Application for a Part B permit

Environmental Permitting (England and Wales) Regulations 2016

Introduction

When to use this form
If you are sending an application to a Local Authority under The Environmental Permitting (England and Wales) Regulations 2016 and the installation requires an air pollution control permit (known as "Part B" installations).

Before you fill in this form
Do please read relevant parts of the Defra general guidance manual. Chapter 4 is about making an application, Chapter 7 is about how permits are decided, and Chapter 12 gives the meaning of Best Available Techniques (BAT). Other chapters introduce the Regulations and give information about various issues.

You also need to read the relevant process guidance note to see what standards and requirements are likely to be expected of your installation.

Pre-application discussions
It is usually sensible to talk to one of our pollution control officers before you complete and submit the application. Contact [ ]

Which parts of the form to fill in
Please fill in as much of it as possible and enclose the appropriate fee. Then send it to:

Causeway House
Bocking End
CM7 9HB

Other documents you may need to submit
You will need to send us various other documents. The application form tells you which ones. It will be simplest for all concerned if you give a reference number for each document and record it on both this form and on the document itself. Please use any existing documents where you can and they are suitable.

Using continuation sheets
Feel free to use a continuation sheet, but you need to clearly identify where you have done so.

Copies - *not relevant for e-applications*
If you are submitting a paper application, please send the original and [ ] copies of the form and all other supporting material, for consultation purposes.

LAPPC application form: to be completed by the operator		
For Local Authority use		
Application reference	Officer reference	Date received

A The basics

A1 Name and address of the installation

FOREST CONTRACTS LTD.
CM8 3TH
3 Stepfield, Freebournes Industrial Estate, Witham, Essex, CM8 3TH

Postcode CM8 3TH Telephone 01245231360

A2 Details of any existing environmental permit or consent *(for waste operations, please include planning permission for the site, including established use certificates, a certificate of lawful existing use, or why the General Permitted Development Order)*

Reference no.	Issuing regulator	Type of permit
B/5/1/01	Uttlesford District Council	Timber & Waste Wood Incineration

A3 Operator details (*The 'operator' = the person who it is proposed will have control over the installation in accordance with the permit (if granted).)*

Name MR OLIVER BULLOCK

Trading name, if different FOREST CONTRACTS LTD.

Registered office address Maiden's Industrial Unit, High Easter, Chelmsford, CM3 1HU Principal office address, if different
Company registration number 03412721

A4 Any holding company?

Is the operator a subsidiary of a holding company within the meaning of section 1159 of the Companies Act 2006? If "yes" please fill in details of the ultimate holding company.

No [X] Yes [ ]

Name NOT APPLICABLE Trading name, if different NOT APPLICABLE
Registered office address NOT APPLICABLE Principal office address, if different NOT APPLICABLE
Company registration number NOT APPLICABLE

A5 Who can we contact about your application?

Name + position MR OLIVER BULLOCK – MANAGING DIRECTOR Tel 01245 231360 Email oliver@forestcontracts.co.uk

B The installation

What activities are or will be carried on at the installation? Please include "directly associated activities" – this term is explained in Annex III in Part B of the general guidance manual

Main activities	Section in Schedule 1 to the EP Regulations
WOOD MANUFACTURING PROCESS TIMBER	Chapter 6 Section 6.6 Part B (a)(ii)

Directly-associated activities (including waste operations)	Schedule 1 references (if any)
WOOD WASTE INCINERATION 50KG/HR OR MORE	Chapter 5 Section 5.1 Part B (a)(v)
WOOD COATING <5 TONNE VOC IN ANY 12 MONTH PERIOD	Chapter 6, Section 6.4 Part B (a)(iv)

B2 Why is the application being made?

[X] new installation

[ ] change to existing installation means it now needs a permit

B3 Site maps

Please provide:-

- A location map showing with a red line round the boundary of the installation Doc reference FCL-001-2026 LOCATION_PLAN
- A site plan or plans showing where all the relevant activities are on site, including storage areas, emission/discharge points, and any directly associated waste operations
  Doc reference FCL-002-2026 MACHINERY LAYOUT

C The details

C1 How will the installation operate?

Doc reference: APPENDIX FCL-003-2026

C2 Emissions, techniques and monitoring?

What pollutants (including odour) and how much are expected to be emitted into the atmosphere? Please say which stage of the process each emission will come from and also whether from a particular chimney, vent or other source (fugitive). Please include emissions during starting and shutting down the plant, and from possible breakdowns or accidents identified by a risk assessment. (*Using process flow diagrams may help to simplify this.*)

What techniques will be used to minimise each emission in line with BAT? What monitoring has been undertaken (give results) and what monitoring is proposed?

Doc Reference: FCL-004-2026 / FCL-005-2026 / FCL-006-2026

C3 Environmental management?

What environmental management procedures and policy will you deploy?

Doc Reference: FCL-007-2026

C4 Impact on the environment?

a) what are the potential significant local environmental effects (including nuisance) of the foreseeable emissions?

b) are there any sites of special scientific interest (SSSIs) or European protected sites nearer than any of the following distances to the proposed installation:

- 2km - where the installation includes Part B combustion, incineration (not cremation), iron and steel, or non-ferrous metal activities
- 1km - where the installation involves mineral or cement and lime activities
- ½ km - in all other cases?

No [X] Yes [ ]

c) if "yes", is the installation likely to have a significant effect on these sites and, if so, what are the implications for the purposes of the Conservation (Natural Habitats etc) Regulations 1994 (see appendix 2 of Annex XVII of the general guidance manual)

d) has an environmental impact assessment been carried out for the installation under planning legislation or for any other purpose. If so, please provide a copy

Doc Reference: FCL-008-2026

D Anything else?

Please tell us anything else you would like us to take account of.

Doc Reference FCL-009-2026/ FCL-010-2026 / ETC_RHI_009v9_RANHEAT_NIMLOCK R1-9.4.22-Forest Contracts, High Easter-2321759-MPC

E Application fee

You must enclose the relevant fee with your application. If your application is successful you will also have to pay an annual subsistence charge, so please say who you want invoices to be sent to.

Forest Contracts Ltd
3 Stepfield, Freebournes Industrial Estate, Witham, Essex, CM8 3TH

Marked for the attention of Oliver Bullock

Postcode: CM8 3TH Telephone: 01245 231360

F Protection of information

G1 Any confidential or national security info in your application?

If there is any information in your application you think should be kept off the public register for confidentiality or national security reasons, please say what and why. General guidance manual chapter 8 advises on what may be excluded. (*Don't include any national security information in your application. Send it, plus the omitted information, to the Secretary of State or Welsh Ministers who will decide what, if anything, can be made public.)*

Doc Reference _____

G2 Please note: data protection

The information you give will be used by the Council to process your application. It will be placed on the relevant public register and used to monitor compliance with the permit conditions. We may also use and or disclose any of the information you give us in order to:

- consult with the public, public bodies and other organisations,
- carry out statistical analysis, research and development on environmental issues,
- provide public register information to enquirers,
- make sure you keep to the conditions of your permit and deal with any matters relating to your permit
- investigate possible breaches of environmental law and take any resulting action,
- prevent breaches of environmental law,
- offer you documents or services relating to environmental matters,
- respond to requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004 (if the Data Protection Act allows)
- assess customer service satisfaction and improve our service.

We may pass on the information to agents/representatives who we ask to do any of these things on our behalf.

G3 Please note: it is an offence to provide false etc information

It is an offence under regulation 38 of the EP Regulations, for the purpose of obtaining a permit (for yourself or anyone else), to:

- make a false statement which you know to be false or misleading in a material particular,
- recklessly make a statement which is false or misleading in a material particular
- intentionally to make a false entry in any record required to be kept under any environmental permit condition
- with intent to deceive, to forge or use a document issued or required for any purpose under any environmental permit condition.

If you make a false statement

- we may prosecute you, and
- if you are convicted, you are liable to a fine or imprisonment (or both).

H Declarations A and B for signing, please

These declarations should be signed by the person listed in answer to question A3. Where more than one person is identified as the operator, all should sign. Where a company or other body corporate is the operator, an authorised person should sign and provide evidence of authority from the board.

Declaration A: I/We certify

No offences have been committed in the previous five years which are relevant to my/our competence to operate this installation in accordance with the EP Regulations.

Signature [redacted] Name OLIVER BULLOCK

Position MANAGING DIRECTOR Date 07/04/2026

Declaration B: I/We certify that the information in this application is correct. I/We apply for a permit in respect of the particulars described in this application (including the listed supporting documentation) I/we have supplied. *(Please note that each individual operator must sign the declaration themselves, even if an agent is acting on their behalf.)*

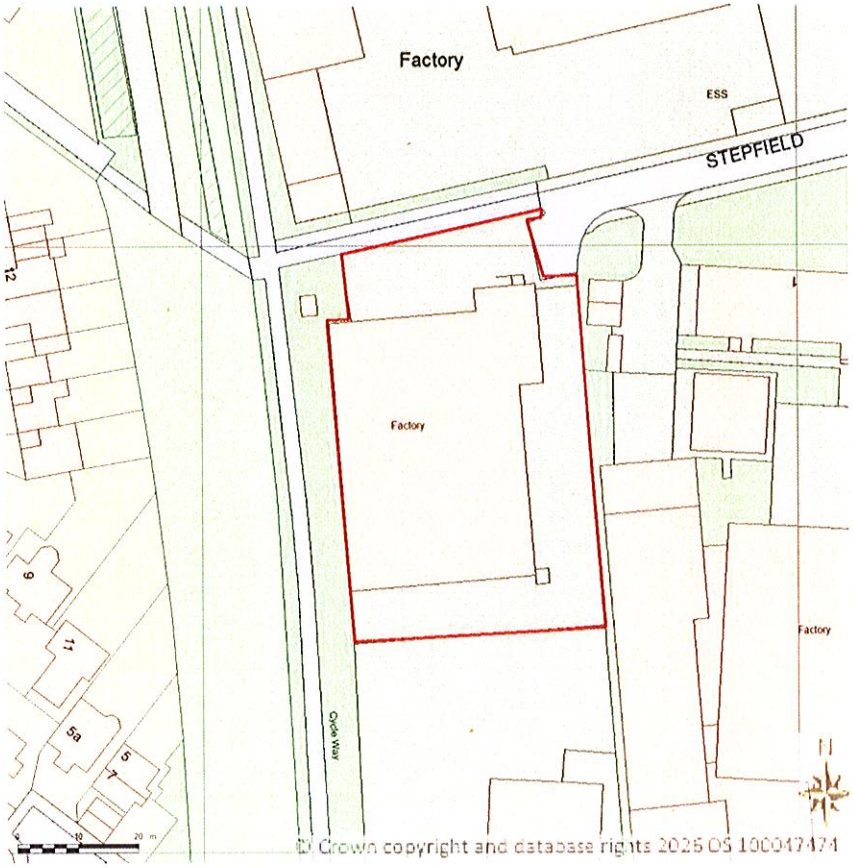
Signature [redacted] Name OLIVER BULLOCK

Position MANAGING DIRECTOR Date 07/04/2026

Signature _____ Name _____

Position _____ Date _____

SITE LOCATION PLAN
AREA 2 HA
SCALE 1:1250 on A4
CENTRE COORDINATES: 582638, 214769



Supplied by Streetwise Maps Ltd
www.streetwise.net
Licence No: 100047474
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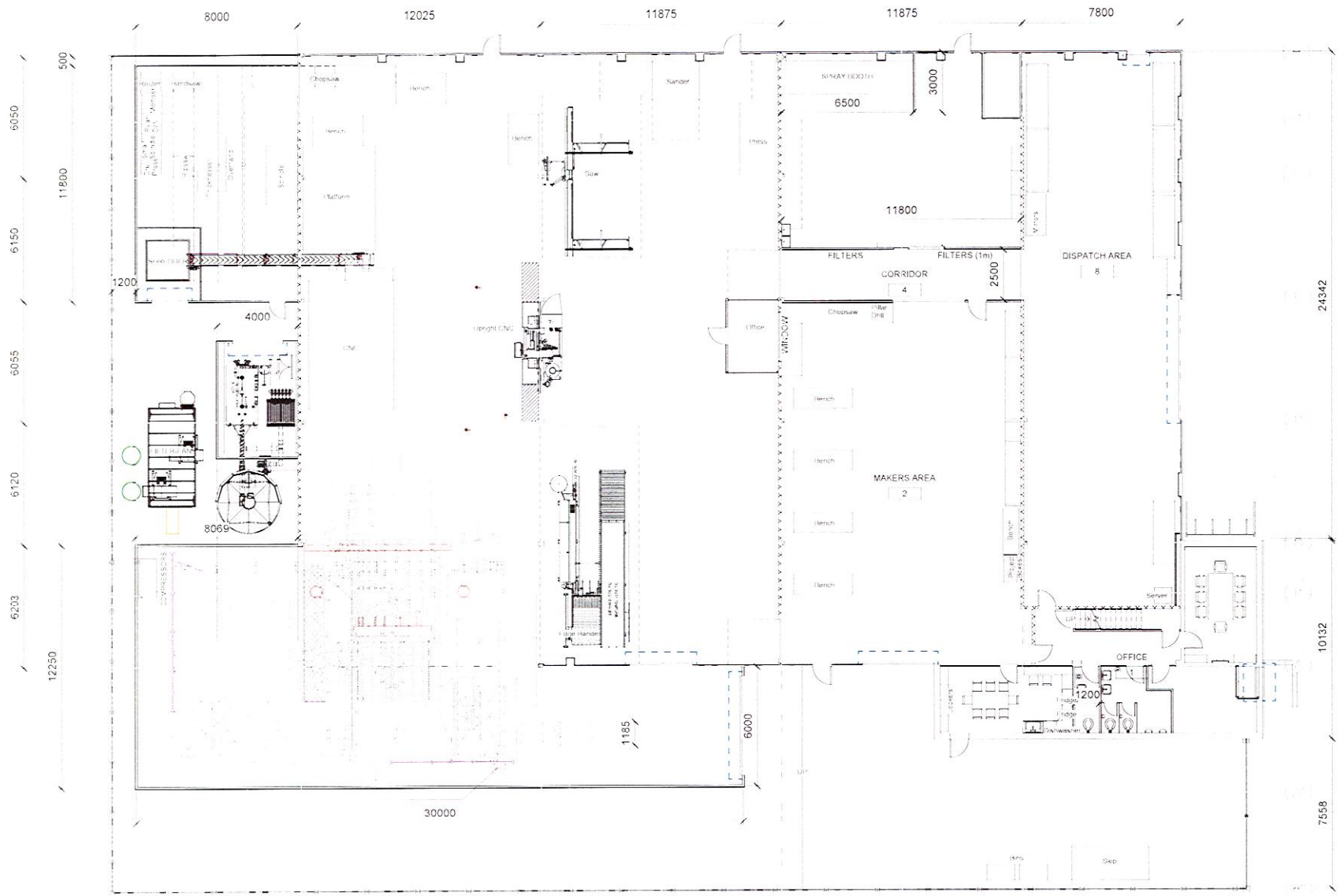


