constituent of the total NO_x emissions, an allowance of the NO_2 proportion of NO_x needs to be made. The exact proportion of NO_2 in NO_x emissions from the development is unknown.

Empirical estimates have been made by Janssen et al [19], which are based on a comprehensive study of observations within power station plumes. This method, which is considered to be more realistic, suggests that the conversion would be in the order of 10-20% within 1-2km of the release point.

In accordance with guidance provided by the Environment Agency Air Quality Modelling and Assessment Unit[20], it is assumed that 70% of the total NO_x emissions from the plant will be converted into NO_2 over the long-term period, with 35% of the of the total NO_x emissions from the plant will be converted into NO_2 over the short-term period. This is a 'worst case' approach when compared to other research and has been used in this assessment.

[19] L.H.J.M. Janssen, J.H.A. Van Wakeren, H. Van Duuren and A.J. Elshout, A Classification of NO Oxidation Rates in Power Plant Plumes Based on Atmospheric Conditions, Atmospheric Environment Vol. 22, No. 1, pp. 43 – 53. 1988.

[20] Environment Agency: Air Quality Modelling and Assessment Unit, Conversion rates for NO_x and NO_2. http://webarchive.nationalarchives.gov.uk/20140328232919/http:/www.environment-agency.gov.uk/static/documents/Conversion_ratios_for__NOx_and_NO2_.pdf

3.3 Specified Receptors

Residential receptors likely to be most affected have been considered within this assessment in order to carry out a comparison against the AQO. Table 3.5 details the modelled discrete receptors and Figure 3.4 illustrates their locations.

LAQM guidance clarifies where likely exceedances of the objectives should be assessed and states that Review and Assessment should focus on *"locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the relevant air quality objective"* [21]. The receptors most likely to experience the greatest change in pollution concentrations from the proposed development were selected based on professional judgement.

Table 3.5: List of receptors

Receptor ID	X (m)	Y (m)	Z (m)
R1	499285.05	278754.81	4.5
R2	499278.17	278740.71	1.5
R3	499278.17	278740.71	4.5
R4	499288.44	278779.66	1.5
R5	499288.44	278779.66	4.5
R6	499274.15	278718.8	4.5
R7	499267.43	278701.14	4.5
R8	499261.70	278686.02	4.5
R9	499260.09	278780.16	1.5
R10	499260.09	278780.16	4.5
R11	499253.31	278759.40	1.5
R12	499253.31	278759.40	4.5
R13	499253.44	278744.32	1.5
R14	499253.44	278744.32	4.5
R15	499242.99	278726.46	1.5
R16	499242.99	278726.46	4.5

[21] Department for Environment, Food and Rural Affairs (2016), Local Air Quality Management – Technical Guidance (16)

Figure 3.4: Modelled receptors (Google Earth image date 31/05/2020)

3.4 Screening Criteria

The EA risk assessment guidance[22] provides criteria for assessing the significance of emissions with respect to the background air quality and air quality standards.

Stage 1: Criteria for screening out insignificant Process Contributions (PCs)

PCs can be screened out from detailed dispersion modelling if both of the below criteria are met:

PC long-term < 1 % of the long-term air quality standard; and

PC short-term < 10 % of the short-term air quality standard.

If both of these criteria are met, no further assessment of the pollutant in question is required. If one or both of the criteria are not met then further screening criteria are applied, outlined below in stage 2.

Stage 2: Criteria for screening out insignificant Predicted Environmental Concentrations (PECs)

[22] https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

The PEC is the combination of the PC and the background concentration of the pollutant. Detailed dispersion modelling can be screened out if both of the below criteria are met:

PEC long-term < 70 % of the long-term air quality standard; and

PC short-term < 20 % of the short-term air quality standard minus twice the long-term background concentration.

Any emissions which don't meet the screening criteria for stage 2 require further detailed modelling.

Detailed modelling is also required if:

Emissions affect an AQMA; or

Restrictions apply for any substance emitted in this area.

No further action is required if detailed modelling shows the resulting PECs are below the relevant AQO.

3.5 Modelling Assumptions, Uncertainties and Exclusions

In addition to the parameters outlined above, some assumptions have been made for the modelling, including:

The biomass boiler operates for 24 hours a day throughout the year; and

Emission data and source parameters has been obtained from CC Town Planning, Scoots of Thrapston and Talbott's and DS have made conservative assumptions where data hasn't been available.

