

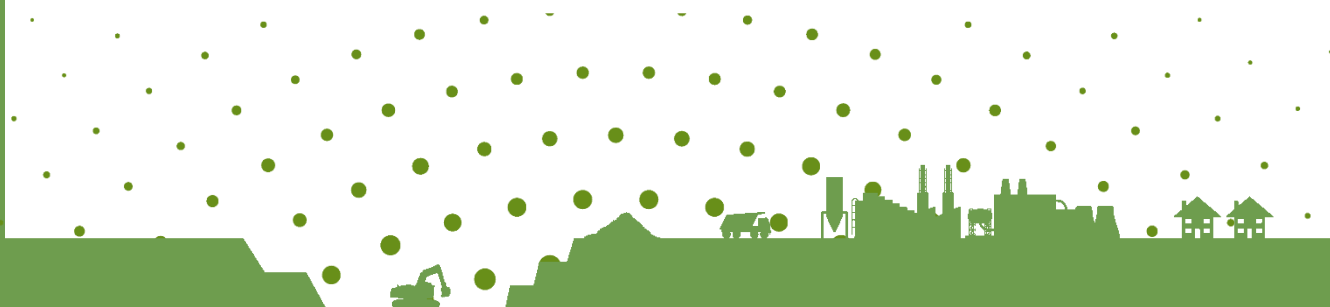


Air Quality Assessment

Pengarnddu Industrial Estate

July, 2026

Merthyr Biomass Ltd



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Table of Contents

1	Introduction	6
1.1	Objectives	6
1.2	Site Location	6
1.3	Key Pollutants	7
1.3.1	Nitrogen Dioxide (NO ₂)	7
1.3.2	Particulate Matter	7
2	Legislation, Policy and Non-Statutory Guidance	9
2.1	Legislative Framework	9
2.1.1	International Legislation (European Union)	9
2.1.2	National Legislation (UK and Wales)	9
2.2	Planning Policy	14
2.2.1	National Policy	14
2.2.2	Local (Merthyr Tydfil County Borough Council)	15
2.3	Guidance Documents	16
2.3.1	Local Air Quality Management Technical Guidance (2022)	16
2.3.2	Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) Planning Guidance	16
3	Methodology	17
3.1	Dispersion Model Selection	17
3.2	Modelled Scenarios	17
3.3	Meteorological Data	18
3.4	Surface Roughness	19
3.5	Minimum Monin-Obukhov Length	19
3.6	Source and Emission Parameters	19
3.7	Site Layout (Building and Structural Effects)	22
3.8	NO _x to NO ₂ Relationship	23
3.9	Modelled Receptors	24
3.10	Screening Criteria	26
3.11	Significance Criteria	26
3.12	Modelling Assumptions and Uncertainties	27
4	Baseline Conditions	29
4.1	Air Quality Management Areas (AQMAs)	29
4.2	NO ₂	29
4.3	Particulate Matter	29
4.4	Summary of Baseline Conditions	30

5	Potential Impacts.....	31
5.1	Proposed Biomass Boiler Process Contribution	31
5.2	Cumulative Impacts	34
5.3	Determination of Significance	36
6	Mitigation Measures.....	37
7	Conclusion.....	38
	Appendix A : RHI Certificate	39

List of Figures

Figure 1.1: Site Location.....	7
Figure 3.1: Wind roses for met data used in assessment 2022-2024.....	19
Figure 3.2: Modelled point sources and buildings	22
Figure 3.3: 3D rendering of modelled buildings and sources (view towards approximately north).....	23
Figure 3.4: Modelled Human Receptors.....	25
Figure 3.5: Modelled Grid Extent.....	25
Figure 5.1: 99.79 th percentile NO ₂ 1-Hour Mean Process Contribution Contour (2022 Met).....	33
Figure 5.2: 99.79 th percentile NO ₂ 1-Hour Mean Predicted Environmental Concentration Contour (2022 Met)	36

List of Tables

Table 2.1: AQO relevant to the proposed development	12
Table 2.2: Examples of where the AQO should apply.....	13
Table 3.1: Source geometry	20
Table 3.2: Source Emissions.....	21
Table 3.3: Source Characteristics	21
Table 3.4: Modelled building dimensions	22
Table 3.5: Modelled receptor details	24
Table 3.6: Modelled grid details.....	24
Table 3.7: Impact descriptors for predicted change in annual mean concentrations at individual receptors (Reproduced from EPUK and IAQM Guidance).....	27
Table 4.1: Backgrounds assigned to modelled receptors	30
Table 5.1: NO ₂ annual mean process contribution screening	31
Table 5.2: NO ₂ 1-hour mean process contribution screening (99.79 th percentile)	31
Table 5.3: PM ₁₀ annual mean process contribution screening.....	32
Table 5.4: PM ₁₀ 24-hour mean process contribution screening (90.41 st percentile)	32
Table 5.5: PM _{2.5} annual mean process contribution screening	32
Table 5.6: NO ₂ annual mean – IAQM impact descriptors	34
Table 5.7: PM ₁₀ annual mean – IAQM impact descriptors	34
Table 5.8: PM _{2.5} annual mean – IAQM impact descriptors	35

Glossary of Terms

Term	Definition
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Strategy
Defra	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
EPUK	Environmental Protection UK
EU	European Union
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LNR	Local Nature Reserve
MTCBC	Merthyr Tydfil County Borough Council
NAQS	National Air Quality Strategy
NO	Nitric oxide
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NRMM	Non-road Mobile Machinery
PM	Particulate Matter
Ramsar Sites	Designated Wetland
SAC	Special Areas of Conservation
SPA	Special Protection Areas
SPG	Supplementary Planning Guidance
SSSI	Sites of Special Scientific Interest
WHO	World Health Organisation

1 Introduction

Merthyr Biomass Ltd are seeking planning permission for the operation of a biomass boiler at their site at Pengarnddu Industrial Estate, Dowlais, Merthyr Tydfil. The proposal comprises the installation and operation of a Herz Industrial 995 kW boiler. The application site already has three consented biomass boilers in operation. The fuel will comprise of 2940 tonnes per annum of sustainably sourced biomass, consisting of virgin timber woodchip, forestry residue and/or bio-crops and other wood-derived biomass supplied by companies approved on the government-backed Biomass Suppliers List (BSL). Treated, mixed or hazardous waste wood will not be used as fuel.

DustScanAQ (DS) have been instructed by Technia Environment and Planning Ltd ('Technia') on behalf of their client to produce an Air Quality Assessment in support of the planning application to be submitted to the Local Authority. The assessment focuses on the potential air quality impacts associated with the operation of the proposed biomass boiler.

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 Merthyr Tydfil County Borough Council (MTCBC).

The potential air quality impacts arising as a result of the proposed development are assessed using the latest planning guidance from Environmental Protection UK (EPUK), the Institute of Air Quality Management (IAQM)¹ and the Department for Environment, Food and Rural Affairs (Defra)².

1.1 Objectives

This report provides an assessment on the following associated with the operation of the biomass boiler:

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

1.2 Site Location

The assessment site is located at Pengarnddu Industrial Estate, Dowlais, Merthyr Tydfil. The site is surrounded by other commercial uses e.g, the St Merryn/Kepak meat processing facility to the east. To the west there are two compounds supplying short term operating reserve (STOR) energy. The westernmost of these previously comprised generators with 52 associated stacks but these have now been removed and are being replaced with battery storage.

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)'.

The location of the site is shown in Figure 1.1.

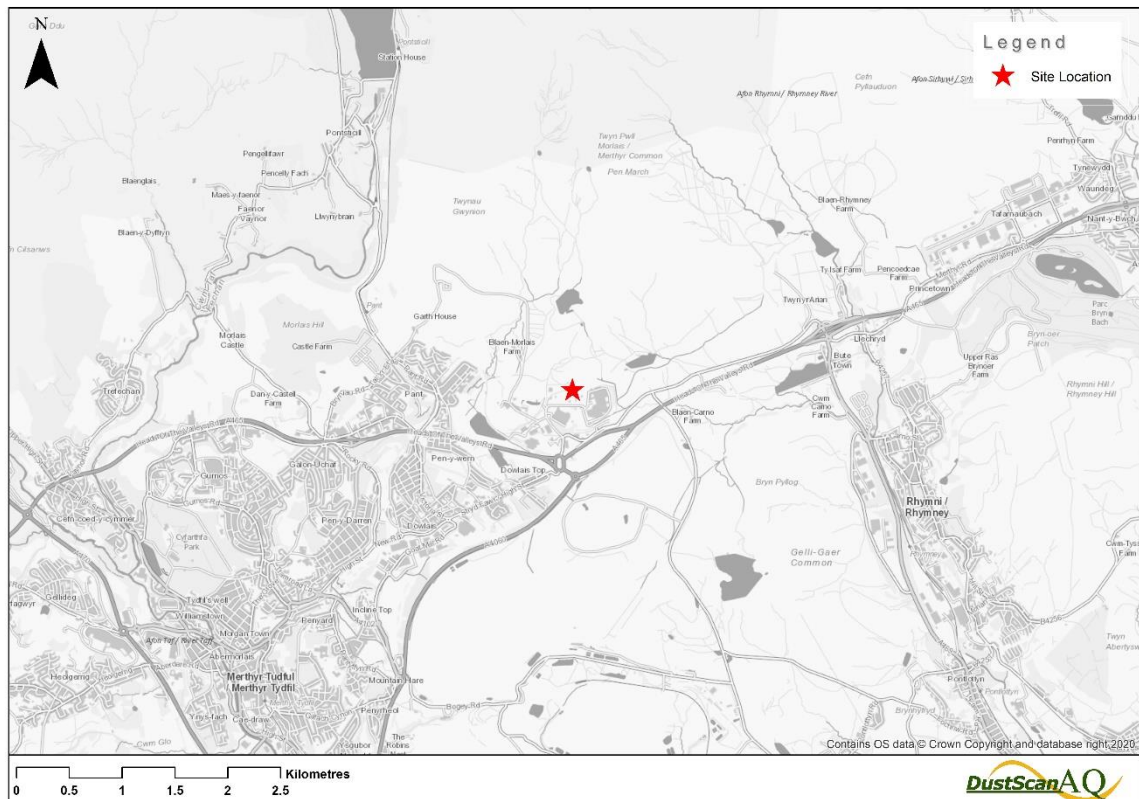


Figure 1.1: Site Location

1.3 Key Pollutants

The key pollutants associated with the operational phase of the proposed development will be biomass combustion emissions including NO_2 and particulate matter ($\text{PM}_{2.5}$ and PM_{10}). These pollutants are therefore considered as part of this assessment.