1 Machinery Layout
1 : 100

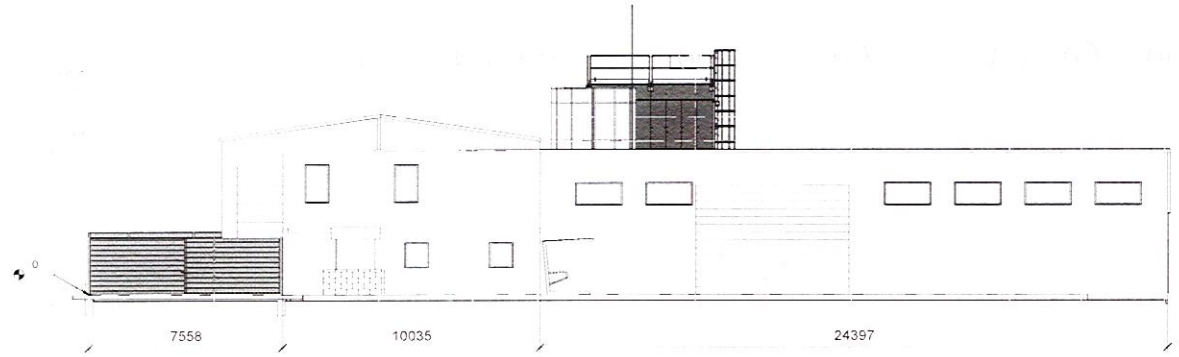
No.	Description	Date
C	Building Update	12/02/2026
D	Biomass System Updated Location	24/02/2026
E	Machinery Layout updated to include EdgeBander	27/02/2026
F	Machinery Layout Updated	09/03/2026
G	Machinery, LEV & Biomass System Layout Updated	19/03/2026

Oliver Bullock

3 Stepfield, Freebournes Industrial Estate, Witham, Essex, CM8 3TH

Machinery Layout

Project number	9996
Date	19/03/2026
Drawn by	PM
Checked by	KB
	9996-GA-006
Scale	1 : 100



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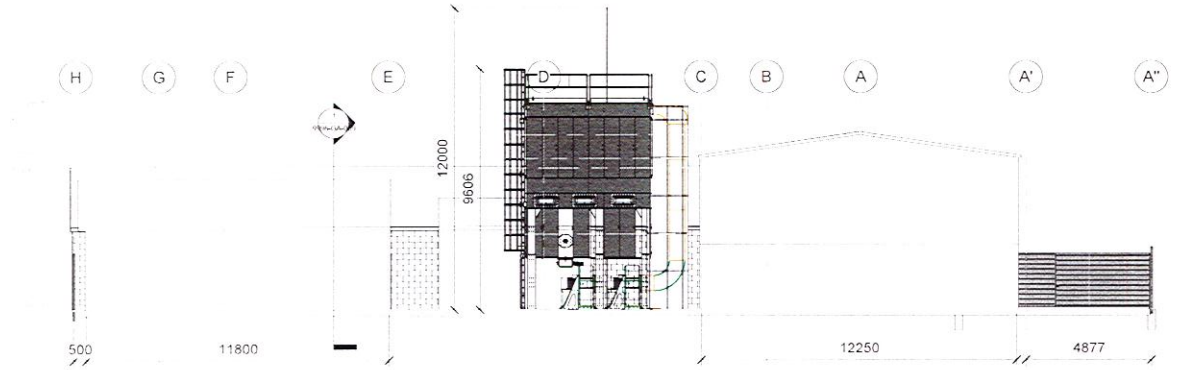
1 : 100



2 Back Elevation
1 : 100

No.	Description	Date
A		24/01/2026
B	Building Update	26/01/2026
C	Building Update	12/02/2026
D	Biomass System Updated Location	24/02/2026
E	Machinery, LEV & Biomass System Layout Updated	19/03/2026

Oliver Bullock

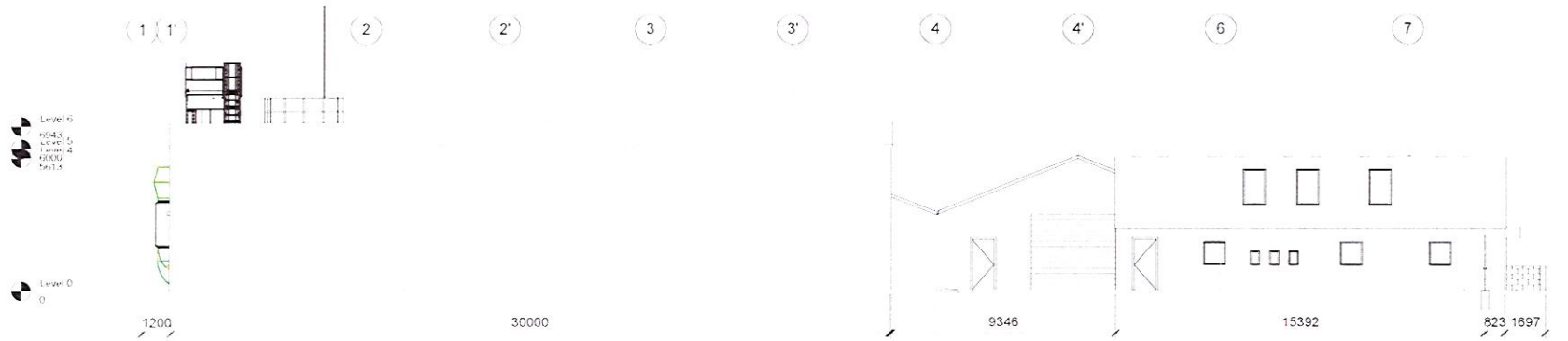
3 Stepfield, Freebournes Industrial Estate, Witham, Essex, CM8 3TH

Elevations

Project number	9996
Date	19/03/2026
Drawn by	PM
Checked by	KB

9996-GA-003

Scale 1 : 100



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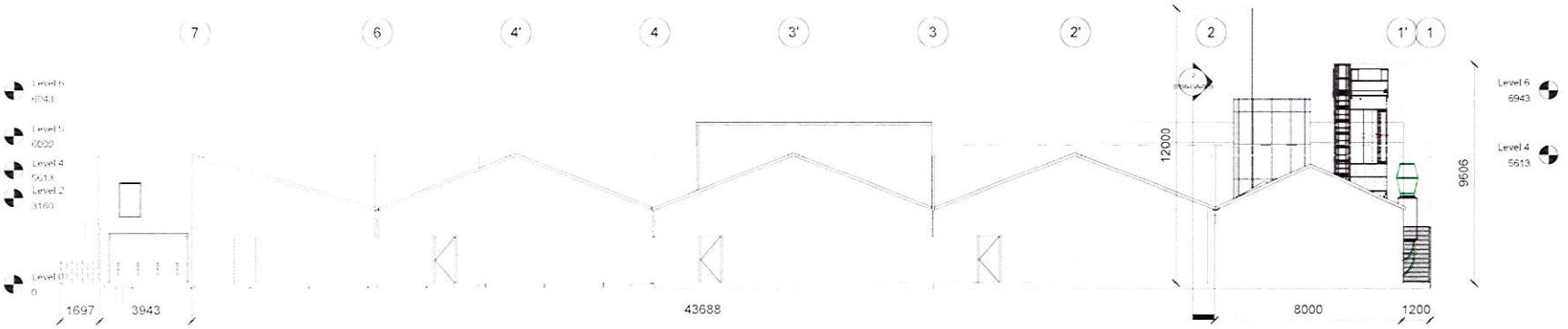


2 Left Elevation
1 : 100

No.	Description	Date
A		24/01/2026
B	Building Update	26/01/2026
C	Building Update	12/02/2026
D	Biomass System Updated Location	24/02/2026
E	Machinery, LEV & Biomass System Layout Updated	19/03/2026

Oliver Bullock

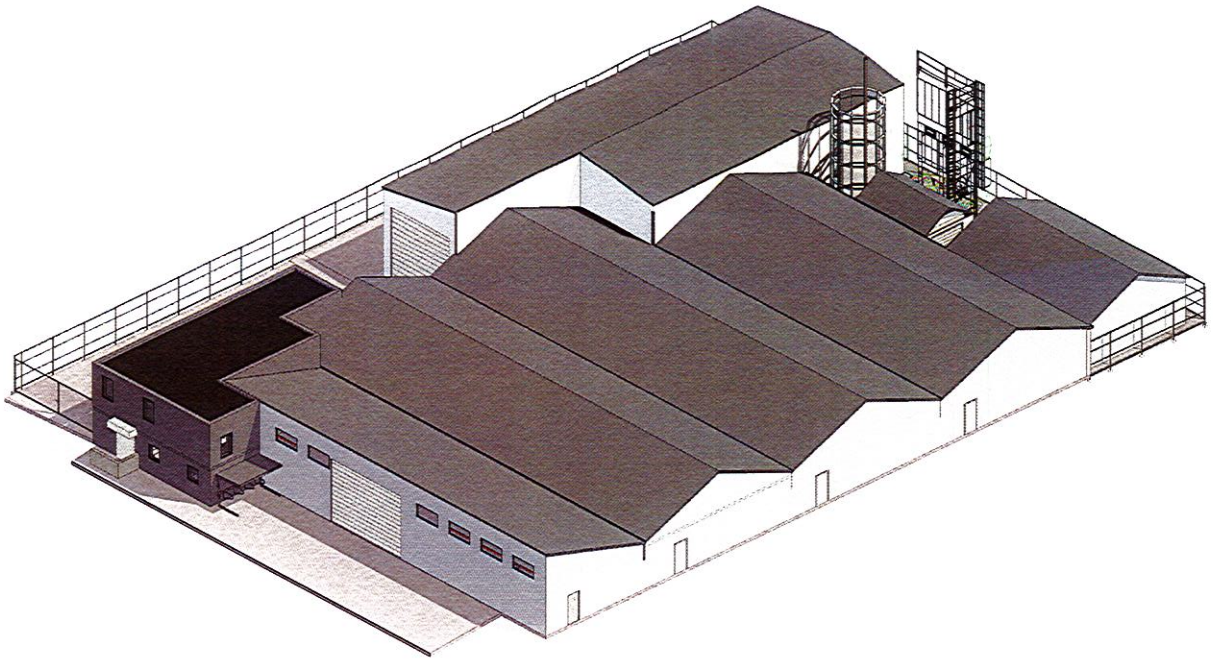
3 Stepfield, Freebournes Industrial Estate, Witham, Essex, CM8 3TH

Side Elevations

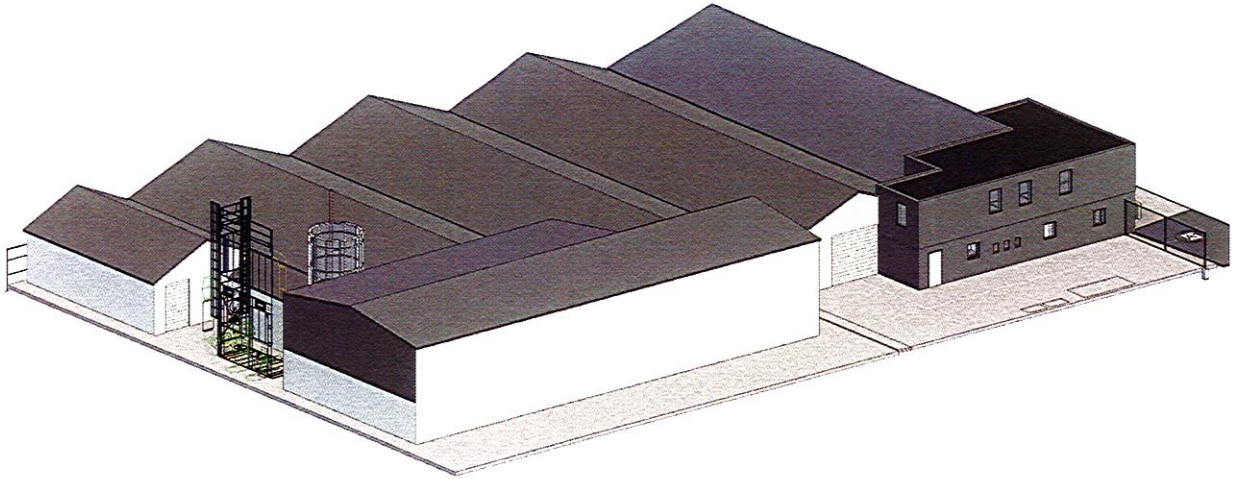
Project number	9996
Date	19/03/2026
Drawn by	PM
Checked by	KB

9996-GA-004

Scale 1 : 100



1 3D Front



2 3D Back

No.	Description	Date
A		24/01/2026
B	Building Update	26/01/2026
C	Building Update	12/02/2026
D	Biomass System Updated Location	24/02/2026
E	Machinery, LEV & Biomass System Layout Updated	19/03/2026

Oliver Bullock

3 Stepfield, Freebournes Industrial Estate, Witham, Essex, CM8 3TH

3D Views

Project number	9996
Date	19/03/2026
Drawn by	PM
Checked by	KB

9996-GA-005

Scale

APPENDIX FCL-003-2026

Process Description

Forest Contracts Ltd manufactures a wide range of bespoke joinery and wood-based products for commercial and residential applications. The company is relocating its existing operations to a new site which provides the opportunity to introduce improved process layout, dust extraction systems and energy recovery systems, which together enhance the environmental performance of the installation.