Uncertainty in dispersion modelling predictions can be associated with a variety of factors, including:

Model limitations;

Data uncertainty due to errors in input data, emission estimates, operational procedures, land use characteristics and meteorology; and

Variability - randomness of measurements used.

Potential uncertainties in the model results were minimised as far as practicable and conservative inputs used in order to provide a robust assessment. This included the following:

Choice of model - ADMS-5 is a widely used atmospheric dispersion model and results have been verified through a number of studies to ensure predictions are as accurate as possible;

Emission rates - Emission rates have been calculated by DS from emissions data supplied;

Receptor locations -Receptors have been modelled in worst-case locations for comparison with AQO;

Variability - Where site specific input parameters were not available, assumptions were made with consideration of the conditions as necessary in order to ensure a robust assessment of potential pollutant concentrations; and

All results presented are the maximum concentrations from a 3-year modelling period, so represent the maximum potential impact.

4 Baseline Conditions

The following section sets out the baseline conditions in relation to air quality at the site. For the purpose of this assessment, data has been obtained from the NNC 2022 Air Quality Annual Status Report (ASR)[23] and the Defra air quality resource website[24].

The 2022 ASR is prepared by NNC in accordance with the requirements of LAQM as set out in Part IV of the Environment Act (1995).

Defra provides background pollution concentration estimates to assist local authorities with undertaking their 'Review and Assessment' work. This data is available to download from the Defra air quality resource website for NO_x, NO_2, PM_{10} and $PM_{2.5}$ for every 1 km X 1 km grid square for all local authorities. The current dataset is based on 2018 background data and the future year projections are available for 2018 to 2030.

4.1 Air Quality Management Areas (AQMAs)

NNC has not declared any AQMAs.

4.2 NO_2

NNC did not undertake any automatic monitoring of NO_x or NO_2 within their jurisdiction in 2021. For the same year, NNC monitored NO_2 passively using diffusion tubes at 100 sites.

Within Thrapston there are five diffusion tube monitoring sites, the closest of these being ENC2 located along Bridge Street in a roadside location, approximately 190 m southwest of the proposed biomass boiler.

Background annual mean NO_2 concentrations at the assessment site have been informed by NO_2 concentrations from the latest Defra background map. The maximum 2023 Defra background NO_2 annual mean concentrations for the modelled extent is 10.37 µg/m^3, comfortably below the relevant AQO. This is considered an appropriate background for the site.

4.3 PM_{10}

NNC did not undertake any automatic monitoring of PM_{10} during 2021. Background PM_{10} concentrations have therefore been taken from 2023 Defra background mapping which is deemed representative of background concentrations for the modelled area. The maximum 2023 PM_{10} annual mean concentration for the modelled extent is 13.62 µg/m^3.

4.4 Baseline Summary

A summary of the annual mean and short-term mean background concentrations used for the purpose of this assessment are presented below in Table 4.1.

[23] North Northamptonshire Council. (2022), '2022 Air Quality Annual Status Report (ASR)'.
[24] Department for Environmental Food and Rural Affairs. Accessible at: https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018

Table 4.1: Backgrounds assigned to modelled grid receptors

Pollutant	Averaging Period	Background Concentration (µg/m^3)
NO_2	Annual mean	10.37
	1-hour mean	20.74
PM_{10}	Annual mean	13.62
	24-hour mean	16.08

a. Annual mean *2
b. Annual mean *2*0.59

5 Results

5.1 Operational Phase

As discussed in Section 3.1, there are potential impacts on local air quality that could arise from the operation of the proposed biomass boiler. The potential impact of air quality on human health is discussed below.

The impact on air quality from the assessed biomass boiler for all modelled pollutants and averaging periods is detailed in the below tables.

Table 5.1 and Table 5.3 present the maximum PC and PEC at specified receptors (detailed in section 3.3) for NO_2 and PM_{10} respectively, as well as comparison against the relevant AQS.

Table 5.2 and Table 5.4 compare the concentrations of NO_2 and PM_{10} at modelled receptors against EA scoping criteria (detailed in section 3.4).