Further details of the key pollutants are presented below.

1.3.1 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 NO, which is not considered harmful. Through a chemical reaction with ozone (O_3), NO further combines with oxygen to create NO_2 which is harmful to human health and vegetation. The foremost sources of NO_2 in the UK are combustion activities, mainly road transport and power generation.

1.3.2 Particulate Matter

Particulate matter as a term refers to a mixture of solid particles and liquid droplets suspended in the 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.. Fine dust, essentially particles up to 10 microns (μm), is commonly referred to as PM_{10} .

PM_{10} is known to arise from a number of sources such as construction sites, road traffic movement, industrial and agricultural activities. Very fine particles ($\text{PM}_{0.1} - \text{PM}_{2.5}$) are known to be associated with pollutants such as NO_x and sulphur dioxide (SO_2) emitted from power plants, industrial installations and road transport sources.

$\text{PM}_{2.5}$ is generally associated with combustion and traffic sources and is more likely to be associated with the operational phase of the proposed development.

2 Legislation, Policy and Non-Statutory Guidance

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

2.1 Legislative Framework

2.1.1 International Legislation (European Union)

Whilst the UK has left the European Union (EU), it is relevant to understand the source of the current UK legislation. Following exit day on the 31st January 2020, the current framework of air quality legislation was converted into domestic law through the European Union (Withdrawal) Act 2018³. The 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/EC⁴ on ambient air quality and cleaner air for Europe entered into force in June 2008. This merged the existing 'Daughter' Directives^{5 6 7 8} (apart from the fourth Daughter Directive), maintaining existing air quality objectives set out by 'Daughter' Directives for:

- Sulphur dioxide (SO₂);
- Nitrogen dioxide (NO₂);
- Oxides of nitrogen (NO_x);
- Particulate matter (PM_{2.5} and PM₁₀);
- Lead (Pb);
- Benzene (C₆H₆);
- Carbon monoxide (CO); and
- Ozone (O₃).

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/EEC⁹.

2.1.2 National Legislation (UK and Wales)

³ European Union. (2018): <http://www.legislation.gov.uk/ukpga/2018/16/contents/enacted>

⁴ European Union. (2008), 'Ambient air quality assessment management', Framework Directive 2008/50/EC.

⁵ European Union. (1999), 'Ambient air quality assessment management', Framework Directive 1999/30/EC.

⁶ European Union. (2000), 'Ambient air quality assessment management', Framework Directive 2000/3/EC.

⁷ European Union. (2002), 'Ambient air quality assessment management', Framework Directive 2002/3/EC.

⁸ European Union. (2004), 'Ambient air quality assessment management', Framework Directive 2004/107/EC.

⁹ European Union. (1996), 'Ambient air quality assessment management', Framework Directive 96/62/EC.

2.1.2.1 The Environment Act (1995)

The Environment Act 1995¹⁰ established the system of 'local air quality management' (LAQM) and the designation of Air Quality Management Areas (AQMA). Part IV of the 1995 Environmental Act and Part II of the Environment (Northern Ireland) Order 2002¹¹ requires local authorities to designate AQMAs where legal 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.

The Environment Act 1995 required the Government to produce a National Air Quality Strategy (NAQS) for the UK, outlining the air quality standards, objectives and measures for improving ambient air quality.

2.1.2.2 National Air Quality Strategy (UK)

Following the Environment Act 1995, the first Air Quality Strategy (AQS) was published in 1997¹². The latest comprehensive review of the AQS, Air Quality Strategy for England, Scotland, Wales and Northern Ireland, was published in 2007¹³, with a review yielding some minor changes in 2011. Each revision introduced strategies and regulations that consider 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 AQS sets clear, measurable, outdoor air quality standards and target dates by which these must be achieved; the combined standard and target date is referred to as the Air Quality Objective (AQO) for that pollutant. Adopted national standards are based on the recommendations of the Expert Panel on Air Quality Standards (EPAQS) and have been translated into a set of Statutory Objectives within the Air Quality (Wales) Regulations (2000) No. 1940 (W.138), and subsequent amendments.

2.1.2.3 Air Quality Standards (Wales) Regulations (2010)

The Air Quality Standards (Wales) Regulations 2010¹⁴ simplified air quality regulation, providing a new transposition of the 2008 EU ambient air quality directive, 2005/50/EC, also incorporated the fourth EU Daughter Directive (2004/107/EC). This placed Welsh Ministers responsible for assessment and management of ambient air quality and compliance with air quality limit values, target values and objectives. The Air Quality Objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No.1940 (Wales 138), Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298).

¹⁰ Parliament of the United Kingdom. (1995), 'Environment Act'. King's Printer of Acts of Parliament

¹¹ Northern Ireland Orders in Council. (2002), 'The Environment (Northern Ireland) Order', No. 3153. King's Printer of Acts of Parliament

¹² Department for Environment Food and Rural Affairs. (1997), 'The United Kingdom National Air Quality Strategy', Cm 3587, Department for Environment Food and Rural Affairs.

¹³ 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.

¹⁴ Wales Statutory Instrument. (2010), 'The Air Quality Standards (Wales) Regulations 2010', No. 1433. King's Printer of Acts of Parliament.

2.1.2.4 The Environment (Wales) Act 2016

The Environment (Wales) Act 2016¹⁵, an Act of the National Assembly for Wales, promotes the sustainable management of natural resources (SMNR). The Act states that “natural resources” includes (but is not limited to):

“
...
(b) air, water and soil;
...”

The Environment (Wales) Act 2016 provides an iterative framework to ensure sustainable management of natural resources is a core consideration in decision-making.

Natural Resources Wales (NRW) were required to give a State of Natural Resources report (SoNaRR), published in September 2016. The second SoNaRR assessment was published in 2020 (SoNaRR2020). SMNR is assessed against of number of cross-cutting themes’, including Air Quality, published as SoNaRR2020 Assessment of the achievement of sustainable management of natural resources: Air Quality. NRW were also required to produce a local evidence base to help implement the Natural Resources Policy.

2.1.2.5 The Environment Act (2021) and the Environment (Air Quality and Soundscapes) (Wales) Act 2024

Under the Environment Act 2021¹⁶, a general UK act, the Secretary of State must by regulations set long-term targets in priority areas including air quality; however, the Secretary of State may not make any provision which, if contained in an Act of Senedd Cymru, would be within the legislative competence of the Senedd. The Environment (Air Quality and Soundscapes) (Wales) Act 2024¹⁷ creates a framework for the Welsh Ministers to set targets in relation to air quality and amends existing air quality legislation in relation to local air quality management, road user charging, anti-idling and smoke control such as the Environment Act 1995. The Act also creates new duties for the Welsh Ministers to take steps to promote awareness of the risks to human health and the natural environment caused by air pollution, and ways of reducing or limiting air pollution.

The Welsh Government has produced a draft Welsh Statutory Instrument titled The Air Quality Targets (Fine Particulate Matter) (Wales) Regulations 2026 which seeks to set new targets for PM_{2.5}. The proposed targets are an annual mean of 10 µg/m³ to be achieved by 31 December 2035, and a reduction in average population exposure of 25% by 31 December 2035.

2.1.2.6 The Well-being of Future Generations Act (2015)

The Well-Being of Future Generations (Wales) Act 2015¹⁸ (“the WFG Act”) requires the public bodies of Wales to consider the long-term impact on their decisions in pursuit of the economic, social, environmental and cultural well-being of Wales that accords with

¹⁵ Acts of the National Assembly for Wales. (2016), ‘Environment (Wales) Act 2016’. King’s Printer of Acts of Parliament

¹⁶ Parliament of the United Kingdom. (2021), ‘Environment Act’. King’s Printer of Acts of Parliament

¹⁷ Senedd Cymru. (2024), ‘Environment (Air Quality and Soundscapes) (Wales) Act 2024’

<https://www.legislation.gov.uk/asc/2024/2/data.pdf>

¹⁸ Welsh Government. (2015), ‘Well-being of Future Generations (Wales) Act 2015’

sustainable development. The Act is centred around seven well-being goals for national government, local government, local health boards and other specified public bodies.