The manufacturing process utilises a range of timber products, including MDF, plywood, chipboard, laminated boards, and soft and hard wood, supplied by two major companies, Lathams and Meyer Timber. These materials are delivered to the site in sheet form and are unloaded and transferred to an automated storage system (HOMAG StoreTeq), which supplies material to the production machinery as required.

The first stage of the process involves cutting operations carried out using automated panel saws integrated with the storage system. Following the cutting stage, panels are transferred to additional machining equipment, including CNC machines, drilling machines, sanding machines, and edge processing machinery, where further machining operations are undertaken to produce the finished components required for joinery manufacture.

During these operations, sawdust and wood shavings are generated. All woodworking machinery within the facility is connected to a centralised dust extraction system designed to capture and remove wood dust and particulate matter generated during machining processes. The dust extraction system is supplied by Fercell Engineering Ltd and incorporates a high efficiency multi-breather screw filter unit fitted with anti-static polyester filter media with an approximate total filtration area of 350 m^2. Filtered air from the system is discharged to atmosphere, via high flux exhaust cowls.

Dust and shavings captured by the extraction system are discharged from the filter hopper through a rotor valve into a pneumatic transfer system. This provides enclosed, low-maintenance material transfer with improved reliability and reduced mechanical wear compared to chain conveyor systems. In addition to dust captured from machining processes, smaller timber offcuts generated during production are also utilised as fuel. These offcuts are placed onto a loading conveyor, which feeds a shredder, after which the shredded material is transfer through the pneumatic system to the same fuel storage silo. Offcuts that remain suitable for reuse in the manufacturing process are retained for future use. Waste materials unsuitable for combustion are segregated and removed from the site using waste skips and managed through appropriate recycling or disposal routes.

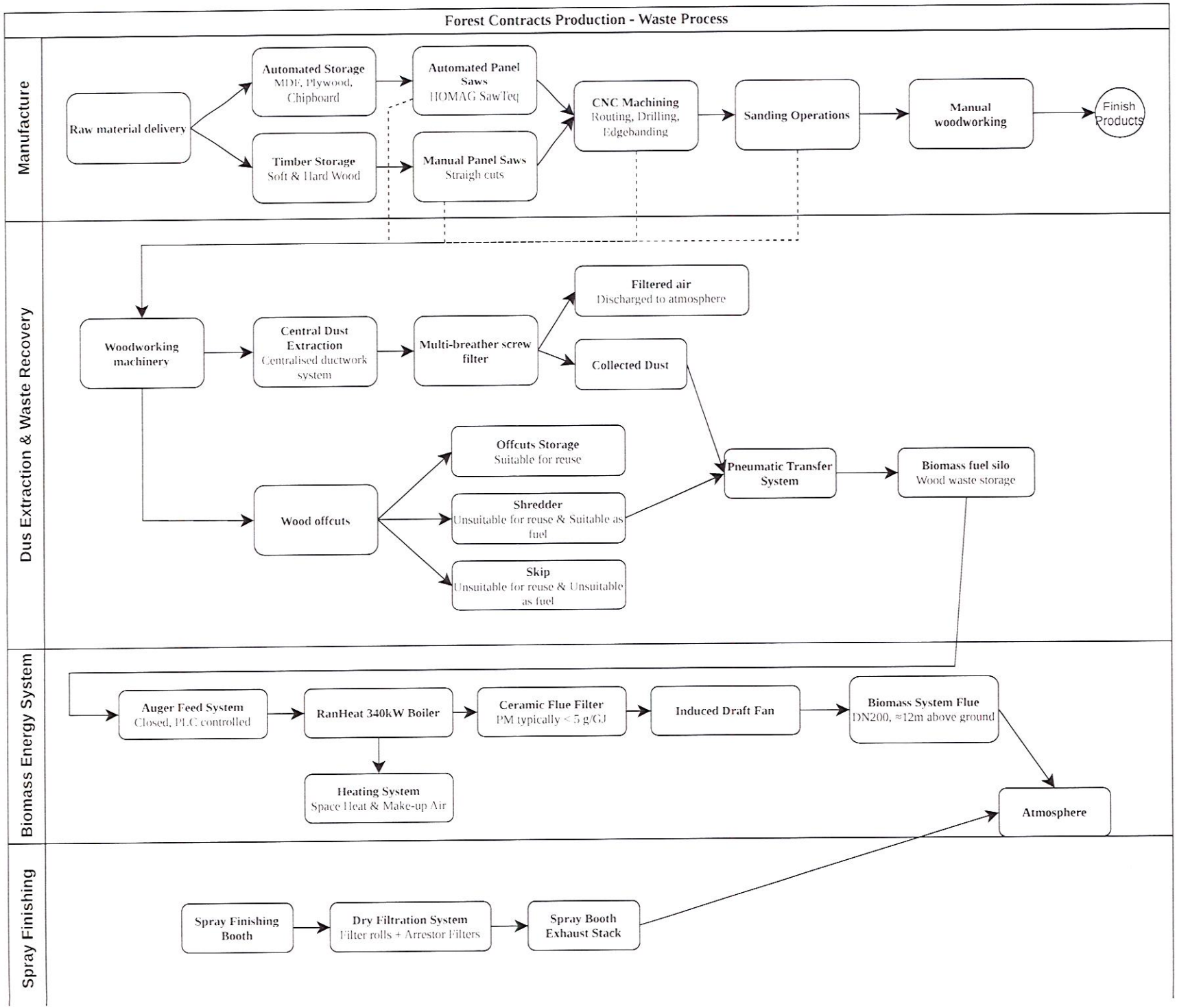
The site incorporates a RanHeat biomass boiler with a thermal output of approximately 340 kW which utilises wood waste generated on site as its fuel source. The fuel from the storage silo is transported to the combustion chamber via enclosed screw conveyor systems and fed into the boiler via a variable-speed feeder. The combustion process is controlled automatically using a programmable logic controller (PLC) which regulates fuel feed rate, combustion air supply and operating temperatures to ensure efficient combustion conditions.

Flue gases generated during combustion pass through a ceramic flue gas filter system designed to remove particulate matter before discharge to atmosphere. Following filtration, the cleaned flue gases are discharged through a twin wall insulated stainless steel chimney with an internal

diameter of 200 mm at about 180 to 200 degrees Celsius. The chimney is installed externally to the building and discharges at a height of approximately 12 metres above ground level to ensure adequate dispersion of emissions. The heat generated by the biomass boiler is used to provide space heating for the factory and office areas and to supply replacement air to process areas including finishing rooms.

The manufacturing facility also incorporates a finishing area used for the application of protective coatings to finished products. These finishing operations utilise both water-based (80%) and solvent-based lacquers. The total quantity of solvent used within the process remains below the regulatory threshold for surface coating activities and therefore the finishing operation does not constitute a regulated activity under the Environmental Permitting Regulations. The spray finishing booth is fitted with a dry filtration system comprising inlet filter media and paint arrestor filters designed to capture overspray and particulate matter prior to discharge. The extracted air from the spray booth is discharged to atmosphere via a dedicated exhaust stack located above roof level.

The installation therefore has three principal emission sources consisting of the biomass boiler chimney, the dust extraction system exhaust and the spray booth extraction system. These systems incorporate appropriate filtration and combustion control technologies to minimise emissions and ensure that the installation operates in accordance with relevant environmental standards.


Forest Contracts Production - Waste Process
Manufacture
Raw material delivery
Automated Storage
MDF, Plywood, Chipboard
Timber Storage
Soft & Hard Wood
Automated Panel Saws
HOMAG SawTeq
Manual Panel Saws
Straigh cuts
CNC Machining
Routing, Drilling, Edgebanding
Sanding Operations
Manual woodworking
Finish Products
Dus Extraction & Waste Recovery
Woodworking machinery
Central Dust Extraction
Centralised ductwork system
Multi-breather screw filter
Filtered air
Discharged to atmosphere
Collected Dust
Wood offcuts
Offcuts Storage
Suitable for reuse
Shredder
Unsuitable for reuse & Suitable as fuel
Skip
Unsuitable for reuse & Unsuitable as fuel
Pneumatic Transfer System
Biomass fuel silo
Wood waste storage
Biomass Energy System
Auger Feed System
Closed, PLC controlled
RanHeat 340kW Boiler
Ceramic Flue Filter
PM typically < 5 g/GJ
Induced Draft Fan
Biomass System Flue
DN200, ≈12m above ground
Heating System
Space Heat & Make-up Air
Atmosphere
Spray Finishing
Spray Finishing Booth
Dry Filtration System
Filter rolls + Arrestor Filters
Spray Booth Exhaust Stack

APPENDIX FCL-005-2026

Emissions and Abatement

Emissions from the installation are mainly associated with the biomass boiler, the woodworking dust extraction system and the spray finishing extraction system. The installation has been designed to minimise emissions through the use of efficient combustion control, high efficiency filtration systems and enclosed material handling processes in accordance with the principles of Process Guidance Note PG6/02 for the woodworking sector.

Particulate emissions from the biomass boiler are controlled through the use of a high efficiency ceramic flue gas filter which removes particulate matter prior to discharge to atmosphere. The boiler operates under controlled combustion conditions and is designed to fully comply with the emission limits set out under the Clean Air Act and also the much stricter requirements of the RHI 30g/GJ PM and 150 g/GJ NOx. Typical operating values are less than 5 g/GJ PM and less than 100 g/GJ Nox, see attached test certificate from accredited laboratory..

The combustion process is controlled through a PLC-based control system which continuously monitors operating parameters including combustion temperature, flue gas temperature, water temperature and filter pressure. The system automatically regulates fuel feed, combustion air supply and operating temperatures to maintain efficient combustion and optimal plant performance.

Efficient combustion is achieved through the effective application of the three “T’s”: temperature, time and turbulence. The design of the combustion retort and refractory-lined combustion chamber ensures sufficient residence time and thorough mixing of wood gases with the correct quantity of oxygen, achieving proper stoichiometric combustion conditions. This results in low emissions of CO and NOx.

The ceramic flue gas filtration system provides very high particulate removal efficiency and is particularly effective at capturing fine particulate fractions such as PM2.5. This level of filtration efficiency cannot typically be achieved by conventional multicyclone systems commonly used for flue gas cleaning. The cleaned flue gases are discharged through an induced draft fan via a 200 mm diameter twin wall insulated chimney which discharges approximately 12 metres above ground level, providing effective atmospheric dispersion. The chimney represents the only emission point associated with the biomass combustion system.

Dust generated during woodworking operations is captured at source by a centralised dust extraction system supplied by Fercell Engineering Ltd. The system incorporates a multi-breather screw filter unit fitted with anti-static polyester filter media and pulse jet cleaning to maintain filtration efficiency. The system is designed to comply with ATEX requirements for combustible wood dust and incorporates appropriate explosion protection features. Collected dust is transferred through a rotary valve and enclosed pneumatic transfer system to the biomass fuel silo, preventing the release of dust during handling.

The installation also includes a spray finishing area used for the application of coatings to finished products. The spray booth incorporates a dry filtration system consisting of inlet filter media and paint arrestor filters which capture overspray and particulate matter before the extracted air is discharged to atmosphere. Solvent usage within the finishing process remains below the regulatory threshold for surface coating activities.

Odour emissions from the installation are expected to be negligible as there has been during the operations on the current site. Woodworking operations involve the machining of untreated timber products which do not normally generate significant odour. The biomass boiler operates at high combustion temperatures with sufficient residence time within the combustion chamber to ensure complete combustion of the fuel. As a result, the plant operates free of noticeable odour under normal operating conditions.

The integrity and performance of the combustion and filtration systems are continuously monitored. Parameters such as filter pressure drop, combustion temperatures and system pressures are recorded and monitored through the plant control system. In the unlikely event of abnormal operating conditions or filter malfunction, the system automatically initiates a controlled shutdown. The control system HMI maintains a non-deletable alarm history recording operational events and equipment status, providing a permanent operational record for the plant.

Fugitive emissions are minimised through the use of enclosed extraction ductwork, sealed filtration equipment and enclosed conveyors used for the transfer of wood waste to the biomass system.

During plant start-up and shutdown the biomass system operates under controlled automated conditions. The dust extraction system remains operational whenever woodworking machinery is in use, ensuring that dust generated during start-up or shutdown conditions is captured and filtered prior to discharge.

Table 1. Emissions Source Summary

Emission Point	**Source**	**Pollutants**	**Abatement Technique**
E1	Biomass boiler flue	PM, NOx, CO, trace odour	Ceramic flue gas filter
E2	Dust extraction system	Wood dust	Fabric filtration system
E3	Spray booth extraction	Overspray particles, trace VOC	Paint arrestor filters
F1	Material handling	Fugitive dust	Enclosed systems

APPENDIX FCL-006-2026

Monitoring and Inspection

The operation of the biomass boiler, dust extraction system and associated equipment will be subject to routine monitoring and inspection.

The system will be inspected on a regular basis by site personnel. These inspections include visual observations of the dust extraction system, biomass plant and associated equipment to ensure that the system is operating correctly and without abnormal emissions. These inspections will be recorded in a site operational log.

The biomass boiler and ceramic flue gas filtration system are controlled by an automated PLC system. Key operating parameters including combustion temperature, flue gas temperature and filter pressure are continuously monitored by the control system. In the event of abnormal operating conditions the system will generate alarms and initiate a controlled shutdown if necessary.