Table 5.1: Maximum NO_2 Process Contributions and Predicted Environmental Contributions at Specified Receptors

Pollutant	Averaging Period	AQS (μg/m³)	Max PC (μg/m³)	Max PC (% AQS)	Max PEC (μg/m³)	Max PEC (% AQS)
R1	1-hour mean	200	5.9	3.0	26.7	5.9
	Annual mean	40	0.6	1.5	11.0	0.6
R2	1-hour mean	200	4.5	2.3	25.3	4.5
	Annual mean	40	0.4	1.1	10.8	0.4
R3	1-hour mean	200	5.5	2.7	26.2	5.5
	Annual mean	40	0.5	1.2	10.8	0.5
R4	1-hour mean	200	4.4	2.2	25.2	4.4
	Annual mean	40	0.5	1.2	10.8	0.5
R5	1-hour mean	200	5.0	2.5	25.7	5.0
	Annual mean	40	0.6	1.4	10.9	0.6
R6	1-hour mean	200	4.3	2.2	25.1	4.3
	Annual mean	40	0.5	1.4	10.9	0.5
R7	1-hour mean	200	3.6	1.8	24.3	3.6
	Annual mean	40	0.6	1.4	10.9	0.6
R8	1-hour mean	200	3.1	1.5	23.8	3.1
	Annual mean	40	0.5	1.3	10.9	0.5
R9	1-hour mean	200	3.3	1.7	24.0	3.3

Pollutant	Averaging Period	AQS (µg/m^3)	Max PC (µg/m^3)	Max PC (% AQS)	Max PEC (µg/m^3)	Max PEC (% AQS)
	Annual mean	40	0.3	0.8	10.7	0.3
R10	1-hour mean	200	3.6	1.8	24.4	3.6
	Annual mean	40	0.4	0.9	10.7	0.4
R11	1-hour mean	200	3.3	1.6	24.0	3.3
	Annual mean	40	0.3	0.8	10.7	0.3
R12	1-hour mean	200	3.8	1.9	24.5	3.8
	Annual mean	40	0.4	0.9	10.7	0.4
R13	1-hour mean	200	3.4	1.7	24.1	3.4
	Annual mean	40	0.3	0.7	10.7	0.3
R14	1-hour mean	200	3.8	1.9	24.5	3.8
	Annual mean	40	0.3	0.8	10.7	0.3
R15	1-hour mean	200	6.3	3.2	27.0	6.3
	Annual mean	40	0.3	0.8	10.7	0.3
R16	1-hour mean	200	3.9	2.0	24.7	3.9
	Annual mean	40	0.3	0.7	10.7	0.3

Table 5.2: Assessment of NO_2 concentration at receptors against EA screening criteria

Pollutant	Averaging Period	Scoped out at Stage 1?	Scoped out at Stage 2?	Further Assessment required?
R1	1-hour mean	Yes	-	No
	Annual mean	No	Yes	No
R2	1-hour mean	Yes	-	No
	Annual mean	No	Yes	No
R3	1-hour mean	Yes	-	No
	Annual mean	No	Yes	No
R4	1-hour mean	Yes	-	No
	Annual mean	No	Yes	No
R5	1-hour mean	Yes	-	No
	Annual mean	No	Yes	No
R6	1-hour mean	Yes	-	No
	Annual mean	No	Yes	No
R7	1-hour mean	Yes	-	No

Pollutant	Averaging Period	Scoped out at Stage 1?	Scoped out at Stage 2?	Further Assessment required?
	Annual mean	No	Yes	No
R8	1-hour mean	Yes	-	No
	Annual mean	No	Yes	No
R9	1-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R10	1-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R11	1-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R12	1-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R13	1-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R14	1-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R15	1-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R16	1-hour mean	Yes	-	No
	Annual mean	Yes	-	No

Table 5.3: Maximum PM_{10} Process Contributions and Predicted Environmental Contributions at Specified Receptors

Pollutant	Averaging Period	AQS (µg/m^3)	Max PC (µg/m^3)	Max PC (% AQS)	Max PEC (µg/m^3)	Max PEC (% AQS)
R1	24-hour mean	50	0.2	0.1	16.3	8.1
	Annual mean	40	0.2	0.1	13.8	6.9
R2	24-hour mean	50	0.2	0.1	16.2	8.1
	Annual mean	40	0.1	0.1	13.7	6.9
R3	24-hour mean	50	0.1	0.1	16.2	8.1
	Annual mean	40	0.1	0.1	13.8	6.9
R4	24-hour mean	50	0.4	0.2	16.5	8.3
	Annual mean	40	0.1	0.1	13.8	6.9