All public bodies under this Act must adhere to the 'sustainable development principle' when making decisions. Considerations must be made to the following as part of the 'sustainable development principle':

- *“Collaboration: Acting in collaboration with any other person (or different parts of the body itself) that could help the body to meet its well-being objectives.*
- *Integration: Considering how the public body’s well-being objectives may impact upon each of the well-being goals, on their other objectives, or on the objectives of other public bodies.*
- *Involvement: The importance of involving people with an interest in achieving the well-being goals, and ensuring that those people reflect the diversity of the area which the body serves.*
- *Long-term: The importance of balancing short-term needs with the need to safeguard the long-term needs.*
- *Prevention: How acting to prevent problems occurring or getting worse may help public bodies meet their objectives.”*

The Welsh Government published statutory core guidance for public bodies to accompany the WFG Act in September 2016¹⁹.

2.1.2.7 Relevant Air Quality Objectives

A summary of the relevant Air Quality Objectives (AQOs) is set out in Table 2.1.

The AQO listed in Table 2.1 are only applicable at locations where a member of the public could be reasonably expected to spend the relevant averaging period. Further examples of this are presented in Table 2.2.

Table 2.1: AQO relevant to the proposed development

Pollutant	Averaging Period	AQO (µg/m ³)	Exceedance Allowance	Percentile Equivalent
Nitrogen Dioxide (NO ₂)	Annual	40	-	-
	1-hour	200	18 per annum	99.8 th
Particulate Matter (as PM ₁₀)	Annual	40	-	-
	24-hour	50	35 per annum	90.4 th
Particulate Matter (as PM _{2.5})	Annual	20	-	-

¹⁹ Welsh Government. (2016), 'Shared Purpose: Shared Future. Statutory guidance on the Well-being of Future Generations (Wales) Act 2015'

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.

2.1.2.8 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 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. However, it is considered as a defence if the best practicable means to prevent or to counteract the effects of the nuisance are employed.

2.2 Planning Policy

2.2.1 National Policy

2.2.1.1 National Planning Policy Wales (2021)

The Planning Policy Wales (PPW)²⁰ sets out relevant planning policy guidance in respect of the proposed development. Together with Technical Advice Notes, Welsh Government Circulars, and policy clarification letters it forms the national planning policy for Wales. The most recent update of the PPW was published in February 2021. For further details, please see the PPW.

2.2.1.2 Natural Resources Policy (2017)

Based on the findings of the first SoNaRR, the Environmental (Wales) Act 2016 required the Welsh Government to produce a national policy that sets out priorities, risks and opportunities for managing natural resources sustainably. The Natural Resources Policy²¹ identifies improving air pollution as an opportunity for improving public health, with air filtration to remove pollutants listed as a key ecosystem service, as well as improving conditions of ecosystems. The Natural Resources Policy provides actions for local environmental quality. Relating to air quality, the Welsh government states it will:

“Take practical steps to improve air quality across Wales, not just in the most polluted hotspots but across Wales. This will require a mix of action to address pollution from traffic and other sources and to improve the ability of the natural environment to absorb pollutants through tree planting and green infrastructure.”

2.2.1.3 Clean Air Strategy (2019)

The Clean Air Strategy²² was published by the Department of Environment Food and Rural Affairs (DEFRA) in 2019 as part of the 25 Year Environment Plan. It also complements the Industrial Strategy and the Clean Growth Strategy. The Strategy sets out the action that is required across governments and society to meet the AQOs. Action includes new legislation to create a more coherent framework for action to tackle air pollution, underpinned by ‘England-wide powers’ to control major sources of air pollution and ‘local powers’ to take actions in areas with an air pollution problem. These will support the creation of Clean Air

²⁰ Planning Policy Wales, Edition 11 (2021)

²¹ Welsh Government. (2017), ‘Natural Resources Policy’

²² Department of Environment Food and Rural Affairs. (2019) ‘Clean Air Strategy 2019’

Zones (CAZs) to lower emissions from all sources of air pollution, back up with clear enforcement mechanisms.

2.2.1.4 The Clean Air Plan for Wales (2020)

The Clean Air Plan for Wales²³ was published in August 2020. It aims to reduce the impacts of air pollution on human health, biodiversity, the natural environment and Welsh economy. The plan sets out a strategy until 2031 to achieve cleaner air based on four key themes, People, Environment, Prosperity and Place, with consideration made to the approaches of the WFG Act. The Clean Air Plan also includes the commitment of introducing a Clean Air Bill for Wales; this legislation is referenced above as the Environment (Air Quality and Soundscapes) (Wales) Act.

2.2.2 Local (Merthyr Tydfil County Borough Council)

2.2.2.1 Replacement Local Development Plan (2016-2031)

The MTCBC Replacement Development Plan (2016-2031)²⁴, adopted 29th January 2020, provides the local planning policy framework within the jurisdiction of MTCBC. There is one policy that directly relates to air pollution: Policy EnW4.

Policy EnW4: Environmental Protection:

“Development proposals will be required to demonstrate they will not result in an unacceptable impact on people, residential amenity, property and / or the natural environment from either:

- *Pollution of land, surface water, ground water and the air;*
- *Land contamination;*
- *Hazardous substances;*
- *Land stability;*
- *Noise, vibration, dust, odour nuisance and light pollution; or*
- *Any other identified risk to public health and safety.*

Where impacts are identified the Council will require applicants to demonstrate that appropriate measures have been incorporated to reduce, or minimise the impact identified to the lowest possible acceptable level.

Planning conditions may be imposed or legal obligation entered into, to secure any necessary mitigation and monitoring processes.

In respect of the water environment, development proposals will be required to incorporate measures to improve water quality where opportunities exist. With regard to flood risk, new developments will be expected to avoid unnecessary flood risk and meet the requirements of TAN 15. No highly vulnerable development will be permitted within Development Advice Map (DAM) zone C2. Development will only be permitted in areas at risk of flooding where it can be demonstrated that the site can comply with the justification and assessment requirements set out in TAN 15.”

²³ Welsh Government (2020) ‘The Clean Air Plan for Wales: Healthy Air, Healthy Wales’

²⁴ Merthyr Tydfil County Borough Council. (2020), ‘Replacement Local Development Plan (2016-2031).

2.3 Guidance Documents

2.3.1 Local Air Quality Management Technical Guidance (2022)

The LAQM Technical Guidance 2022²⁵ (TG22), published by the DEFRA in 2022, is designed to support local authorities in carrying out their duties under the Environment Act 1995, the Environment (Northern Ireland) Order 2002, and subsequent regulations. Any guidance or tools used in this assessment have been provided by LAQM.TG(22), in line with the Council's own work on air quality following the guiding principles.

2.3.2 Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) Planning Guidance

The Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) published guidance for the consideration of air quality within land-use planning and development control processes in January 2017²⁶. In the absence of any statutory guidance on methodology, the IAQM/EPUK guidance is considered best practice and informs this assessment.

²⁵ LAQM Technical Guidance 2022. Accessible at:

<https://laqm.defra.gov.uk/wp-content/uploads/2021/03/LAQM-TG22-May-25-v2.1.pdf>

²⁶ The Environmental Protection UK and Institute of Air Quality Management. (2017) 'Land-Use Planning & Development Control: Planning For Air Quality'. Accessible at:

<https://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>

3 Methodology

This section sets out the approach taken to assess the potential impacts on air quality during the operation of the proposed development.

The proposal is for the installation and operation of a Herz Industrial 995 kW boiler. The fuel will comprise of 2940 tonnes per annum of sustainably sourced biomass, consisting of virgin timber woodchip, forestry residue and/or bio-crops and other wood-derived biomass supplied by companies approved on the government-backed Biomass Suppliers List (BSL). Treated, mixed or hazardous waste wood will not be used as fuel. The flue of the proposed biomass boiler is proposed to be 1 m above the ridgeline. This assessment will use this stack height to assess its suitability.

The application site has three consented biomass boilers in operation. Additionally, a STOR plant is located 45 m to the west. These additional sources have been included in the assessment to assess cumulative impacts.

The process contribution at residential receptors from the proposed biomass boiler has been screened for significance using methodology from the Environmental Agency, set out in section 3.10. Additionally, Do minimum and Do Something scenarios are assessed using the IAQM significance criteria in section 3.11 for modelled residential receptor locations.

Near the application site, there are employment sites where workers are present throughout the day. Therefore, the NO₂ short-term AQO is applicable at these locations. To assess compliance against the NO₂ 1-hour average AQO, a grid has been modelled, and the contours presented in the results section of this report.

3.1 Dispersion Model Selection

Dispersion modelling of point sources was undertaken using ADMS-6, a version of the ADMS (Atmospheric Dispersion Modelling System) developed by Cambridge Environmental Research Consultants (CERC). ADMS-6 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 uses 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.

3.2 Modelled Scenarios

The proposal is for the installation and operation of a single biomass boiler. The site already has three biomass boilers in operation (the latest of these was consented in application P/18/0286). In addition, there is a STOR plant 45 m to the west.

Modelling has been undertaken for the following scenarios:

- Do Minimum – operation of the three existing biomass boilers alongside the neighbouring STOR plant;

- Do Something – As per the Do Minimum scenario with the addition of the proposed biomass boiler.