The integrity of the filtration systems is monitored through pressure sensors and routine inspection. Maintenance of the boiler, filtration equipment and extraction system will be carried out as part of a planned preventative maintenance programme.

Periodic emissions testing of the biomass boiler may be undertaken where required to demonstrate continued compliance with relevant emission limits.

APPENDIX FCL-007-2026

Environmental Management

Forest Contracts Ltd does not operate a formal environmental management system. However, the company implements a number of operational procedures designed to ensure that the installation operates in an environmentally responsible manner.

The operation of the dust extraction system, biomass boiler and associated equipment will be subject to routine inspection and maintenance. Equipment will be maintained in accordance with manufacturer recommendations as part of a planned preventative maintenance programme.

The manufacturing process has been designed to incorporate a high degree of automation in order to reduce material handling and improve operational efficiency within the factory.

Wood waste generated during machining operations is transferred to the biomass fuel silo using a pneumatic transfer system. This arrangement provides enclosed, low-maintenance material transfer with improved reliability, reduced mechanical wear compared to chain conveyor systems, and reduced the potential for dust leakage to the atmosphere.

The biomass boiler and associated plant operate under automated control with variable speed motors and process monitoring to ensure efficient operation of the combustion and filtration systems.

Operational records, including inspection logs and maintenance activities, will be maintained to demonstrate that the installation continues to operate in accordance with the requirements of the environmental permit.

APPENDIX FCL-008-2026

Environmental Impact

The environmental impact of the new installation is expected to be minimal due to the design of the manufacturing process and the emission control systems implemented on site.

Wood dust generated during machining operations is captured at source by the centralised dust extraction system and conveyed to the biomass silo. Larger offcuts are retained for reuse where possible, while smaller material is directed through a shredding system prior to being conveyed to the silo.

The dust extraction system incorporates automatic control of airflow through the use of motorised blast gates. This allows extraction to be directed only to machines in operation, improving system efficiency and reducing overall energy consumption.

Cleaned air from the filtration system is discharged to atmosphere and may be partially recirculated back into the building where appropriate. This improves energy efficiency within the facility while maintaining effective dust control.

The collected wood waste is used as fuel within a biomass boiler system with a thermal output of approximately 340 kW. Fuel is transferred from the storage silo to the combustion system via enclosed augers and is combusted under controlled conditions. This boiler fully meets the strict emission requirements of the government's Renewable Heat Incentive and work towards the government's targets on the use of renewable energy.

The combustion process is automatically controlled and the resulting flue gases pass through a high efficiency ceramic filtration system prior to discharge to atmosphere via a dedicated flue stack. In keeping with good practice, the boiler is not allowed to idle as per the requirements of PG1/12 (13) even though the boiler falls below the limit for inclusion on the guidance note it can meet the requirements of it.

The installation also delivers a number of significant positive environmental benefits. The biomass boiler enables the company to be entirely self-sufficient for space heating and process air supply, eliminating the need for a separate fossil fuel heating system. The on-site combustion of wood waste removes the requirement to transport at least three large skips of waste material off-site each week, avoiding a minimum of six additional commercial vehicle movements on the local road network. In addition, the pneumatic dust transfer system eliminates the need for daily visits by a waste contractor to remove sawdust bags for disposal elsewhere. These reductions in vehicle movements represent a direct benefit to local air quality and traffic congestion. The use of wood waste as a renewable fuel source supports the government's targets on the use of renewable energy and contributes to a reduction in the overall carbon footprint of the operation.

With regard to the finishing operations, as part of the company's environmental policy, Forest Contracts Ltd is actively moving away from the use of solvent-based products. The majority of coatings applied are already water-based (approximately 80%), and the company is working towards eliminating solvent-based products entirely over the next two years. This ongoing transition will progressively reduce VOC and odour emissions from the finishing side of the operation, and it is not anticipated that finishing activities will give rise to significant odour or VOC emissions going forward.

APPENDIX FCL-009-2026

Chimney Height

The biomass boiler has a dedicated flue system designed to discharge combustion gases vertically to atmosphere via a 200 mm diameter twin-wall insulated chimney at a height of approximately 12 metres above ground level.

The chimney height has been determined with reference to the requirements of the Clean Air Act, which require emissions to be released at a height sufficient to prevent nuisance and minimise effects on human health. Guidance contained within Process Guidance Note PG1/12 and LAQM Technical Guidance (TG22) has also been taken into account.

A chimney height assessment has been carried out using the principles of the D1 Chimney Height Memorandum. The particulate matter has been taken as the limiting pollutant.

Particulate emission performance is based on the Renewable Heat Incentive (RHI) certification for the boiler, which indicates typical particulate emissions of approximately 0.5 g/GJ and a flue gas flow rate of 0.6 m^3/s have been used, which are considered representative for a biomass boiler of this type fitted with ceramic filtration. This gives an emission rate of approximately 0.012 g/s and a pollution index of 600 m^3/s.

Our boiler has a thermal input of 0.34 MW, the plume rise due to buoyancy has been calculated as 2.15 m. The plume rise due to discharge momentum, based on an exit velocity of approximately 19 m/s, is higher at 4.3 m. In accordance with D1 methodology, the lower value has been adopted as the governing plume rise.

The influence of nearby structures has also been considered. The most significant structure is the dust extraction filter unit with a height of approximately 9.6 metres. Additional surrounding buildings of approximately 6 metres in height are also present within the relevant assessment distance.

Applying D1 building correction principles, a minimum chimney height of approximately 11.75 metres has been derived. The proposed chimney height of 12 metres therefore exceeds this requirement.

Flue gases are discharged at temperatures typically in the range of 180–200°C, providing thermal buoyancy and assisting dispersion. The chimney is fitted with an induced draft fan and designed for vertical, unimpeded discharge without caps or restrictive terminals.

The boiler incorporates PLC-based combustion control which regulates fuel feed, combustion air and operating conditions. Particulate emissions are controlled using a ceramic filtration system, achieving low emission levels. The system is designed to comply with the requirements of the Clean Air Act and Renewable Heat Incentive emission standards (30 g/GJ particulate matter and 150 g/GJ NOx), with typical operating values significantly below these limits; average 0.5g/GJ and 82.3g/GJ, respectively, according to the Renewable Heat Incentive (RHI) certificate, see attached.

Taking into account the scale of the installation (340 kW biomass boiler), the emission control systems in place, the operating history of the same plant at a previous site without reported adverse environmental impacts, and the absence of nearby sensitive receptors at critical distances, the chimney height is considered adequte to ensure effective dispersion of emissions.

APPENDIX FCL-010-2026

Air Screening Modelling

Forest Contracts Ltd is applying for a new Environmental Permit to operate a biomass boiler at its furniture manufacturing premises at 3 Stepfield, Freebournes Industrial Estate, Witham, Essex. The boiler burns waste wood produced on-site as a heat source for the building.

This report assesses whether emissions from the boiler chimney could affect the health of people living or working nearby. The assessment used ADMS 6.0, a computer modelling tool recognised by the Environment Agency, with four years of local weather data (2021 to 2024) to cover a wide range of wind and weather conditions. Emission rates were based on the maximum limits permitted under the government's Renewable Heat Incentive scheme, representing a worst-case scenario.

The results show that the boiler will have a negligible effect on local air quality. At the nearest residential property, approximately 30 metres from the site boundary, the boiler's contribution to air pollution is a very small fraction of the levels considered safe for human health. The operation of the proposed biomass boiler is not expected to have any significant effect on local air quality or on human health.

1 INTRODUCTION

1.1 The Study

Forest Contracts Ltd has prepared this Air Dispersion Modelling Report in support of a new Environmental Permit application to the Environment Agency for the operation of a biomass boiler at its furniture manufacturing premises at 3 Stepfield, Freebournes Industrial Estate, Witham, Essex, CM8 3TH.

The site is also the subject of a concurrent planning application (Reference 26/00251/FUL) submitted to Braintree District Council for extensions and alterations to the premises, including the installation of the boiler and associated plant. The Environmental Permit application is being progressed in parallel with that planning process.

The assessment was undertaken to determine the potential impact of emissions from the boiler on human health at sensitive receptor locations in the vicinity of the site. The modelling was carried out using ADMS 6.0 Screening Mode, one of the atmospheric dispersion models recognised by the Environment Agency as suitable for this type of regulatory assessment.

The approximate location of the site is shown in Figure 1.

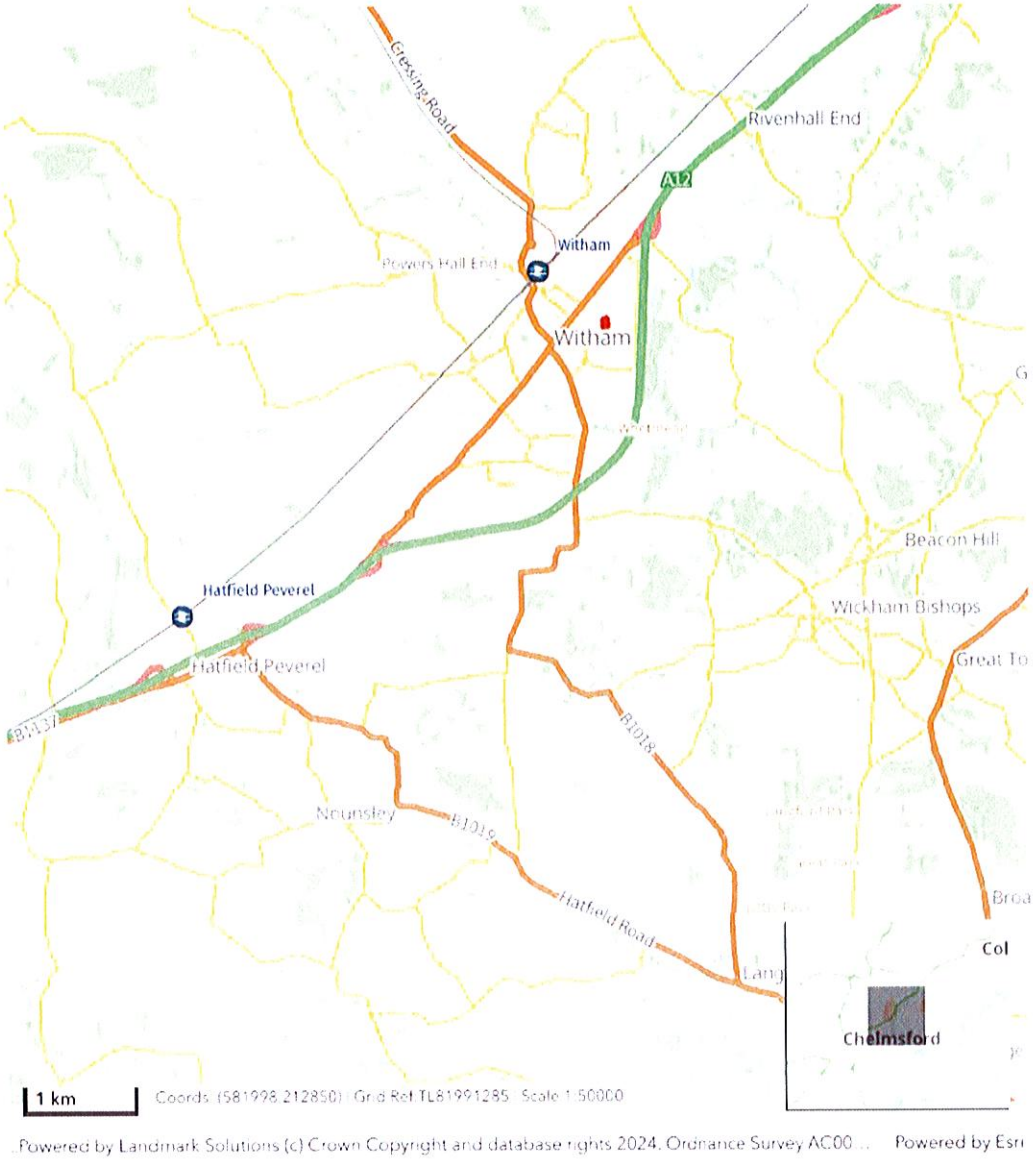


Figure 1. Site Location Map

1.2 Objectives of the Study

The objectives of this study are to:

- Determine the maximum ground-level concentrations arising from emissions from the boiler chimney, referred to throughout this report as BOILER_CHIMNEY
- Assess the potential impact of those concentrations on human health at sensitive receptor locations, by comparison with the relevant air quality environmental standards

1.3 Scope of the Study

The installation consists of a single Ranheat 340 kW biomass boiler installed at the site. The boiler combusts waste wood generated on-site as part of the furniture manufacturing process, including wood offcuts, chips and sawdust. It is fitted with a ceramic flue gas filter for particulate control.

The assessment covers the single point source emission from BOILER_CHIMNEY only. No other emission sources at the site require assessment under the Environmental Permit.

The following pollutants were modelled:

- Nitrogen Dioxide and Oxides of Nitrogen
- Particulate Matter — PM_{10}
- Fine Particulate Matter — $PM_{2.5}$

The assessment covers human health impacts only. A review of the Magic Map spatial planning database confirmed that there are no internationally or nationally designated ecological sites within a distance that would require assessment for an installation of this scale. An ecological assessment has therefore not been carried out.

2 METHOD STATEMENT

2.1 Choice of Model

The assessment was carried out using ADMS 6.0 Screening Mode, developed by Cambridge Environmental Research Consultants. ADMS is a Gaussian plume dispersion model based on established atmospheric science and is recognised by the Environment Agency as suitable for regulatory air quality assessments. The screening mode is appropriate for this assessment given that the installation comprises a single point source of limited scale, and the objective is to establish the maximum ground-level concentrations under worst-case conditions.