Pollutant	Averaging Period	AQS (µg/m³)	Max PC (µg/m³)	Max PC (% AQS)	Max PEC (µg/m³)	Max PEC (% AQS)
R5	24-hour mean	50	0.6	0.3	16.6	8.3
	Annual mean	40	0.2	0.1	13.8	6.9
R6	24-hour mean	50	0.6	0.3	16.7	8.3
	Annual mean	40	0.2	0.1	13.8	6.9
R7	24-hour mean	50	0.8	0.4	16.9	8.4
	Annual mean	40	0.2	0.1	13.8	6.9
R8	24-hour mean	50	0.8	0.4	16.8	8.4
	Annual mean	40	0.2	0.1	13.8	6.9
R9	24-hour mean	50	0.1	0.1	16.2	8.1
	Annual mean	40	0.1	0.0	13.7	6.9
R10	24-hour mean	50	0.2	0.1	16.3	8.1
	Annual mean	40	0.1	0.1	13.7	6.9
R11	24-hour mean	50	0.1	0.1	16.2	8.1
	Annual mean	40	0.1	0.0	13.7	6.9
R12	24-hour mean	50	0.1	0.1	16.2	8.1
	Annual mean	40	0.1	0.1	13.7	6.9
R13	24-hour mean	50	0.1	0.0	16.2	8.1
	Annual mean	40	0.1	0.0	13.7	6.9
R14	24-hour mean	50	0.1	0.1	16.2	8.1
	Annual mean	40	0.1	0.0	13.7	6.9
R15	24-hour mean	50	0.1	0.0	16.2	8.1
	Annual mean	40	0.1	0.0	13.7	6.9
R16	24-hour mean	50	0.1	0.1	16.2	8.1
	Annual mean	40	0.1	0.0	13.7	6.9

Table 5.4: Assessment of PM_{10} concentration at receptors against EA screening criteria

Pollutant	Averaging Period	Scoped out at Stage 1?	Scoped out at Stage 2?	Further Assessment required?
R1	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R2	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No

Pollutant	Averaging Period	Scoped out at Stage 1?	Scoped out at Stage 2?	Further Assessment required?
R3	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R4	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R5	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R6	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R7	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R8	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R9	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R10	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R11	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R12	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R13	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R14	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R15	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No
R16	24-hour mean	Yes	-	No
	Annual mean	Yes	-	No

From the above tables, the PEC for NO_2 and PM_{10} for all modelled receptors is well below the AQO. This is a based on a very conservative assessment which assumes the boilers run continuously.

Upon application of the first EA screening step, PM_{10} is screened out for all receptors and averaging periods. NO_2 is screened out for the 1-hour mean, but not for the annual mean.

Upon application of the second EA screening criteria, all pollutants are comfortably screened out and no further assessment is required.

Therefore, it can be said that there are no significant adverse impacts on air quality with respect to all pollutants at modelled human health receptors.

6 Conclusion

This report provides an assessment of the impacts associated with the proposed development of a biomass boiler at Scotts of Thrapston, Bridge Street, Thrapston NN14 4LR.

This report has assessed:

- The risk of the impacts from the operation of the biomass boiler on meeting the national air quality objectives.

An air quality assessment of the operational air quality effects has been undertaken for the proposed biomass boiler at Scotts of Thrapston.

Modelling has been undertaken using data provided by CC Town Planning, Scoots of Thrapston and Talbott's Biomass Energy Systems Ltd, along with conservative assumptions by DS where data has not been available.

The results of the dispersion modelling show that for all residential receptors and locations where the relevant air quality objectives are applicable, no exceedances are expected to result from the operation of the assessed biomass boilers.

It can therefore be concluded that the risk of the emissions from the proposed biomass boiler at Scotts of Thrapston breaching air quality objectives at locations relevant in the legislation is very low.

The proposed development is therefore consistent with local and national planning policy.