The model outputs have been set up for the:

- long-term (annual mean) NO_x concentration;
- short-term (1-hour mean) 99.79th %ile NO_x concentration;
- long-term (annual mean) PM₁₀ concentration; and
- short-term (24-hour mean) 90.41st %ile PM₁₀ concentration.

For the processing of results, 100% of PM is assumed to be PM₁₀ for comparison against PM₁₀ long and short terms AQOs. For PM_{2.5}, 100% of PM is assumed to be PM_{2.5} for comparison against the PM_{2.5} long-term AQO.

3.3 Meteorological Data

The key meteorological parameters for dispersion modelling are wind speed and wind direction. Other 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 on the above, NWP meteorological data supplied by Enviro Data Services has been used as no observed meteorological data was considered to be appropriate for the assessment location. The NWP data has the following identifiers:

- Met Site: 0002088202
- Lat, Long: 51.776825, -3.34066
- OS Grid Ref X,Y: 307602.0, 209534.6

In order to account for a variety of meteorological conditions, dispersion modelling has been carried out with meteorological data from the period 2022 to 2024. Figure 3.3 below presents the wind rose for each modelling year.

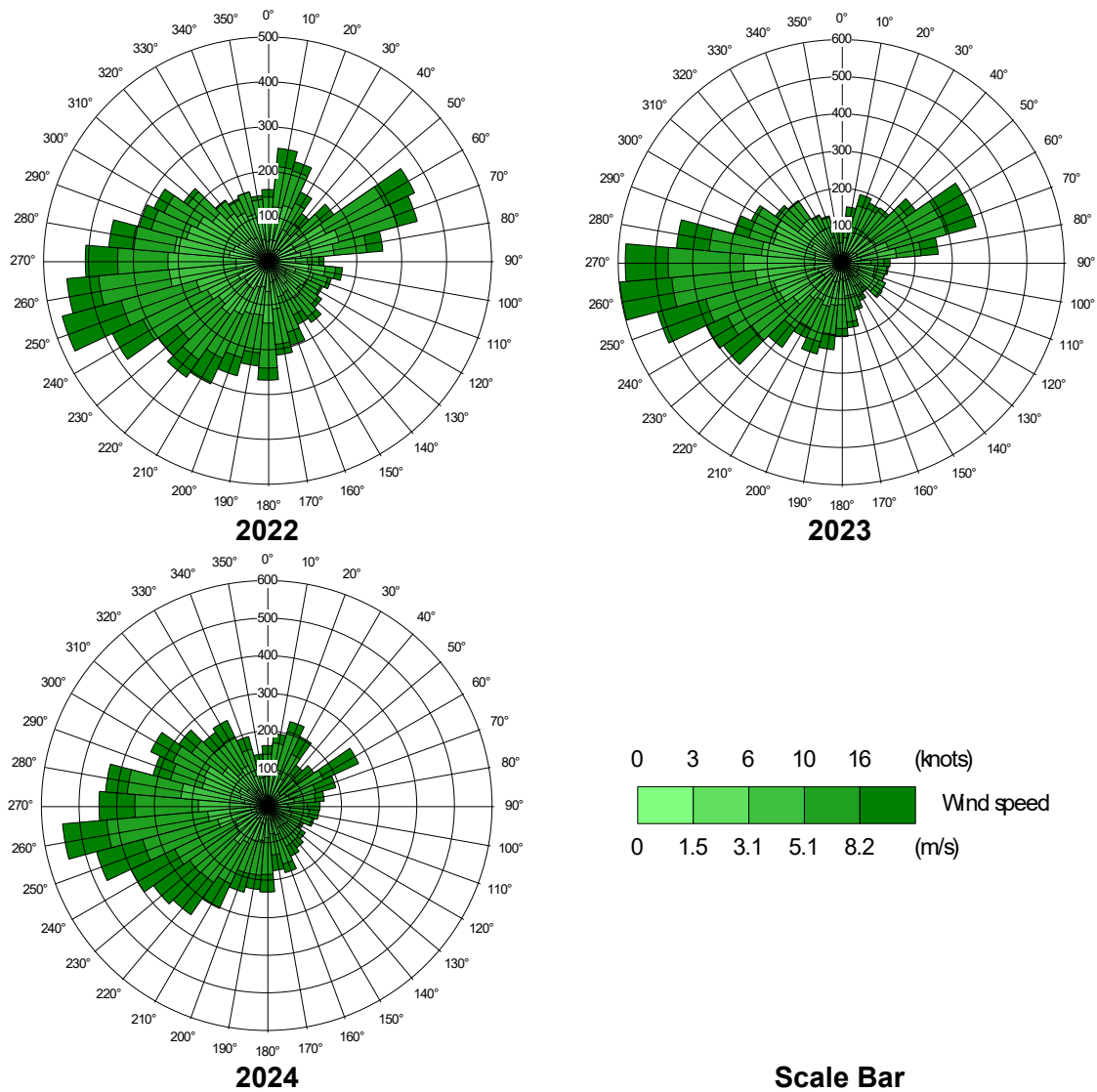


Figure 3.1: Wind roses for met data used in assessment 2022-2024

3.4 Surface Roughness

The dispersion site surface roughness length (z_0) was set to 0.5 m.

The meteorological site surface roughness length (z_0) was set to 0.5 m.

3.5 Minimum Monin-Obukhov Length

The Minimum Monin-Obukhov Length (MMOL) provides a measure of the stability of the atmosphere.

An MMOL of 10 m was used in the dispersion modelling study to describe both the modelling area and meteorological site. This value is considered appropriate for the nature of the surrounding areas.

3.6 Source and Emission Parameters

Source parameters and emissions data have been supplied by the client. Additional source data has been taken from the Air Quality Assessment associated with application P/18/0286 produced by RPS²⁷.

Source geometry is presented in Table 3.1. For the onsite biomass boilers: height of release has been supplied by Technia; X,Y data has been taken from georeferenced site plans; and internal flue diameters have been supplied by Technia. For the STOR plant: emission release height and internal flue diameter has been taken from the RPS AQA; X,Y data has been taken from georeferenced satellite imagery.

Table 3.1: Source geometry

Source	Height (m)	X (m)	Y (m)	Internal Diameter (m)	Main Building
Biomass Proposed	10.0	307913.7	208958.8	0.30	Building002,
Biomass 3	12.0	307935.5	208962.7	0.75	Building003,
Biomass 2	7.7	308002.7	208870.0	0.40	Building005,
Biomass 1	10.0	307938.0	208853.8	0.40	Building007,
STOR2_1	7.2	307828.0	208920.3	0.35	None
STOR2_2	7.2	307828.0	208914.7	0.35	None
STOR2_3	7.2	307828.1	208909.3	0.35	None
STOR2_4	7.2	307828.2	208902.2	0.35	None
STOR2_5	7.2	307828.2	208896.8	0.35	None
STOR2_6	7.2	307828.4	208884.5	0.35	None
STOR2_7	7.2	307828.5	208878.9	0.35	None
STOR2_8	7.2	307843.2	208928.5	0.35	None
STOR2_9	7.2	307843.1	208922.9	0.35	None
STOR2_10	7.2	307843.1	208915.8	0.35	None
STOR2_11	7.2	307843.2	208910.3	0.35	None
STOR2_12	7.2	307843.2	208904.9	0.35	None
STOR2_13	7.2	307843.5	208892.6	0.35	None
STOR2_14	7.2	307843.6	208887.2	0.35	None

Source emissions are presented in Table 3.2. The proposed biomass boiler is a Herz Industrial 995 kW boiler. This is the same model of boiler as Biomass 3. Emissions for the proposed biomass boiler have been calculated RHI certificate ref. CAT-4611-RHI Herz RRK

²⁷

https://enterprise.merthyr.gov.uk/PublicAccess_LIVE/Document/ViewDocument?id=52FE18A8BB2311E88416186024A3A0F0

950-1300kW Boilers (see Appendix A). Emissions for Biomass 1 and 2 and the STOR plant are taken from the RPS AQA.

Table 3.2: Source Emissions

Source Names	NOx (g/s)	PM (g/s)
Biomass Proposed	0.136	0.024
Biomass 3	0.136	0.024
Biomass 2	0.081	0.017
Biomass 1	0.081	0.017
STOR2_1 – STOR2_14	0.300	-

Source characteristics are presented in Table3.3. All parameters have been taken from the RPS AQA. The proposed biomass boiler is assumed to be the same as Biomass 3.