ADMS 6.0 Screening Mode processes one year of sequential hourly meteorological data per model run. Four separate runs were conducted, one for each year of data available from the local meteorological station for the period 2021 to 2024. The results from all four runs are presented in this report and the highest predicted concentrations across the four-year dataset are used as the basis for the assessment.

2.2 Key Assumptions

Emission rates were based on the maximum permitted limits under the Renewable Heat Incentive scheme (150 g/GJ for oxides of nitrogen and 30 g/GJ for particulate matter) applied to the rated boiler output of 340 kW. This represents a conservative worst-case scenario, as actual operational emissions are expected to be lower than these limits during normal operation.

Nitrogen dioxide concentrations were derived by applying a conversion factor of 70% of the total NOx emission rate for all averaging periods. This is the long-term conversion factor recommended in the Environment Agency guidance for combustion processes. Applying this factor to the short-term assessment is conservative, as the short-term guidance value would be 35%. This approach is therefore considered acceptable for a screening assessment.

No terrain treatment was applied. The site is located on low-lying flat ground and there are no significant topographical features within the modelled domain that would influence plume behaviour.

Building downwash was applied. The Fercell dust extraction and filtration unit located immediately adjacent to the boiler chimney was included as the modelled building, as described in Section 2.10.

2.3 Sensitive Human Receptors

A review of the surrounding land use was carried out to identify potentially sensitive human receptors in the vicinity of the site. The site is within Freebournes Industrial Estate, where the

surrounding land use is predominantly industrial and commercial. The nearest residential property lies approximately 30 metres from the site boundary to the west.

Four discrete receptor locations were included in the assessment, as detailed in Table 1. All receptors were assessed at ground level.

Table 1. Discrete Receptor Locations

Receptor	Description	East (m)	North (m)
Residential_30m	Nearest residential property to the site, located approximately 30 m from the site boundary	582,594	214,735
NE Site Limit	North-east boundary of the site	582,663	214,811
SE Site Limit	South-east boundary of the site	582,669	214,739
NW Site Limit	North-west boundary of the site	582,624	214,789

2.4 Air Quality Standards for the Protection of Human Health

The relevant air quality environmental standards applied in this study are presented in Table 2.

Table 2. Environmental Assessment Levels — Human Health

Pollutant	Averaging Period	Standard (µg/m³)	Percentile	Source
NO_2	Annual mean	40	—	UK Air Quality Objectives
NO_2	1-hour mean	200	99.79th	UK Air Quality Objectives
PM_{10}	Annual mean	40	—	UK Air Quality Objectives
PM_{10}	24-hour mean	50	90.41st	UK Air Quality Objectives
$PM_{2.5}$	Annual mean	25	—	WHO Global Air Quality Guidelines 2021

2.5 Background Air Quality

Background air quality concentrations for the site area were obtained from the Defra Local Air Quality Management Background Concentration Maps, downloaded April 2026, for the 1 km × 1 km grid square at NGR 582,500 E / 214,500 N, which encompasses the site. The concentrations are presented in Table 3.

Table 3. Background Air Quality Concentrations

Pollutant	Background Concentration (µg/m³)	Source
NO_2	11.983	Defra LAQM Background Maps 2026
NOx	15.950	Defra LAQM Background Maps 2026
PM_{10}	15.330	Defra LAQM Background Maps 2026
$PM_{2.5}$	9.010	Defra LAQM Background Maps 2026

2.6 Stack Emission Parameters

The installation consists of a single Ranheat 340 kW biomass boiler fitted with a ceramic flue gas filter for particulate control. The boiler combusts waste wood generated on-site, including offcuts, chips and sawdust. The emission point is referred to throughout this report as BOILER_CHIMNEY. The stack parameters used in the model are presented in Table 4.

Table 4. Stack Emission Parameters

Parameter	Value	Units
Emission point identifier	BOILER_CHIMNEY	—
East	582,649	m (OSGB36)
North	214,743	m (OSGB36)
Stack height above ground level	12.0	m
Stack exit internal diameter	0.20	m
Stack exit temperature	190 (463 K)	°C
Stack exit velocity	19.0	m/s
Volumetric flow rate (actual conditions)	0.5969	m^3/s

The pollutant emission rates used in the model are presented in Table 5. Rates were derived from the maximum permitted emission limits under the Renewable Heat Incentive scheme applied to the rated boiler output of 340 kW, as detailed in the Basis column.

Table 5. Pollutant Emission Rates

Pollutant	Emission Rate (g/s)	Basis
NOx	0.05100	RHI limit 150 g/GJ × 0.340 GJ/s
NO_2	0.03570	70% of NOx — see Section 2.2
PM_{10}	0.01020	RHI limit 30 g/GJ × 0.340 GJ/s
$PM_{2.5}$	0.01020	Equal to PM_{10} — conservative assumption

2.7 Meteorological Data

ADMS has a meteorological pre-processing capability which calculates the required boundary layer parameters from input data. Meteorological data were utilised in sequential hourly form for input to the Gaussian plume dispersion calculations, which estimates the pattern of dispersion through 10° sectors from the source or as raw data.

The nearest suitable meteorological data available from the Met Office MIDAS Open dataset is from Andrewsfield recording station, MIDAS Station ID 19188, located approximately 17 km north-west of the site at NGR E568,742 / N224,778. This station is considered representative of meteorological conditions at the site given its proximity and comparable local topography, both

locations are situated on low-lying agricultural land in the Essex/Hertfordshire border area, with no significant intervening topographical features.

Data were available for the four-year period 2021 to 2024. A separate model run was conducted for each year. The meteorological data statistics reported by ADMS for each run are summarised in Table 6.

Table 6. Summary of Meteorological Data — Andrewsfield Station, 2021–2024

Year	Total Hours	Hours Used	Hours with Inadequate Data	Hours Below 0.75 m/s	Calm Hours
2021	8,760	8,593	46	121	0
2022	8,760	8,562	61	137	0
2023	8,760	8,523	93	144	0
2024	8,760	8,505	117	162	0

Across all four years, the proportion of hours with inadequate data ranges from 0.5% (2021) to 1.3% (2024), which is considered acceptable for this type of assessment. No calm conditions were recorded in any year. Hours with wind speeds below the minimum threshold of 0.75 m/s are excluded from the long-term calculations; this is standard practice within ADMS and does not affect the validity of the results.

The prevailing wind direction at Andrewsfield during the period 2021–2024 is from the south-west. Wind roses for each year are presented in Figure 2.

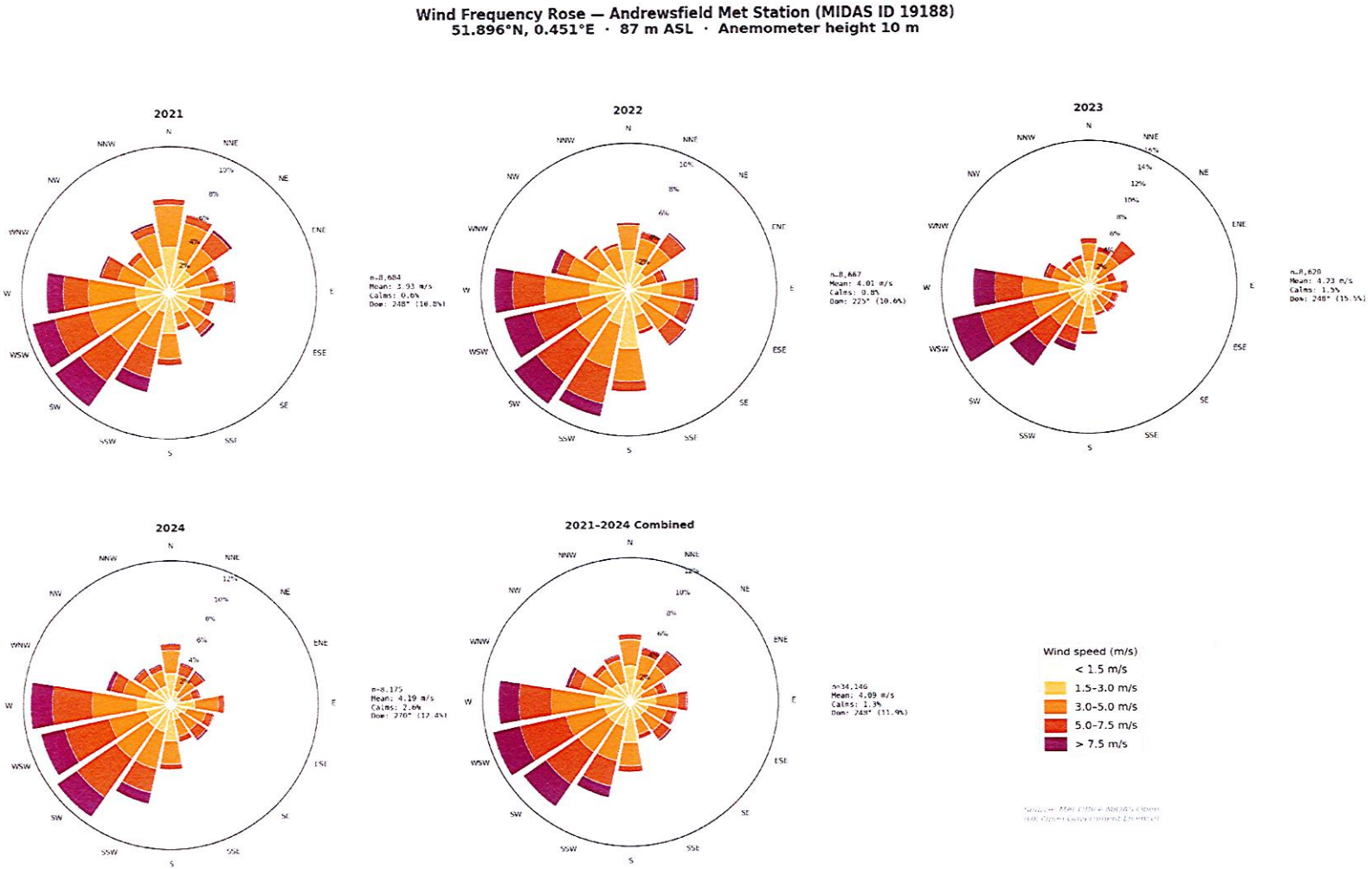


Figure 2. Wind roses

2.8 Surface Characteristics

The surface characteristics applied in the model are presented in Table 7. A surface roughness of 0.5 m was selected as representative of the mixed land use within the model domain, comprising industrial buildings, hard standing and open areas — consistent with the ADMS guidance classification for open suburbia and light industrial terrain.

Table 7. Surface Characteristics

Parameter	Value	Basis
Surface roughness (z_0) — met station	0.1 m	Open agricultural terrain at Andrewsfield
Surface roughness (z_0) — dispersion domain	0.5 m	Mixed industrial/suburban terrain
Albedo	0.23	ADMS default — temperate UK
Priestley-Taylor parameter	1.0 (dimensionless)	ADMS default — temperate UK

2.9 Model Output Parameters

The model was run using a regular Cartesian receptor grid covering an area of 2,000 m × 2,000 m centred on the site, with 31 × 31 receptor points at a spacing of approximately 67 m. The grid configuration is detailed in Table 8. All receptors were placed at ground level.

Table 8. Receptor Grid Configuration

Parameter	Value
X BNG	581,638 to 583,638 m
Y BNG	213,769 to 215,769 m
Grid spacing	~66.7 m (regular)
Number of receptor points	31 × 31 = 961
Receptor height	Ground level (0 m)

In addition to the gridded output, four discrete receptor locations were included as specified points, as listed in Table 1.

The pollutant output configuration is summarised in Table 9.

Table 9. Pollutant Output Configuration

Pollutant	Averaging Period	Percentile / Statistic	Threshold (µg/m^3)
NO_2	1-hour mean	99.79th percentile	200
NOx	Annual mean	Long-term average	—
PM_{10}	24-hour mean	98.08th and 90.41st percentiles	50
PM_{10}	Annual mean	Long-term average	—

Pollutant	*Averaging Period*	*Percentile / Statistic*	*Threshold (µg/m³)*
$PM_{2·5}$	Annual mean	Long-term average	—

2.10 Buildings Data

Building downwash effects were included in the assessment. ADMS Screening Mode permits the definition of a single building, so the structure most likely to influence plume behaviour was selected. The Fercell dust extraction and filtration unit is located adjacent to the boiler chimney to the south and is the tallest structure in the immediate vicinity of the emission point.

The building parameters used in the model are presented in Table 10, according to Fercell equipment specification.

Table 10. Building Parameters

Parameter	*Value*
Building identifier	Fercell_filter
Shape	Rectangular
East	582,647 m
North	214,739 m
Height	9.6 m
Length	5.175 m
Width	2.35 m
Orientation angle	90°

The ratio of chimney height to building height is 1.25, which is below the 2.5H threshold above which building downwash effects become negligible. Its inclusion in the model is therefore appropriate and results in a conservative assessment of near-field ground-level concentrations.

3 ASSESSMENT OF AIR QUALITY IMPACTS AT THE MAXIMUM GROUND LEVEL CONCENTRATIONS

3.1 Maximum Predicted Ground Level Concentrations

The maximum predicted ground-level process contributions from BOILER_CHIMNEY across the full receptor grid are presented in Table 11 for all four meteorological years. The highest value recorded across the four-year dataset is identified as the worst-case process contribution for each pollutant and averaging period.

Table 11. Maximum Predicted Process Contributions — Grid Results

Pollutant	Averaging Period	Percentile	2021 (µg/m³)	2022 (µg/m³)	2023 (µg/m³)	2024 (µg/m³)	Worst Case (µg/m³)	Worst Year
NO_2	1-hour mean	99.79th	5.967	5.964	5.888	5.936	**5.967**	2021
NO_2	Annual mean	Long-term	0.652	0.639	0.848	0.898	**0.898**	2024
NOx	Annual mean	Long-term	0.932	0.913	1.212	1.283	**1.283**	2024
PM_{10}	24-hour mean	98.08th	0.860	0.870	0.950	1.415	**1.415**	2024
PM_{10}	24-hour mean	90.41st	0.591	0.598	0.716	0.688	**0.716**	2023
PM_{10}	Annual mean	Long-term	0.185	0.182	0.240	0.256	**0.256**	2024
$PM_{2.5}$	Annual mean	Long-term	0.186	0.183	0.242	0.257	**0.257**	2024

The worst-case process contributions across the four-year dataset are presented in Table 12, alongside the relevant environmental assessment levels and the process contribution expressed as a percentage of each standard.