Appendix A: Calculation of Emissions

NO_x and PM emissions were calculated based upon data provided within the emissions certificate for the biomass boiler and conservative assumptions by DS. Inputs to the calculations are presented below in Table A.1. The calculation of emissions is detailed below in Table A.2.

Table A.1: Calculation inputs

Thermal output	199 kW
Assumed heat output	277.78 kWh
Assumed thermal efficiency	80 %
NO_x emissions (from certificate)	150 g/GJ
PM emissions (from certificate)	30 g/GJ

Table A.2: Emissions calculations

Heat energy output per hour	Thermal output / Assumed heat output 199 / 277.78 = 0.71639427 GJ
Fuel Consumption	Heat energy output per hour / assumed thermal efficiency 0.71639427 / 0.8 = 0.895492836 GJ/h
NO_x emissions for model	NO_x emission (from certificate) x fuel consumption 150 x 0.895492836 = 134.3239 g/h = **0.037312 g/s**
PM emissions for model	PM emission (from certificate) x fuel consumption 30 x 0.895492836 = 26.86479 g/h = **0.007462 g/s**

Appendix B: Emissions Certificate

Non-Domestic Renewable Heat Incentive

www.ofgem.gov.uk/ndrhi

22 JUN 2018

Emissions Certificate

In order to accredit any biomass boiler or stove applications received for the domestic or non-domestic Renewable Heat Incentive (RHI) schemes, Ofgem must be satisfied that a valid emissions certificate exists for the specific model in the application (or alternatively for the non-domestic RHI, an environmental permit for the site). This template incorporates all information required to demonstrate that the tested plant meets the air quality requirements of the RHI. It must be fully completed and issued by a testing laboratory in order to be a valid certificate.

1. TEST HOUSE	
a) Name and address of the testing laboratory that has carried out the required tests and issued this certificate * **if different, include details of both*	**Environmental Compliance Limited** Unit G1, Main Avenue Treforest Industrial Estate Pontypridd, CF37 5BF
b) Name and signature of the person authorised by the testing laboratory to issue the certificate	Name: **Andy Barnes** Signature [redacted]
c) Date of issue of this certificate, together with certificate reference number for this certificate **Please see Note A*	Date: **23/11/2020** Certificate reference number: **P3617/C005(B)** *Optional:* reference number of original test report on which this certificate is based: **P3617 R001**
d) If the testing laboratory that has carried out the required tests is accredited to BS EN ISO/IEC 17025:2005, date of accreditation and accreditation number *(if testing conducted on or after 24 September 2013, the testing laboratory **must be** BS EN ISO/IEC 17025:2005 accredited at the time of testing)*	Initial Registration: United Kingdom Accreditation Service since: **16 July 2004** Current Certificate: **30 March 2020** Accreditation number: **2499**

2. PLANT - Please see Note B	
a) Name of the plant tested	Talbotts Biomass Energy Systems Ltd.
b) Model of the plant tested* *Please ensure this is the same as in the manufacturer's documentation and boiler nameplate	Talbotts MWE 199 (Serial Number MWE 019)
c) Manufacturer of the plant tested	Talbotts Biomass Energy Systems Ltd.
d) Installation capacity* of the tested plant in kilowatts (kW) *The total installed peak heat output capacity	199 kW
e) Is the plant a manually stoked, natural draught plant? (without a fan providing forced or induced draught)	NO
f) (i) Date the plant was tested* (ii) Please confirm that NOx and PM have been tested on the same occasion *This is in reference to the emissions testing for PM and NOx, not any wider range of tests. A specific date is required. Please provide the date of test performed at ≥85% of the installation capacity. If more than one model has been tested or testing has been conducted on different dates for different fuels, please list each date with details.	29/06/2018 YES
g) Please list all the plants in the type-testing range* of the tested plants to which the certificate applies, if any.[1] Please include the installation capacity of each model. *This must follow the ratio rules: If the smallest plant in the range is 500kW or less, the largest plant in the range can't be more than double the smallest. If the smallest plant in the range is over 500kW, the largest plant in the range can't be more than 500kW greater than the smallest.	MWE 199

[1] The type-testing approach enables testing laboratories to provide assurance that all boilers in a given range meet the air quality requirements, without needing to specifically test each boiler.