Table3.3: Source Characteristics

Source	Exit Velocity (m/s)	Temperature (°C)
Biomass Proposed	9.6	180
Biomass 3	9.6	180
Biomass 2	5	96.2
Biomass 1	5	96.2
STOR2_1 – STOR2_14	38	450

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

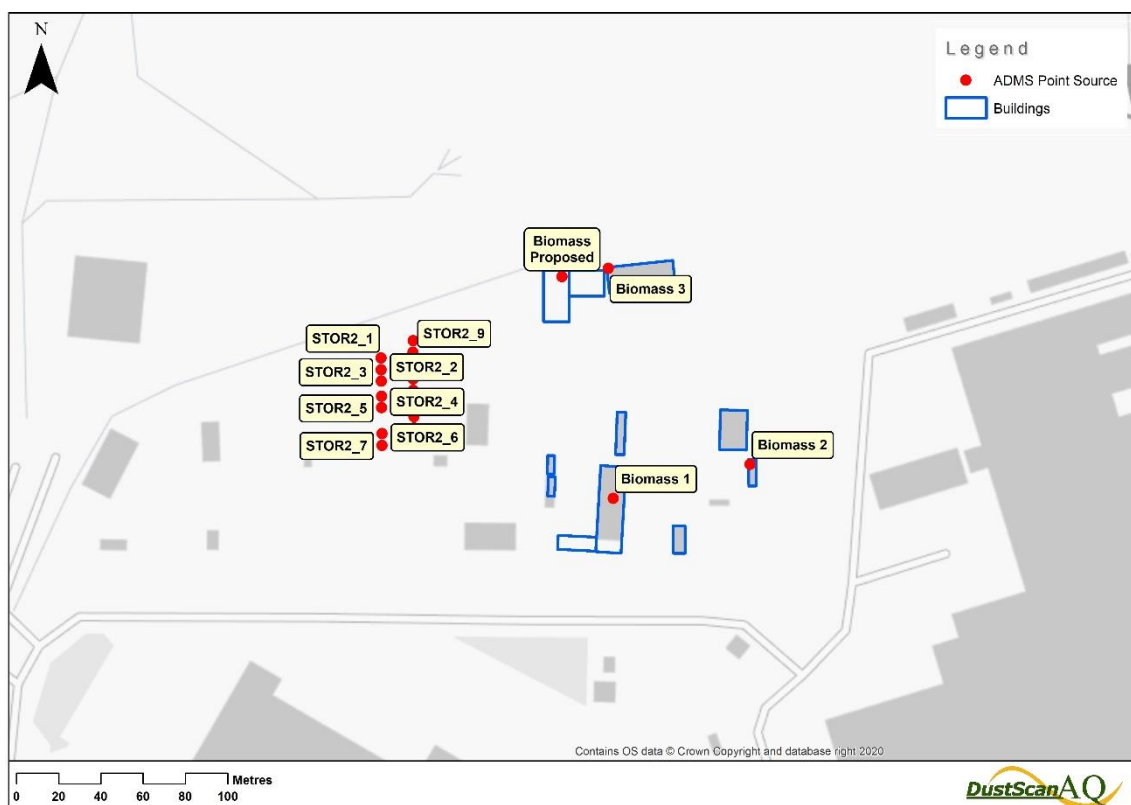


Figure 3.2: Modelled point sources and buildings

3.7 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 the buildings included in the dispersion model are set out below in Table 3.4. The positions of the modelled buildings are illustrated in Figure 3.3.

Table 3.4: Modelled building dimensions

Name	Shape	X (m)	Y (m)	Height (m)	Length (m)	Width (m)	Angle (°)
Building001	Rectangular	307910.9	208949.6	8.1	12.2	24.2	90
Building002	Rectangular	307925.3	208955.6	8.1	16.7	12.1	90.1
Building003	Rectangular	307951	208958.7	8.1	31.4	12.2	84
Building004	Rectangular	307994.7	208886.3	8.2	12.7	18.8	91.4
Building005	Rectangular	308003.7	208866	3.2	3.4	12.6	89.5
Building006	Rectangular	307969.1	208834.4	4.8	5.7	12.9	89.6
Building007	Rectangular	307936.6	208848.8	8.2	12	40.7	93.8

Name	Shape	X (m)	Y (m)	Height (m)	Length (m)	Width (m)	Angle (°)
Building008	Rectangular	307920.5	208832.7	8.2	6.7	17.8	183.5
Building009	Rectangular	307941.3	208884.6	6	4	20	92
Building010	Rectangular	307908.3	208869.8	5	3.2	8.7	91.4
Building011	Rectangular	307908.6	208859.6	5	3.2	9.2	92.2

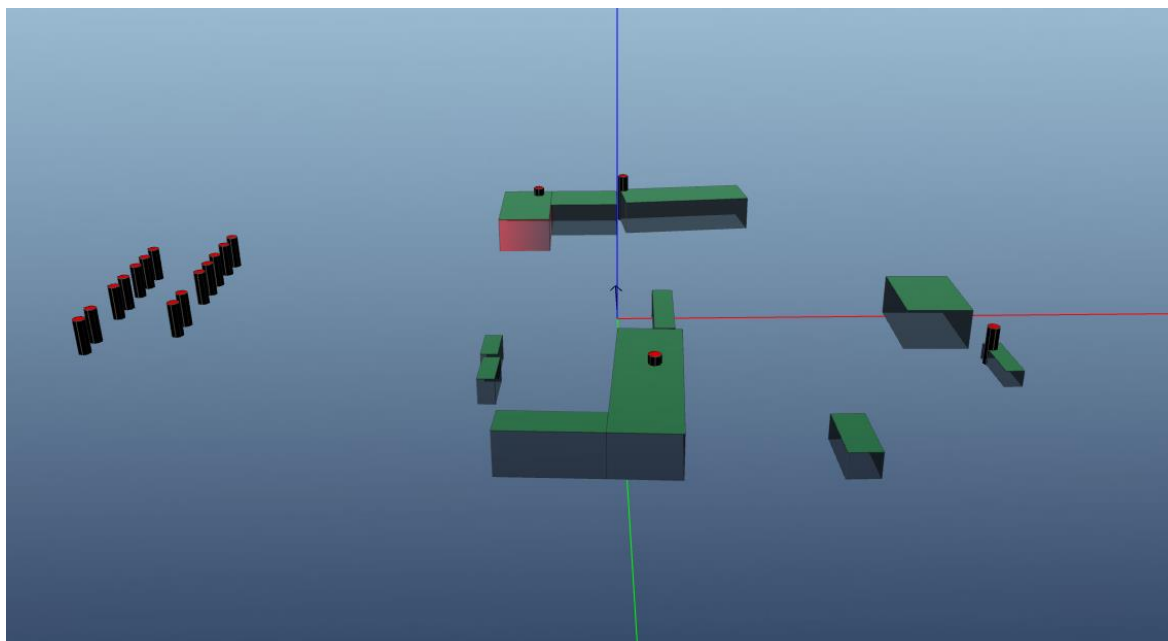


Figure 3.3: 3D rendering of modelled buildings and sources (view towards approximately north)

3.8 NO_x to NO₂ Relationship

As discussed in Section 1.3.1, emissions of NO_x will comprise contributions from both NO and NO₂. Air quality assessments are made against the concentrations of NO₂ as it is the regulated pollutant. However, combustion flue gases comprise 90-95% NO which, in time, will oxidise in the atmosphere into NO₂.

As NO₂ emissions from the engines are only one constituent of the total NO_x emissions, an allowance of the NO₂ proportion of NO_x needs to be made. The exact proportion of NO₂ in NO_x emissions from the development is unknown.

The Environment Agency and Defra provide the following guidance on the conversion of NO_x to NO₂²⁸:

“Emissions of nitrogen oxides should be recorded as nitrogen dioxide in your risk assessment (as nitrogen oxide converts to nitrogen dioxide over time):

²⁸ <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit>

- for short term PCs and PECs, assume only 50% of emissions of oxides of nitrogen convert to nitrogen dioxide in the environment
- for long term PCs and PECs, assume 100% of emissions of oxides of nitrogen convert to nitrogen dioxide”

3.9 Modelled 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.

In addition, gridded results were calculated. Grid dimensions are presented in Table 3.6 and shown spatially in Figure 3.5.

Table 3.5: Modelled receptor details

Receptor ID	X (m)	Y (m)	Z (m)
1	307365.36	209327.59	1.5
2	307015.49	209117.73	1.5
3	306840.53	208835.21	1.5
4	307344.22	208765.73	1.5
5	307684.42	208154.70	1.5
6	307984.30	208461.97	1.5
7	308934.68	208471.57	1.5
8	309360.82	208902.25	1.5

Table 3.6: Modelled grid details

	Min (m)	Max (m)	Resolution (m)
X	306413.67	309413.67	30
Y	207458.76	210458.76	30
Z	1.5	-	-