Table 12. Worst-Case Maximum Process Contributions — Comparison with Environmental Assessment Levels

Pollutant	Averaging Period	Percentile	Max PC (µg/m³)	EAL (µg/m³)	PC as % of EAL
NO_2	1-hour mean	99.79th	5.967	200	2.98%
NO_2	Annual mean	Long-term	0.898	40	2.25%
NOx	Annual mean	Long-term	1.283	—	—
PM_{10}	24-hour mean	90.41st	0.716	50	1.43%
PM_{10}	Annual mean	Long-term	0.256	40	0.64%
$PM_{2.5}$	Annual mean	Long-term	0.257	25	1.03%

The Environment Agency screening criteria define a process contribution as insignificant where the short-term PC is less than 10% of the relevant short-term standard, and the long-term PC is less than 1% of the relevant long-term standard. Where a process contribution exceeds the long-term criterion, a full assessment of the Predicted Environmental Concentration is required.

The short-term process contributions for NO_2 (2.98% of the 1-hour standard) and PM_{10} (1.43% of the 24-hour standard) are both below the 10% screening criterion. The long-term process

contribution for PM_{10} (0.64% of the annual standard) is below the 1% criterion and can be considered insignificant without further assessment. The long-term process contributions for NO_2 annual mean (2.25%) and $PM_{2.5}$ annual mean (1.03%) exceed the 1% criterion and a full PEC assessment has been carried out for these pollutants, as presented in Section 3.2.

3.2 Predicted Environmental Concentrations at Maximum Impact Locations

The Predicted Environmental Concentration is calculated by adding the background concentration to the worst case process contribution. The PEC assessment is presented in Table 13.

Table 13. Predicted Environmental Concentrations — Worst Case Grid Locations

Pollutant	Averaging Period	Max PC (µg/m³)	Background (µg/m³)	PEC (µg/m³)	EAL (µg/m³)	PEC as % of EAL
NO_2	1-hour mean (99.79th)	5.967	11.983	17.950	200	8.98%
NO_2	Annual mean	0.898	11.983	12.881	40	32.20%
PM_{10}	24-hour mean (90.41st)	0.716	15.330	16.046	50	32.09%
PM_{10}	Annual mean	0.256	15.330	15.586	40	38.97%
$PM_{2.5}$	Annual mean	0.257	9.010	9.267	25	37.07%

All predicted environmental concentrations are well within the relevant standards. The PECs are dominated by existing background concentrations rather than the process contribution from the boiler, which accounts for less than 3% of the total predicted concentration in every case.

3.3 Assessment at Discrete Sensitive Receptor Locations

The predicted process contributions at the four discrete receptor locations (Figure 3) are presented in Table 14. Values were extracted from the nearest gridded receptor point to each specified location.

Figure 3. Discrete Receptor Locations

Table 14. Worst-Case Process Contributions at Discrete Receptor Locations (µg/m³)

Receptor	Nearest Grid Point	Distance (m)	NO_2 Annual	NO_2 P99.79 1hr	NOx Annual	PM_{10} P90.41 24hr	PM_{10} Annual	$PM_{2.5}$ Annual
Residential_30m	582,571 / 214,702	39.8	0.278	4.935	0.398	0.349	0.079	0.080
NE Site Limit	582,638 / 214,836	35.1	0.233	4.925	0.333	0.251	0.068	0.067
SE Site Limit	582,638 / 214,769	43.1	0.030	2.688	0.043	0.034	0.009	0.009
NW Site Limit	582,638 / 214,769	24.4	0.030	2.688	0.043	0.034	0.009	0.009

The predicted environmental concentrations at the two receptors with the highest process contributions (Residential_30m and NE Site Limit) are presented in Tables 15 and 16 respectively.

Table 15. Predicted Environmental Concentrations at Residential_30m

Pollutant	Averaging Period	PC (µg/m³)	Background (µg/m³)	PEC (µg/m³)	EAL (µg/m³)	PEC as % of EAL
NO_2	1-hour mean (99.79th)	4.935	11.983	16.918	200	8.46%
NO_2	Annual mean	0.278	11.983	12.261	40	30.65%

PM_{10}	24-hour mean (90.41st)	0.349	15.330	15.679	50	31.36%
PM_{10}	Annual mean	0.079	15.330	15.409	40	38.52%
$PM_{2.5}$	Annual mean	0.080	9.010	9.090	25	36.36%

Table 16. Predicted Environmental Concentrations at NE Site Limit

Pollutant	Averaging Period	PC ($\mu g/m^3$)	Background ($\mu g/m^3$)	PEC ($\mu g/m^3$)	EAL ($\mu g/m^3$)	PEC as % of EAL
NO_2	1-hour mean (99.79th)	4.925	11.983	16.908	200	8.45%
NO_2	Annual mean	0.233	11.983	12.216	40	30.54%
PM_{10}	24-hour mean (90.41st)	0.251	15.330	15.581	50	31.16%
PM_{10}	Annual mean	0.068	15.330	15.398	40	38.49%
$PM_{2.5}$	Annual mean	0.067	9.010	9.077	25	36.31%

The SE Site Limit and NW Site Limit share the same nearest grid node and show process contributions that are negligible across all pollutants and averaging periods. Their predicted environmental concentrations are effectively equal to background and are not presented in detail.

All predicted environmental concentrations at the discrete receptor locations are well within the relevant standards. At the nearest residential property the boiler contributes less than 0.7% to the total predicted annual mean NO_2 concentration and less than 0.9% to the total predicted annual mean $PM_{2.5}$ concentration.

3.4 Isopleths

Contour plots of the predicted process contributions from BOILER_CHIMNEY are presented as Figures 4 to 8. The plots cover the full 2,000 m × 2,000 m modelled domain and are based on the gridded output from the worst-case meteorological year for each pollutant, as identified in Table 11.

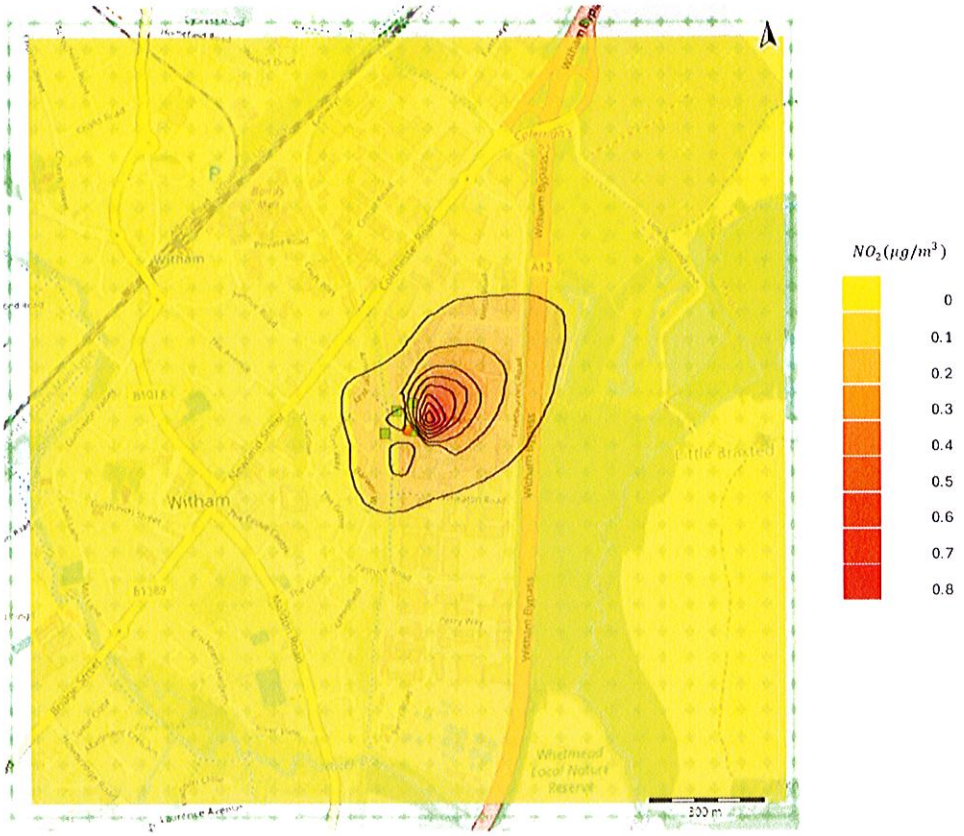


Figure 4. NO_2, annual mean process contribution ($\mu g/m^3$), Met Year 2024

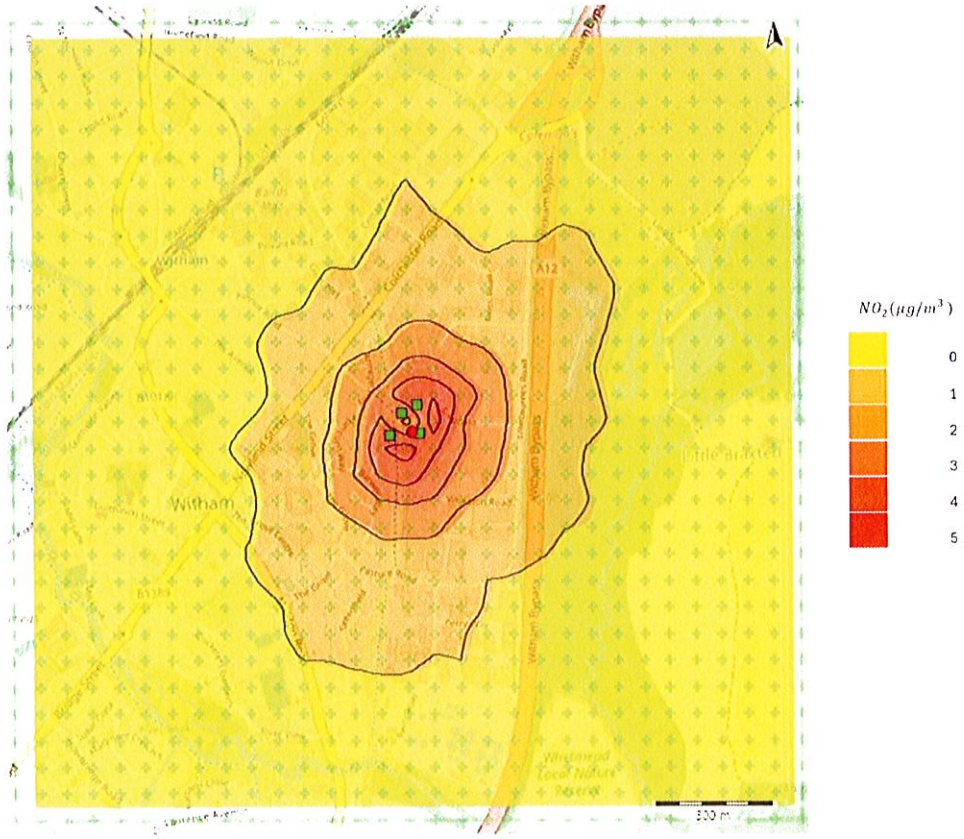


Figure 5. NO_2, 99.79th percentile 1-hour mean process contribution ($\mu g/m^3$), Met Year 2021

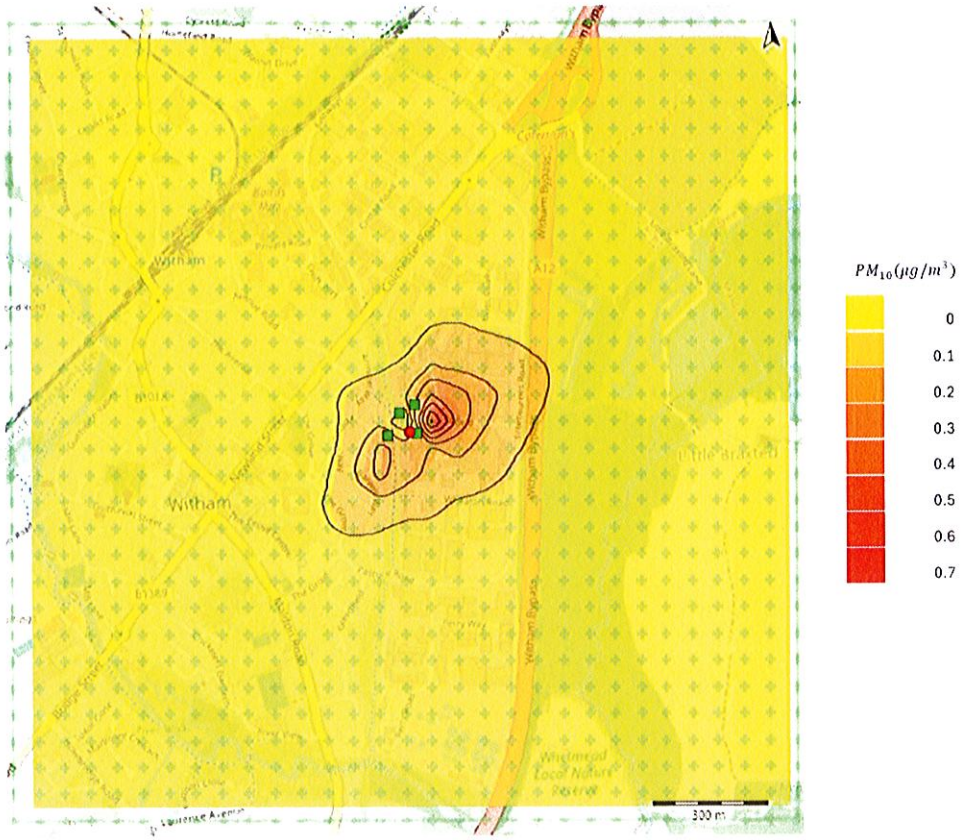


Figure 6. PM_{10}, 90.41st percentile 24-hour mean process contribution (µg/m^3), Met Year 2023