3. FUELS	
a) Types of fuels used when testing (Where relevant, the fuel should be classified according to EN303-5, referencing the relevant EN14961 standard for specific classification (superseded by EN17225). We don't expect broader categories such as 'beech'.	*Wood Chips EN ISO 17225-4, Class B1* *Wood Chips EN ISO 17225-4, Class B2 including Melamine Faced Chipboard (by products and residues from wood processing)* *Sawdust according to EN ISO 17225-1 (Table 1) 1.2.1, Table 7 (M25), A3, 4.4kW/kg (Chemically untreated wood by products and residues).*
b) Based on the testing, list the range of fuels that can be used in compliance with the emission limits of 30 grams per gigajoule (g/GJ) net heat input for particulate matter (PM), and 150 g/GJ net heat input for oxides of nitrogen (NOx) (Where relevant, the fuel should be classified according to EN303-5, referencing the relevant EN14961 standard for specific classification (superseded by EN17225). We don't expect broader categories such as 'beech'.	*Wood Chips according to EN ISO 17225-4, Class B2, M35, (By products and residues from wood processing) including chipped wood waste, MFC, MDF, Chipboard, Softwood, Particleboard, OSB, Plywood and Hardwood.* *Sawdust according to EN ISO 17225-1, (Table 1) 1.2.1, Table 7 (M20), A3 4.4kW/kg (Chemically untreated wood by products and residues)* *Wood Chips according to EN ISO 17225-4, Class B1, M35.*
c) Moisture content of the fuel used during testing. (If multiple fuel types have been tested state all.)	*Sawdust – 21%* *Wood Chips Class B2 (MFC) – 21%* *Wood Chips Class B1 – 21%*
d) Maximum allowable moisture content* of fuel that can be used with the certified plant(s) that ensures RHI emission limits are not exceeded. *This value may be obtained from ranges specified in relevant EN14961 standard for specific fuel classifications or EN303-5 when not applicable. Different fuel types should state different maximum allowable moisture contents.	*Sawdust – 20%* *Wood Chips Class B2 (MFC) – 35%* *Wood Chips Class B1 – 35%*

4. TESTS	
Confirm which requirements the emissions of NOx and PM have been tested in accordance with. Either 4a or 4b must be confirmed to be a valid RHI certificate.	
a) Was the testing carried out in accordance* with all of the provisions relevant to emissions of PM and NOx in either BS EN 303-5:1999 or BS EN 303-5:2012?[2] *It is not a requirement that the tested plant must be within the scope of one of these standards, as long as the test lab can confirm that all of the relevant provisions were followed appropriately	n/a – (see 4b)
b) Was the testing carried out in accordance with all of the following requirements? (i) - EN 14792:2005 in respect of NOx emissions - EN 13284-1:2002 or ISO 9096:2003 in respect of PM emissions[3] (ii) emissions of PM represent the average of at least three measurements of emissions of PM, each of at least 30 minutes duration (iii) the value for NOx emissions is derived from the average of measurements made throughout the PM emission tests.	Yes Yes Yes
c) Please confirm the plant was tested at ≥85% of the installation capacity of the plant.	Yes
d) Please confirm the test shows that emissions from the plant were no greater than 30 g/GJ PM and 150 g/GJ NOx.	Yes
e) Measured* emissions of PM in g/GJ net heat input *This average value should be from the test confirmed in 4c Results from partial load tests are not required. This value must be in the specified units.	25.72
f) Measured* emissions of NOx in g/GJ net heat input *This average value should be from the test confirmed confirmed in 4c. Results from partial load tests are not required. This value must be in the specified units.	131.31

[2] BS EN303-5:1999 and 2012 explain what should be measured and when.
[3] These standards explain how to make the PM and NOx measurements.

Note A: If details from a previously issued certificate or an original test report are being transferred to this RHI emission certificate template, please note that this document must be issued by the testing laboratory as a separate certificate. The issue date and certificate reference number should be in relation to this certificate produced using the RHI template, not the issue date and reference number of the original certificate or test report.

Note B: If you are including multiple tested plants on one certificate, please ensure that all sections are completed for each tested plant, and are laid out such that it is clear which details relate to which tested plant. If a type-testing range is included as well, please show clearly which type-testing range relates to which tested plant(s), following the type-testing range ratio rules outlined in 2g.