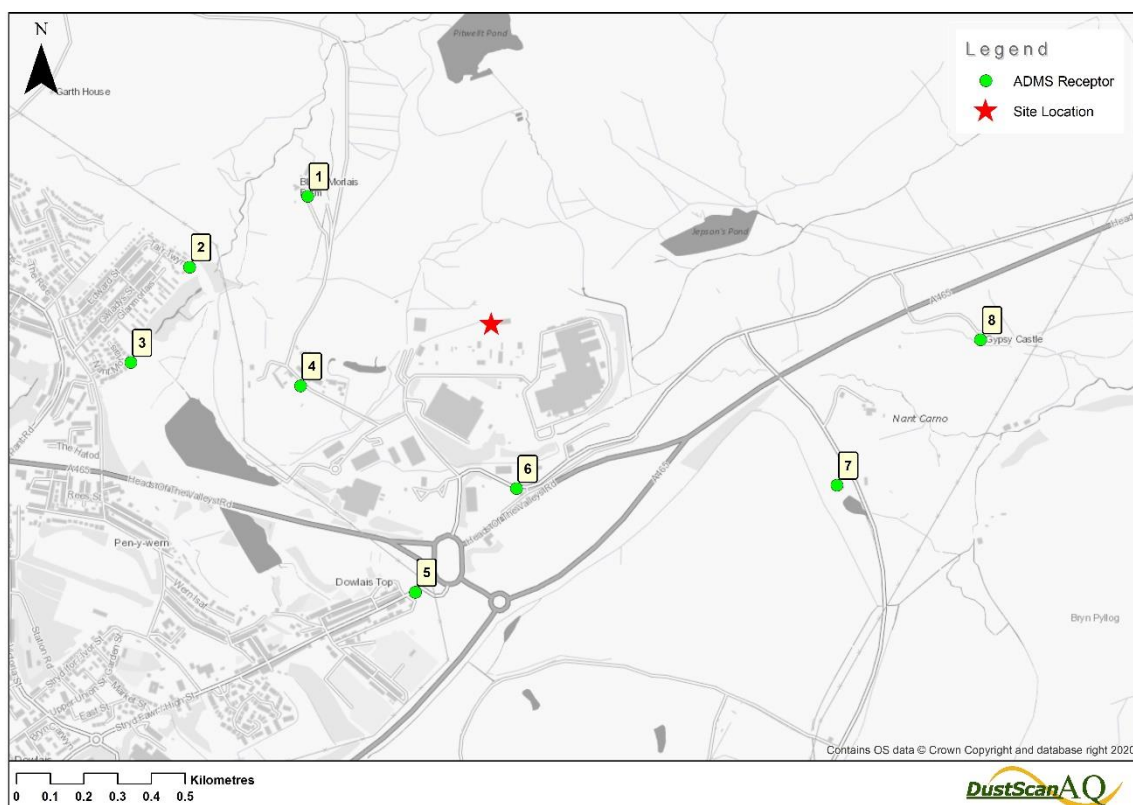


Figure 3.4: Modelled Human Receptors

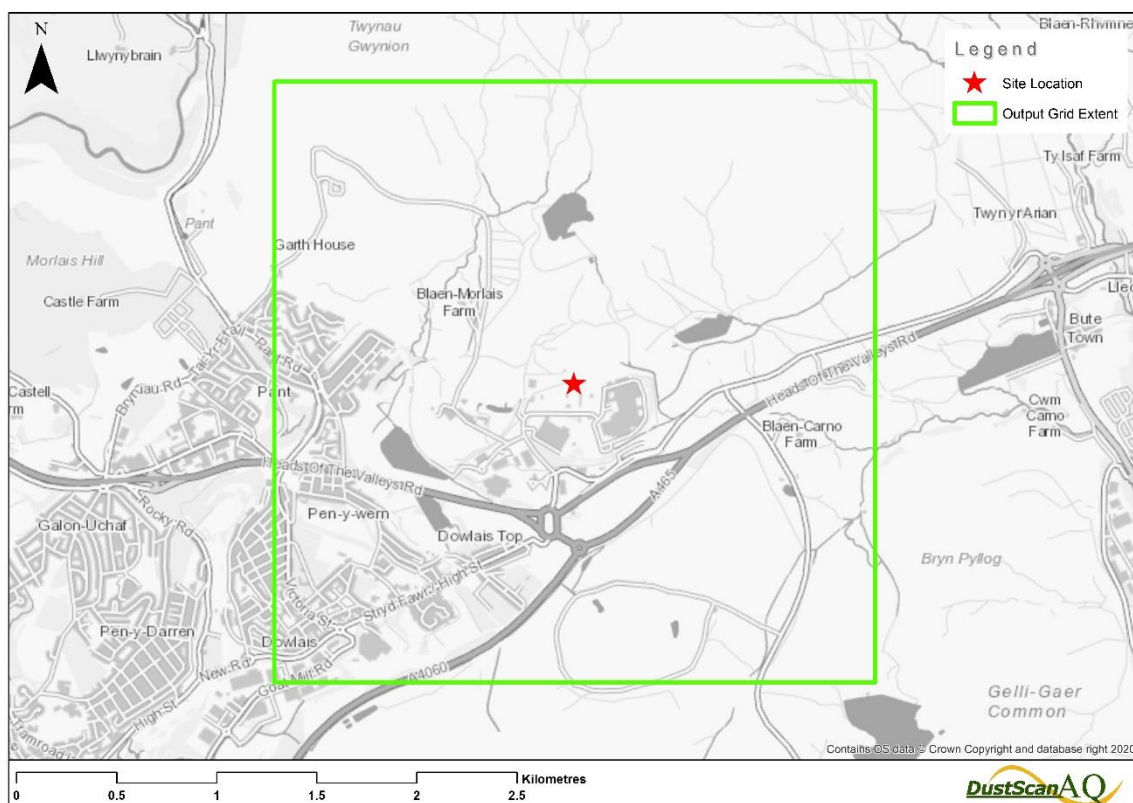


Figure 3.5: Modelled Grid Extent

3.10 Screening Criteria

Natural Resources Wales does not have specific air quality screening criteria for point sources; therefore, criteria from the Environment Agency and Defra are used in this assessment. The EA risk assessment guidance²⁹ 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)

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.

3.11 Significance Criteria

For the purposes of this assessment, the IAQM and EPUK (2017) criteria have been used for calculating the magnitude descriptors for predicted change in annual mean concentrations at individual receptors (Table 3.7). The IAQM recognise that professional

²⁹ <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit>

judgement is required in the interpretation of air quality assessment significance. Table 3.7 is intended to be used as a tool to assist with interpretation of the air quality assessment.

Table 3.7: Impact descriptors for predicted change in annual mean concentrations at individual receptors (Reproduced from EPUK and IAQM Guidance)

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

- Notes:
- ¹ AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.
 - ² The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The numbers are treated with their likely accuracy in order to avoid assumption of false level of precision. For example, Changes of 0%, i.e. less than 0.5% will be described as Negligible.
 - ³ The Table is only designed to be used with annual mean concentrations.
 - ⁴ Descriptors are used for individual receptors only; the overall significance is determined using professional judgement. For example, a 'moderate' adverse impact at one receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.
 - ⁵ When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme;' concentration for an increase.

3.12 Modelling Assumptions and Uncertainties

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

- Emission data and source parameters have been obtained from the project team and the Air Quality Assessment produced by RPS to support application P/18/0286. 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:

- Uncertainties regarding boiler emissions;
- Data uncertainty due to errors in input data, emission estimates, operational procedures, land use characteristics and meteorology;
- Uncertainties with meteorological data; and
- Simplifications made in the model algorithms or post processing of the data that describe atmospheric dispersion or chemical reactions.

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-6 (used for point sources) 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 – For point sources, emission rates have been calculated from data supplied by the project team. It has been conservatively assumed that all biomass boilers on the applicant's site run for every hour of the year.
- Receptor locations – most-affected human health receptors have been chosen;
- Defra background concentrations – 2026 Defra backgrounds have been used;
- Meteorological data – three years of meteorological data have been modelled to account for inter-year variation. For all pollutants and averaging periods, the presented results are the maximum from the three years of meteorological data.

4 Baseline Conditions

The following section sets out the baseline conditions in relation to air quality at the proposed development site. For the purpose of this assessment, data has been obtained from the MTCBC 2025 Air Quality Progress Report³⁰ and the Defra air quality resource website³¹.

The 2025 Air Quality Progress Report is prepared by MTCBC 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 in undertaking their 'Review and Assessment' work. This data is available to download from the Defra air quality resource website for NO_x, NO₂, PM₁₀ and PM_{2.5} for every 1 km X 1 km grid square for all local authorities. The current dataset is based on 2021 background data and future year projections are available for 2021 to 2040.

4.1 Air Quality Management Areas (AQMAs)

There is one declared AQMA within the jurisdiction of MTCBC, the Twynyrodyn Road AQMA. The AQMA is located within Merthyr Tydfil, 3.8 km to the southwest of the site.

4.2 NO₂

MTCBC did not undertake any automatic monitoring of NO_x or NO₂ within their jurisdiction in 2024. For the same year, MTCBC monitored NO₂ passively using diffusion tubes at 35 sites.

The closest MTCBC diffusion tube monitoring location to the site is S12, approximately 1.3 km southwest of the site in a roadside location.

Background annual mean NO₂ concentrations at the assessment site have been informed by NO₂ concentrations from the latest Defra background map. For this assessment, 2026 background concentrations have been used. Background concentrations used in this assessment are presented in the summary section below.

4.3 Particulate Matter

MTCBC did not undertake any automatic monitoring of PM₁₀ during 2024. Background PM₁₀ concentrations have therefore been taken from 2026 Defra background mapping which is deemed representative of background concentrations for the modelled area. Background concentrations used in this assessment are presented in the summary section below.

Similarly, for PM_{2.5}, 2026 Defra background mapping has informed background concentrations used in this assessment.

³⁰ Merthyr Tydfil County Borough Council, 2025. 'Merthyr Tydfil County Borough Council 2025 Air Quality Progress Report.

³¹ Department for Environmental Food and Rural Affairs. Accessible at: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021>

4.4 Summary of Baseline Conditions

Defra background concentrations from 2026 have been used in this assessment. Backgrounds have been assigned to modelled receptors according to their location. Background concentrations for short-term means have been factored according to EA guidance.