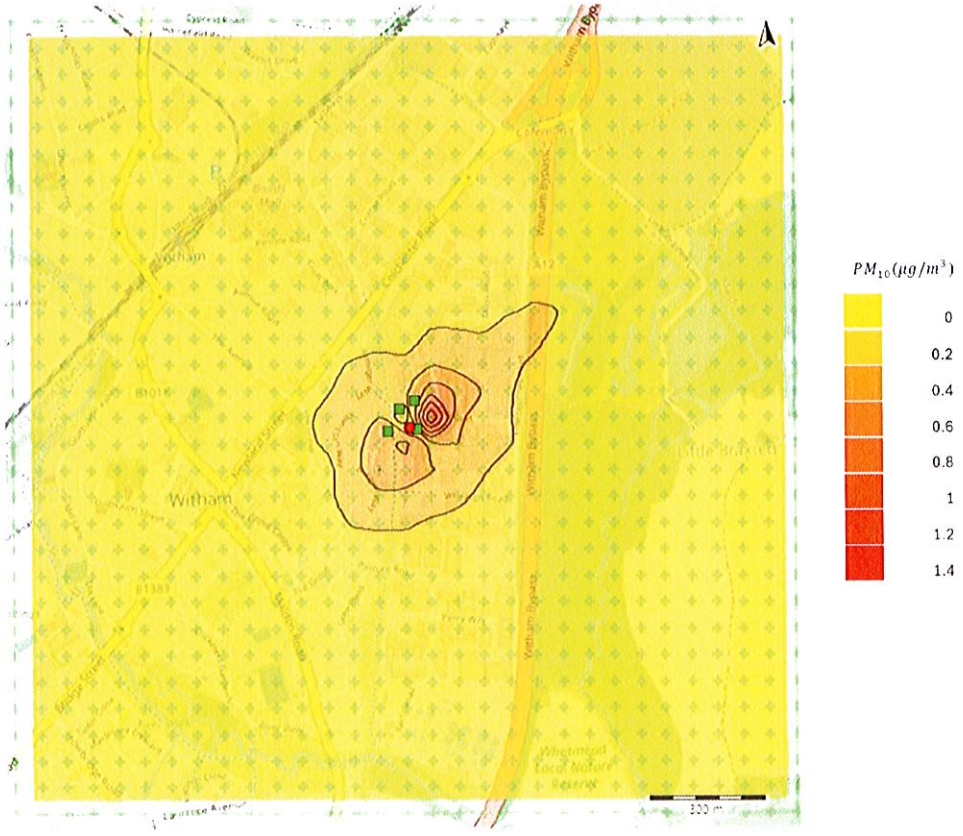


Figure 7. PM_{10}, 98.08th percentile 24-hour mean process contribution (µg/m^3), Met Year 2024

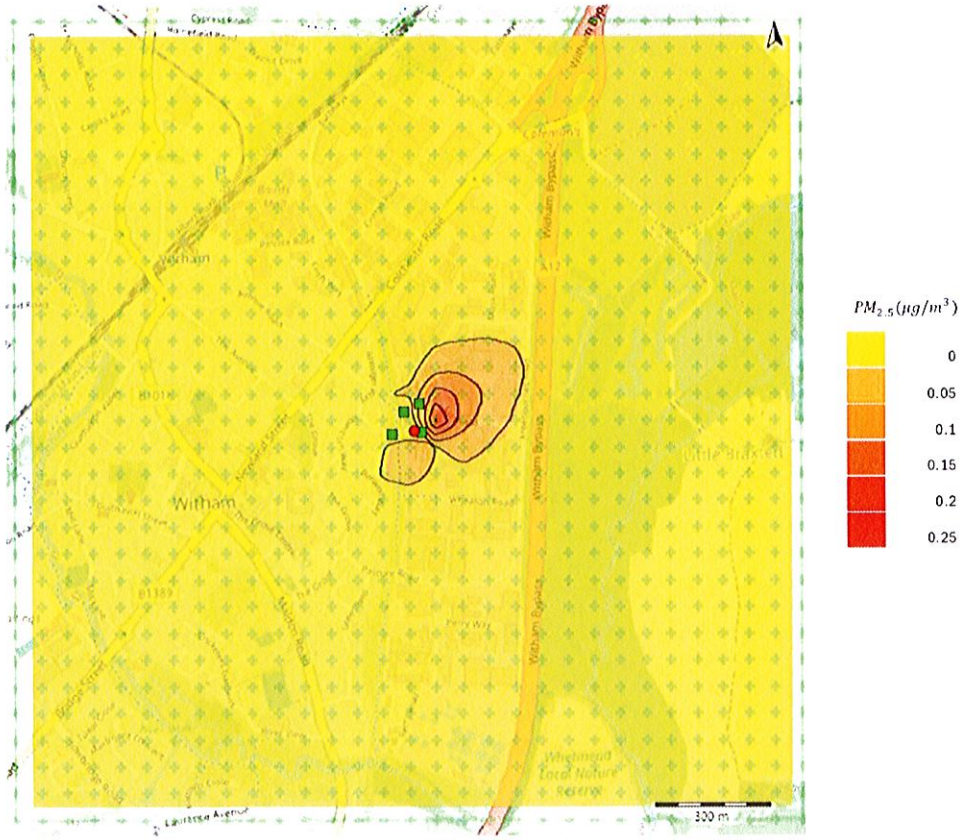


Figure 8. $PM_{2.5}$, annual mean process contribution ($\mu g/m^3$), Met Year 2024

The contour plots confirm the pattern indicated by the numerical results. The zone of maximum impact is in the near field downwind of the emission point, within the industrial estate, and concentrations fall rapidly with distance in all directions. The footprint of the plume is small relative to the modelled domain, a consequence of the combination of a relatively tall, high-velocity stack and the building downwash effect of the adjacent Fercell filtration unit. The nearest residential receptor lies outside the zone of maximum concentration and experiences process contributions well below those predicted at the point of maximum impact.

4 CONCLUSIONS

An air dispersion modelling assessment has been carried out for the proposed biomass boiler installation at 3 Stepfield, Freebournes Industrial Estate, Witham, Essex, CM8 3TH, operated by Forest Contracts Ltd. The assessment was undertaken using ADMS 6.0 Screening Mode in accordance with the Environment Agency guidance on air dispersion modelling reports for environmental permit applications.

The modelled emission source is a single Ranheat 340 kW biomass boiler combusting waste wood generated on-site as part of the furniture manufacturing process. Emission rates were based on the maximum permitted limits under the Renewable Heat Incentive scheme, representing a conservative worst-case scenario. Building downwash effects from the adjacent Fercell dust extraction and filtration unit were included in the assessment. Four separate model runs were conducted using sequential hourly meteorological data from Andrewsfield recording station for each of the years 2021 to 2024, and the highest predicted concentrations across the four-year dataset were used as the basis for the assessment.

The short-term process contributions for NO_2 and PM_{10} are below the Environment Agency screening criterion of 10% of the relevant short-term standard. The long-term process contribution for PM_{10} is below the 1% screening criterion. The long-term process contributions for NO_2 annual mean (2.25% of the standard) and $PM_{2.5}$ annual mean (1.03% of the standard) exceed the 1% criterion and a full PEC assessment was carried out for these pollutants.

All predicted environmental concentrations are well within the relevant air quality standards at every location in the modelled domain. At the nearest residential property, located approximately 30 metres from the site boundary, the boiler contributes less than 0.7% to the total predicted annual mean NO_2 concentration and less than 0.9% to the total predicted annual mean $PM_{2.5}$ concentration. The PECs at all receptor locations are dominated by existing background air quality rather than emissions from this installation.

The proposed biomass boiler at 3 Stepfield, Freebournes Industrial Estate, Witham will not cause significant air quality impacts at any sensitive receptor location. On this basis, the grant of an Environmental Permit for the installation is supported by this assessment.

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1. TEST HOUSE	
a) name and address of testing laboratory	Envirocare Technical Consultancy Ltd. Bradford Chamber Business Park, New Lane Bradford, BD4 8BX
b) name and signature of the person authorised by the testing laboratory to issue the certificate	Name: Kyle Barbour
	Signature:
c) date of issue of this certificate together with certificate reference number *Please see Note A	Date: *23/11/2022 (original 13/10/2014)*
	Ref: *ETC_RHI_009v9_RANHEAT_NIMLOCK*
d) if testing laboratory is accredited to BS EN ISO/IEC 17025:2005, date of accreditation and accreditation number *(note: if testing conducted after 24 September 2013, the testing laboratory **must be** BS EN ISO/IEC 17025:2005 accredited)*	Date: December 2003 Latest update May 2022
	Accreditation number: 2522

envirocare UKAS TESTING

2. PLANT *Please see Note B*	
a) name of the plant tested	Ranheat MSU195 or Danstoker Multimiser 12 195kW boiler incorporated into a Ranheat system with ceramic flue gas filter.
b) model of the plant tested	Ranheat MSU195 or Danstoker Multimiser 12 195kW boiler incorporated into a Ranheat system with ceramic flue gas filter.
c) manufacturer of the plant tested	Ranheat Engineering Limited, 62 St James Mill Road, Northampton NN5 5JP & Danstoker a-s, Industrivej Nord 13, DK-7400 Herning
d) installation capacity* of the **tested** plant in kilowatts (kW) *defined in the RHI Regulations as the total installed peak heat output capacity of the plant	195 kW
e) is the plant a manually stoked, natural draught plant? (that is, without a fan providing forced or induced draught)	No
f) (i) the 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.	*30/09/2014* Yes
g) list of all the plants in the type-testing range* of 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.*	195kW, 240kW, 300kW, 350kW & 360kW. The type test applies to all models stated above.

[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	B2 - 1.2 By-products and residues from wood processing industry (As stated in Table 2 BS EN ISO 17225-4) – Sizing P16 (As stated in Table 1 BS EN ISO 17225-4)
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) *(based if relevant on classifications from BS EN ISO 17225-4)*	B2 - 1.2 By-products and residues from wood processing industry (As stated in Table 2 BS EN ISO 17225-4) – (As stated in Table 1 BS EN ISO 17225-4) Sizing P16
c) moisture content of the fuel used during testing	5-20 %
d) maximum moisture content* of the fuel which can be used with the certified plant(s) so as to ensure that the RHI emission limits are not exceeded. ** This value may be obtained from ranges specified in EN 303-5 based on the fuel type(s) tested*	20%

4. TESTS	
Confirm which requirements the emissions of NOx and PM have been tested in accordance with. **Either 4a or 4b should be confirmed, the other should be 'not applicable'**	
a) **if the testing was carried out in accordance with the provisions relevant to emissions of PM and NOx in either BS EN 303-5:1999 or BS EN 303-5:2012**[2], please confirm: - the test was conducted to whichever standard was current at the time of testing.	BS EN 303-5:1999: no BS EN 303-5:2012: no
b) **if the testing was carried out in accordance with the following requirements,** please confirm: (i) testing was carried out in accordance with: - EN 14792:2005 in respect of NOx emissions, and; - EN 13284-1:2002 or ISO 9096:2003 in respect of PM emissions[3]; and (ii) emissions of PM represent the average of at least three measurements of emissions of PM, each of at least 30 minutes duration; and (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 (100% of capacity)
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 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.	0.4;0.7;0.5g/GJ Average 0.5g/GJ
f) measured* emissions of NOx in **g/GJ** net heat input *this 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.	82.3g/GJ

[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.

SHARPS REDMORE

ACOUSTIC CONSULTANTS • Established 1990

Report

Forest Contracts, Maidens Industrial Unit, High Easter

Noise Assessment

Prepared by
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Date 9th April 2024
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ANC ACOUSTICS & NOISE CONSULTANTS

Contents

Appendices

1.0 Introduction

1.1 Sharps Redmore have been appointed by Forest Contracts Ltd to undertake a sound level assessment of the activities at Maidens Industrial Unit which operates as a commercial furniture manufacturer.

1.2 The operating hours are generally 0700-1600 hours with no regular night time work unless demand calls. The only noise source at night will be the biomass boiler flue. No activity is planned on Saturday, Sunday or public holidays.

1.3 Sharps Redmore have been appointed to review the sound levels likely to arise from the operations during the proposed hours and what the likelihood of impact is at the nearest residential property at approximately 350m to the north at the Green Street junction.

1.4 Section 2 of this report briefly describes the site and surroundings. Section 3 provides further details on the proposal, and sound sources. Section 4 sets out the relevant assessment methodology and criteria.

1.5 An indicative sound level assessment of the proposed operations is detailed in Section 4, and finally the conclusions and recommendations are set out in Section 5.

2.0 The Site & Surroundings

2.1 The site is located on Green Street, High Easter approximately 350m to the south of the nearest receptor at the junction.

2.2 Ambient, maximum and background sound levels are principally controlled by local road traffic from both these roads, together with aircraft noise from nearby Stansted Airport. During the night-time period (2300 to 0700 hours) it is expected that road traffic would be infrequent. In the experience of Sharps Redmore, night-time background sound levels at such a site can therefore be expected to be low, and at times below 30 dB $L_{A90,T}$.

2.3 The proximity of the site to the nearest residential property is shown below as Figure 2.1. Other residential properties exist in the area but are further away and our assessment considers the closest as worst case.