Table 4.1: Backgrounds assigned to modelled receptors

Pollutant	Averaging Period	Background Concentration at Modelled Receptors ($\mu\text{g}/\text{m}^3$)							
		1	2	3	4	5	6	7	8
NO ₂	Annual mean	4.57	4.57	4.98	4.57	4.57	4.57	4.22	4.33
	1-hour mean ^a	9.14	9.14	9.96	9.14	9.14	9.14	8.43	8.66
PM ₁₀	Annual mean	9.17	9.17	9.81	9.17	9.17	9.17	9.02	9.23
	24-hour mean ^b	10.82	10.82	11.58	10.82	10.82	10.82	10.65	10.89
PM _{2.5}	Annual	5.68	5.68	5.92	5.68	5.68	5.68	5.60	5.71

a. Annual mean *2

b. Annual mean *2*0.59

For the modelled grid, a background value of 9.96 $\mu\text{g}/\text{m}^3$ has been used for the NO₂ 1-hour mean. This is the maximum value within the modelled grid extent.

5 Potential Impacts

This section presents the results of the assessment of the impact of the proposed biomass boiler on sensitive human receptors.

5.1 Proposed Biomass Boiler Process Contribution

In Table 5.1 - Table 5.5 the process contribution from the proposed biomass boiler is screened for significance using the criteria set out in section 3.10. This assessment is carried out against the long and short-term AQOs for NO₂ and PM₁₀ and the long term AQO for PM_{2.5}. When assessing against PM₁₀ AQOs all particulate matter is assumed to be PM₁₀; when assessing against PM_{2.5} AQOs all particulate matter is assumed to be PM_{2.5}.

The presented concentrations are the maximum across three years of modelled meteorological data.

Table 5.1: NO₂ annual mean process contribution screening

Receptor ID	AQO (µg/m ³)	Max PC (µg/m ³)	Max PC as % of AQO	Is PC Potentially Significant?
1	40	0.06	0.15	No
2	40	0.05	0.12	No
3	40	0.04	0.09	No
4	40	0.12	0.29	No
5	40	0.05	0.13	No
6	40	0.10	0.25	No
7	40	0.05	0.13	No
8	40	0.04	0.11	No

Table 5.2: NO₂ 1-hour mean process contribution screening (99.79th percentile)

Receptor ID	AQO (µg/m ³)	Max PC (µg/m ³)	Max PC as % of AQO	Is PC Potentially Significant?
1	200	1.76	0.88	No
2	200	1.40	0.70	No
3	200	0.96	0.48	No
4	200	1.84	0.92	No
5	200	1.28	0.64	No
6	200	2.10	1.05	No
7	200	1.39	0.70	No
8	200	0.57	0.29	No

Table 5.3: PM₁₀ annual mean process contribution screening

Receptor ID	AQO (µg/m ³)	Max PC (µg/m ³)	Max PC as % of AQO	Is PC Potentially Significant?
1	40	0.01	0.03	No
2	40	0.01	0.02	No
3	40	0.01	0.02	No
4	40	0.02	0.05	No
5	40	0.01	0.02	No
6	40	0.02	0.05	No
7	40	0.01	0.02	No
8	40	0.01	0.02	No

Table 5.4: PM₁₀ 24-hour mean process contribution screening (90.41st percentile)

Receptor ID	AQO (µg/m ³)	Max PC (µg/m ³)	Max PC as % of AQO	Is PC Potentially Significant?
1	50	0.04	0.08	No
2	50	0.03	0.06	No
3	50	0.03	0.05	No
4	50	0.09	0.18	No
5	50	0.04	0.07	No
6	50	0.07	0.15	No
7	50	0.03	0.06	No
8	50	0.02	0.04	No

Table 5.5: PM_{2.5} annual mean process contribution screening

Receptor ID	AQO (µg/m ³)	Max PC (µg/m ³)	Max PC as % of AQO	Is PC Potentially Significant?
1	20	0.01	0.05	No
2	20	0.01	0.04	No
3	20	0.01	0.03	No
4	20	0.02	0.10	No
5	20	0.01	0.05	No
6	20	0.02	0.09	No
7	20	0.01	0.05	No

Receptor ID	AQO ($\mu\text{g}/\text{m}^3$)	Max PC ($\mu\text{g}/\text{m}^3$)	Max PC as % of AQO	Is PC Potentially Significant?
8	20	0.01	0.04	No

The above tables, Table 5.1 - Table 5.5, demonstrate that for all modelled pollutants and their relevant AQOs, the process contribution is not significant at the location of modelled human receptors.

The Welsh Government plans to reduce the $\text{PM}_{2.5}$ annual mean AQO to $10 \mu\text{g}/\text{m}^3$. Using the EA screening methodology, the $\text{PM}_{2.5}$ process contribution would be insignificant when compared to this target.

Figure 5.1 below presents the 99.79th percentile NO_2 1-hour mean process contribution contour. The contour values are the maximum over a modelled period of three years. The process contribution as neighbouring employment sites is considered to be not significant.

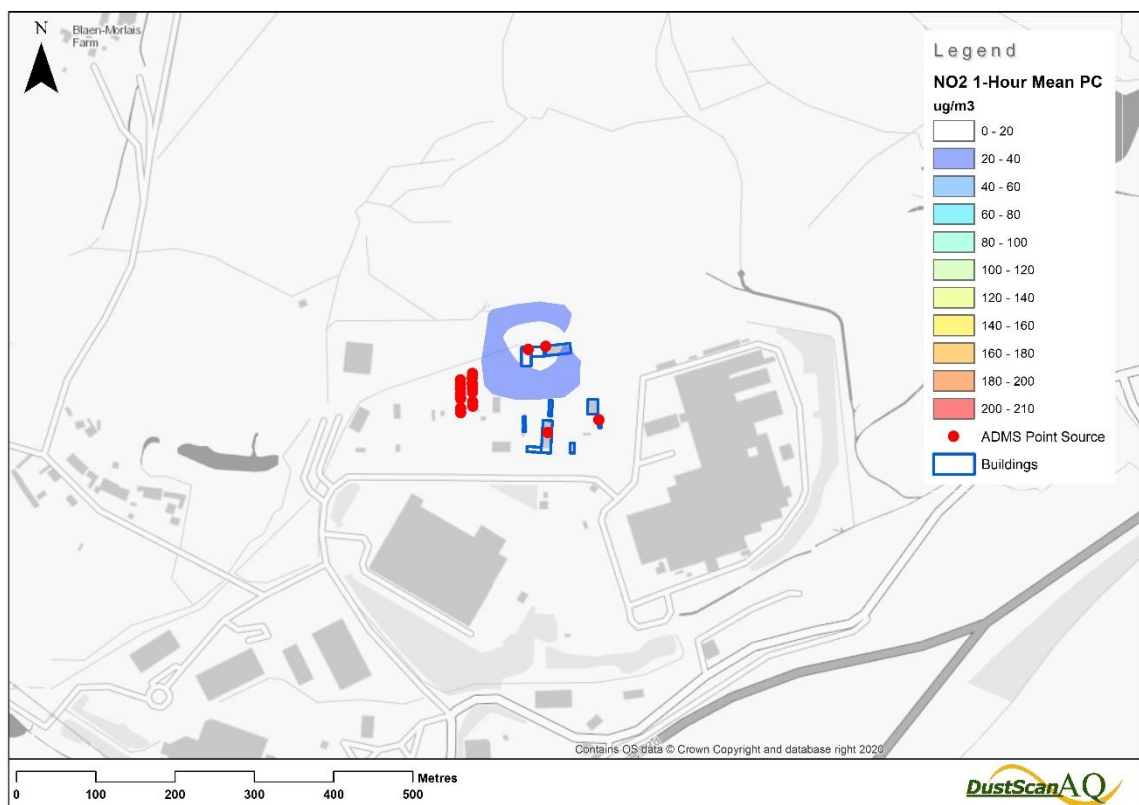


Figure 5.1: 99.79th percentile NO_2 1-Hour Mean Process Contribution Contour (2022 Met)

5.2 Cumulative Impacts

This section presents results for both the Do Minimum and Do Something scenarios. Impact descriptors are assigned according to IAQM guidance set out in section 3.11.