Figure 1: Site position and nearest residential property

3.0 Assessment Methodology and Criteria

National Policy

3.1 The National Planning Policy Framework (NPPF), as amended in December 2023, sets out the Government's economic, environmental and social planning policies for England and "these policies articulate the Government's vision of sustainable development." In relation to noise, paragraph 191 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. In doing so they should:*
>
> - *a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
> - *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

3.2 The NPPF and NPPG reinforce the March 2010 DEFRA publication, "Noise Policy Statement for England" (NPSE), which states three policy aims, as follows:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life."*

3.3 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

"... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur."

3.4 Therefore taking an overview of national policy it is clear that when considering the impact of noise one must consider the significance of any impact. The presence of an adverse impact in itself is not sufficient to refuse permission.

3.5 Objective guidance on the assessment of noise from plant and machinery can be found in BS 4142:2014 +A1:2019 which describes a method for rating and assessing sound of an industrial and/or commercial nature according to the following summary process:

i) Determine the background sound levels, in terms of L_{A90}, at the receptor locations of interest.

ii) Determine the specific sound level of the source being assessed, in terms of L_{AeqT} level (T = 1 hour for day or 15 minutes at night), at the receptor locations.

iii) Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent or other characteristic which attract attention.

iv) Compare the rating sound level against the background noise level; the greater the difference between the two, the higher the likelihood of complaints of the noise.

v) Differences (rating – background) of around +10 dB is likely to be an indication of significant adverse impact (SOAEL) depending on context; a difference of +5 dB is likely to be an indication of adverse impact, depending on context. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending upon context.

3.6 The general intent of the planning system is to ensure that a development does not result in 'significant adverse impacts on health and quality of life' (NPPF para 180). BS 4142:2014 +A1:2019 considers that the threshold of 'significant adverse impact' is likely to be around 10 dB or more... depending on upon the context.

3.7 BS 4142:2014 comments further with reference to low levels in section 11 in the assessment of impacts and context. It maintains that where background and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true for night time or where daytime levels are also low.

3.8 As can been seen above the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound exceeds the background sound level and the context in which it is placed.

3.9 Sharps Redmore has previously consulted many local authorities on sound levels to be achieved in quiet rural areas. For these applications, acoustic assessments were submitted and it was agreed that a design target of 30-35 dB (rating level) at night in those quiet rural areas was achievable and justified. The identification and acceptance of a fixed (absolute) threshold value is in keeping with the advice in BS 4142:2014[1] for situations of low background and rating levels. (See clause 11, Note 2 of the BS 4142:2014).

3.10 This states that... *"where background levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background level. This is especially true at night".*

3.11 A sound level of 30 dBA external to a building (but not immediately at the façade) would normally be reduced by the façade structure to a level indoors of less than 20 dBA. This a conservative figure based on the performance of the façade with a slightly open window further to guidance within the WHO guidelines.

[1] BSI.BS4142:2014. Methods for rating and assessing industrial and commercial sound

3.12 Guidance from the WHO[2] and BS 8233[3] indicates sound levels in bedrooms at night ought not exceed 30 dBA (30 dB $L_{Aeq,8hrs}$) in order to avoid disturbance, hence externally present sound at a level of 35 dB would not be deemed excessive. Indeed, levels of up to around 40 dB ($L_{Aeq,8hrs}$) external to dwellings would satisfy the WHO and BS 8233 thresholds. In the interests of minimising disturbance, Sharps Redmore routinely recommend no more than 35 dB ($_{rating\ level}$) for sound at night in quiet rural areas. A range of 30 dB to 35 dB (as a rating level) has been agreed on similar projects with other local planning authorities.

[2] World Health Organisation. (WHO). 1999. Guidelines for community noise.
[3] BSI.BS 8233:2014. Guidance on sound insulation and noise reduction for buildings.

4.0 Sound Level Assessment

4.1 In terms of the assessment of sound from the proposal affecting the nearest residential receptor at the junction of Green Street, it is appropriate to consider how the 'rating' level of sound from the operations may compare with the level of background sound and with guidelines on absolute threshold values. This is the advice within BS 4142:2014, specifically at Clause 11 of the BS ('Assessment of the impacts'), sub-paragraph '1)', "*Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night*".

4.2 Background sound levels have been sampled over approximately a 24- hour period including all of the night time period over the 19th-20th February 2024. Full details of survey data are available upon request. A Norsonic 140 type 1 SLM was installed close to the junction of Green Street chosen to be representative of the nearest residential property. The weather was cold and dry with a light breeze suitable for noise measurements. The SLM was calibrated before survey and checked afterwards with no noticeable drift. The noise climate is dominated by local road traffic noise and aircraft. Night time background levels are low, such as below 30 dB $L_{A90,T}$ between 2300 and 0500. The rating levels are also likely to be low. Accordingly, the guidance on absolute sound levels in dwellings contained with BS 8233:2014 is worthy of review. BS 4142 itself refers to BS 8233. The results are summarised below in tables 4.1-4.3, and are shown graphically at Appendix A. Full survey data is available upon request.

Table 4.1

Day 1	
LAeq Log Average	48
LAeq Range	36 - 53
LA10 Average	46
LA90 Typical	34
LA90 Range	29 - 39
LAFmax Range	46 - 81
LAFmin Range	27 - 36

Table 4.2

Day 2	
LAeq Log Average	51
LAeq Range	41 - 54
LA10 Average	52
LA90 Typical	42
LA90 Range	37 - 47
LAFmax Range	52 - 75
LAFmin Range	35 - 42

Table 4.3

Night - 1	
LAeq Log Average	49
LAeq Range	29 - 62
LA10 Average	36.6
LA90 Typical	29.7
LA90 Range	25 - 41
LA90 Typical	26
LAFmax Range	38 - 84
LAFmin Range	23 - 36

4.3 By way of an explanation on the term 'rating' level, this is the measured or predicted average sound level in terms of $L_{Aeq,t}$ (meaning the equivalent energy average value over time 't') which has been corrected, if necessary for its duration and character, as per BS 4142.

4.4 The BS 4142 numerical assessment method rates the significance of the impact by comparing the rating level with the background level. A difference (rating minus background) of around +10 dB is likely to be an indication of a significant adverse impact; around +5 dB is likely to be an indication of an adverse impact, and around +0 dB and lower, an indication of a low impact, all depending on the context.

4.5 At this stage, Sharps Redmore take the view that the level of background sound at night is low, that is less than around 30 dB ($L_{A90,T}$). Accordingly, BS 4142 would tend to indicate a rating level of similarly low value as being of a low impact, depending on the context. For this type of operation, sound at a rating level between 30 to 35 dB ($L_{Ar,t}$) is normally considered acceptable by Local Planning Authorities and Sharps Redmore have taken this approach when assessing sound levels at the planning application stage.

4.6 The prediction of the sound level at the nearest residential receptor is made on the worst-case basis that there may be night-time periods when the biomass boiler will be in operation.

4.7 Sound pressure level data for the equipment to be used for the processes has been measured at the site, together with a typical indoor reverberant level. External plant noise from the flue and filters is also considered and is shown below and is shown below in table

4.8 The resultant sound level at the receptor (distance of 350 metres) has been calculated from the resultant internal reverberant sound level, external plant, distance attenuation, and likely indicative acoustic performance of the warehouse structure.

4.9 For the purposes of this assessment, an indicative reverberant sound level of 79 dB $L_{Aeq\ t}$ has been derived enabling an indicative sound level assessment to be undertaken against the established threshold target sound level at the nearest receptor.

Table 4.1 Internal Equipment

Internal Item Description	dBA
Internal factory shop floor	79 L_{eq1min}
Machine shop all machines running	79$L_{eq\ 1min}$
Machine shop wood cutter	76 SPL@1m
External	
Biomass boiler flue (flue height)	76 SPL@1m
Biomass boiler flue (GL) @60m	49 $L_{eq\ 1min}$

4.10 If a conservative sound reduction index of R_w=25 dB is considered as a performance for the factory building then a free field value of 48 dBA can be reasonably assumed immediately outside the factory building.

4.11 The resultant sound level from breakout through wall and roof cladding to the nearest residential receptor over 350m away will be negligible and inaudible. Subjectively, even at 60m no noise was audible from the internal operations of the site. All windows and doors are closed when the workshop is in use

4.12 If the biomass flue is considered as the only audible noise source from the site, this is attenuated by in the region of 51dB by distance attenuation alone for a point source (20log1/350) This will give a level of in the region of 28dBA outdoors at the nearest receptor.

4.13 This is a very low level, and around typical background levels for night time noise and below typical background levels for daytime noise. It is considerably below (some 20dB) existing ambient levels as measured. As discussed above, BS 4142:2014 +A1: 2019 states that ... *"where background levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background level. This is especially true at night".*

4.14 The sound level from these sources is predicted to meet the target sound rating level of 35 dBA established for the night-time assessment period. A sound level of 35 dBA external to a building (but not immediately at the façade) would normally be reduced by the façade structure to a level indoors of less than 25 dBA. This a conservative figure based on the performance of the façade with a partially open window further to guidance within the WHO guidelines and BS8233:2014.

4.15 Other noise sources associated with the site include vehicle arrivals and departures. Typically, there are 12 staff cars which arrive and depart for each shift together with 3-4 LGV movements per week delivering materials and taking away products. This level of vehicle activity is negligible on the surrounding road network.

5.0 Conclusions & Recommendations

5.1 Sharps Redmore have established a target sound level to be achieved from the operation of activities for night-time assessment periods at the nearest residential receptor in accordance with BS 4142:2014 +A1:2029.

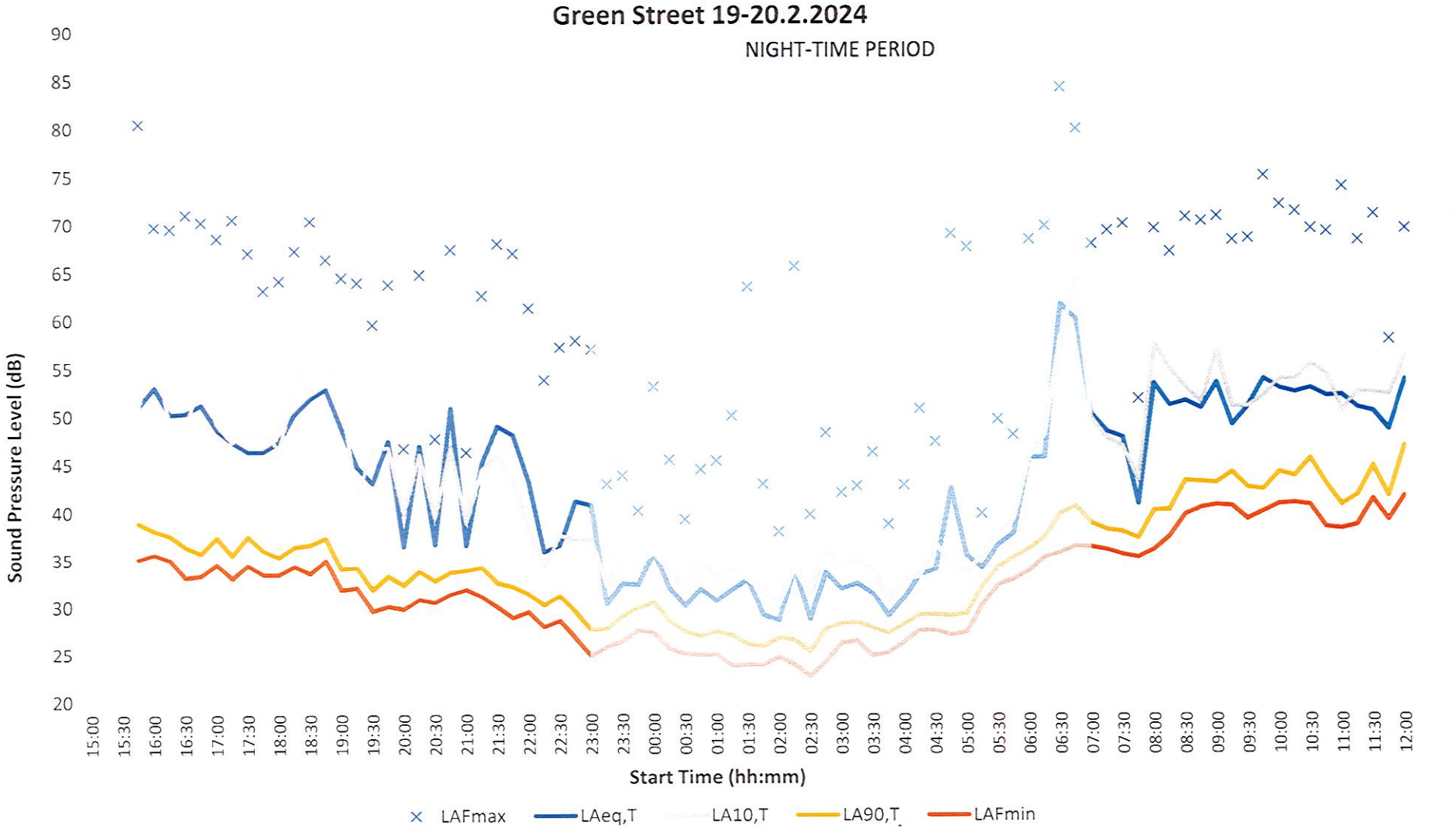
5.2 Sound levels for the external biomass boiler plant flue have been measured at roof level and at a known distance, together with internal measurements of typical activities. This has been used to predict likely levels at the nearest receptor at approximately 350m to inform a sound level assessment of the operations against the established target sound level and existing background and ambient levels.

5.3 Sharps Redmore conclude that the proposal can operate so as to achieve a protective sound rating level of below 35 dBA $L_{Aeq,15minute}$ at night at the nearest residential receptor.

5.4 The proposal can therefore operate with negligible impact from sound at the nearest noise sensitive receptor.

APPENDIX A

GRAPHICAL SUMMARY


Green Street 19-20.2.2024
NIGHT-TIME PERIOD
Sound Pressure Level (dB)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15:00
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11:30
12:00
Start Time (hh:mm)
LAFmax
LAeq,T
LA10,T
LA90,T
LAFmin