Table 5.6: NO₂ annual mean – IAQM impact descriptors

Receptor ID	Do Minimum (µg/m ³)	Do Something (µg/m ³)	Concentration change (µg/m ³)	Long term average concentration at receptor	Impact Descriptor
1	4.97	5.04	0.06	75% or less of AQAL	Negligible
2	4.86	4.91	0.05	75% or less of AQAL	Negligible
3	5.25	5.28	0.04	75% or less of AQAL	Negligible
4	5.58	5.69	0.12	75% or less of AQAL	Negligible
5	5.00	5.05	0.05	75% or less of AQAL	Negligible
6	5.45	5.55	0.10	75% or less of AQAL	Negligible
7	4.59	4.64	0.05	75% or less of AQAL	Negligible
8	4.67	4.71	0.04	75% or less of AQAL	Negligible

Table 5.7: PM₁₀ annual mean – IAQM impact descriptors

Receptor ID	Do Minimum (µg/m ³)	Do Something (µg/m ³)	Concentration change (µg/m ³)	Long term average concentration at receptor	Impact Descriptor
1	9.19	9.20	0.01	75% or less of AQAL	Negligible
2	9.19	9.20	0.01	75% or less of AQAL	Negligible
3	9.83	9.83	0.01	75% or less of AQAL	Negligible
4	9.21	9.23	0.02	75% or less of AQAL	Negligible
5	9.20	9.20	0.01	75% or less of AQAL	Negligible

Receptor ID	Do Minimum (µg/m³)	Do Something (µg/m³)	Concentration change (µg/m³)	Long term average concentration at receptor	Impact Descriptor
6	9.23	9.25	0.02	75% or less of AQAL	Negligible
7	9.05	9.06	0.01	75% or less of AQAL	Negligible
8	9.25	9.26	0.01	75% or less of AQAL	Negligible

Table 5.8: PM_{2.5} annual mean – IAQM impact descriptors

Receptor ID	Do Minimum (µg/m³)	Do Something (µg/m³)	Concentration change (µg/m³)	Long term average concentration at receptor	Impact Descriptor
1	5.70	5.71	0.01	75% or less of AQAL	Negligible
2	5.69	5.70	0.01	75% or less of AQAL	Negligible
3	5.93	5.94	0.01	75% or less of AQAL	Negligible
4	5.72	5.74	0.02	75% or less of AQAL	Negligible
5	5.70	5.71	0.01	75% or less of AQAL	Negligible
6	5.73	5.75	0.02	75% or less of AQAL	Negligible
7	5.62	5.63	0.01	75% or less of AQAL	Negligible
8	5.73	5.74	0.01	75% or less of AQAL	Negligible

For all modelled receptors and pollutants presented in Table 5.6 - Table 5.8 the impact is described as negligible.

Figure 5.2 below presents the 99.79th percentile NO₂ 1-hour mean Predicted Environmental Concentration (PEC) contour. Contours for 2022 are presented as this year of modelling produced the highest maximum concentration across the modelled grid. The contours show that short-term NO₂ concentrations are dominated by the STOR plant to the west of the site when it is in operation. The contours also show a small area of exceedance, but this is in a location where the AQO is not applicable. It is also worth noting that these results are very conservative for the following reasons:

- All sources are modelled as running for every hour of the year. The contours represent the 18th highest value of those modelled hours. For the majority of hours, all sources will not be in operation at the same time. When they are all in operation, it is unlikely that this will coincide with the worst meteorological conditions for dispersion. Therefore, the results presented are a worst-case that is unlikely in reality.

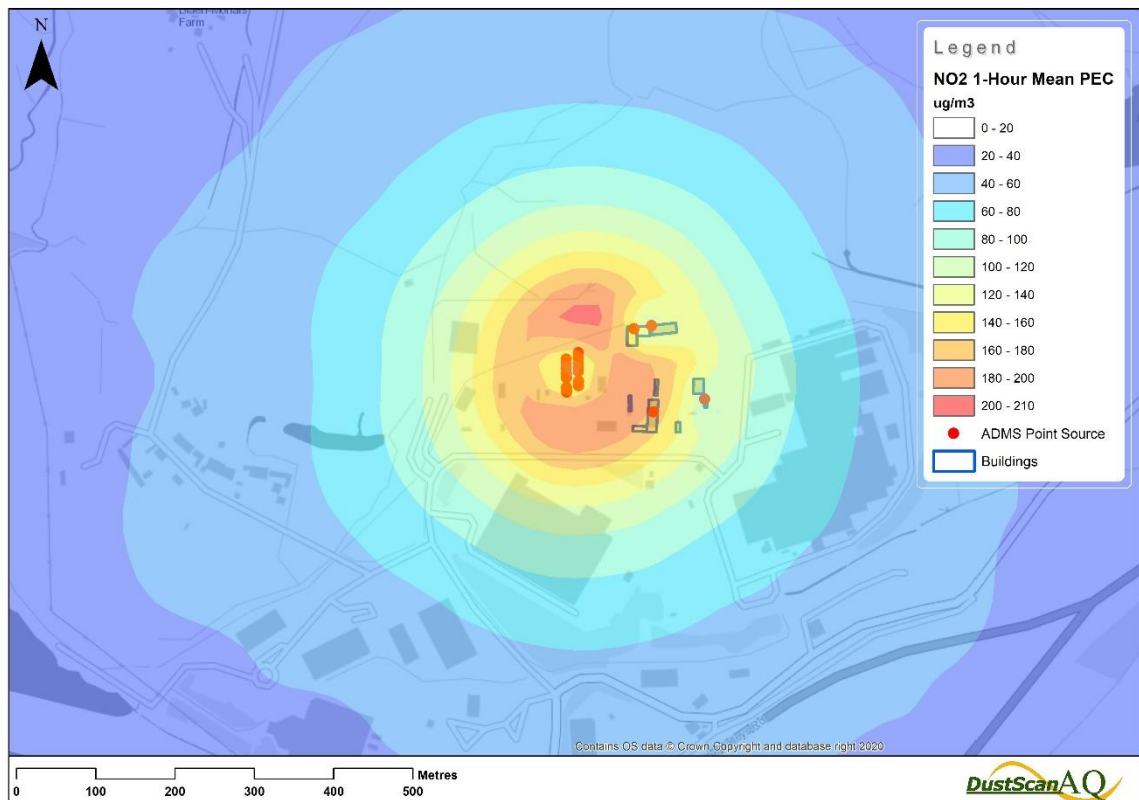


Figure 5.2: 99.79th percentile NO₂ 1-Hour Mean Predicted Environmental Concentration Contour (2022 Met)

5.3 Determination of Significance

Comparison against EA criteria determines that for all pollutants and averaging periods modelled, the process contribution from the proposed biomass boiler is not significant. Similarly, the impact is considered negligible for all modelled pollutants against their annual mean objectives using IAQM significance criteria. For all modelled pollutants and averaging periods, the PEC is below the relevant AQO. Therefore, the air quality impact of the operation of the proposed biomass boiler is assessed as not significant. The proposed stack height is considered acceptable.

6 Mitigation Measures

There are no further mitigation measures proposed since the assessment demonstrates that with the proposed biomass boiler the air quality objectives will be met.

7 Conclusion

This report provides an assessment of the impacts associated with the proposed installation and operation of a biomass boiler at Pengarnddu Industrial Estate, Dowlais, Merthyr Tydfil.

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 Pengarnddu Industrial Estate.

Modelling has been undertaken using data provided by Merthyr Biomass Ltd, Technia, the Air Quality Assessment produced by RPS to support application P/18/0286, 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.

The proposed development will not result in a significant worsening of local air quality. The proposed stack height is considered acceptable. No further mitigation is recommended.

It can therefore be concluded that the proposed development would not result in significant impacts on air quality is therefore not considered to conflict with national, regional and local air quality planning policy.

Appendix A: RHI 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 * <i>*if different, include details of both</i>	Testing Laboratory: Steiresche Gas-Wärme GmbH, A-8600 Bruck/Mur, Hochfeldgasse 28 Certificate Issuer: Exova Catalyst, Unit C6 Emery Court, the embankment Business Park, Heaton Mersey, Stockport, SK4 3GL
b) Name and signature of the person authorised by the testing laboratory to issue the certificate	Name: James Eldridge, Deputy Regional Manager – Exova Catalyst  Unit C6, Emery Court The Embankment Business Park Heaton Mersey, Stockport SK4 3GL T: 0161 432 3285 E: info@cat-env.com Company Registration No: SC070429 Signature: 
c) Date of issue of this certificate, together with certificate reference number for this certificate <i>*Please see Note A</i>	Date: 04/12/2018 Certificate reference number: CAT-4611-RHI Herz RRK 950-1300kW Boilers
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 <i>(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)</i>	Date: Not applicable as testing date was 21st January 2013. Accreditation number: N/A

2. PLANT - Please see Note B	
a) Name of the plant tested	Herz RRK 1000 – MZA 400
b) Model of the plant tested* <i>*Please ensure this is the same as in the manufacturer's documentation and boiler nameplate</i>	Herz RRK 1000
c) Manufacturer of the plant tested	Herz Energietechnik GmbH

d) Installation capacity* of the tested plant in kilowatts (kW) <i>*The total installed peak heat output capacity</i>	950kW
e) Is the plant a <u>manually stoked, natural draught</u> 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 <i>*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.</i>	21/01/2013 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. <i>*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.</i>	RRK 1000 – 950kW RRK 1000 – 990kW RRK 1000 – 995kW RRK 1000 – 999kW RRK 1000 – 1200kW RRK 1000 – 1300kW

3. FUELS

a) Types of fuels used when testing <i>(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').</i>	Wood Chips (EN14961-4, 2011 Class B2)
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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.

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) <i>(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'.</i>	Wood Chips (EN14961-4, 2011 Class A1, A2, B1) including Grade A recycled wasted wood, max 50% moisture content
c) Moisture content of the fuel used during testing. (If multiple fuel types have been tested state all.)	<50%
d) Maximum allowable moisture content* of fuel that can be used with the certified plant(s) that ensures RHI emission limits are not exceeded. <i>*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.</i>	Woodchip – (EN14961-4, 2011) i) Class A1 – 25% ii) Class A2 – 35% iii) Class B1 & B2 – <50%

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? <i>*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</i>	Not applicable
b) Was the testing carried out in accordance with <u>all</u> 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.	i) Yes ii) Yes iii) Yes

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.

c) Please confirm the plant was tested at $\geq 85\%$ of the installation capacity of the plant.	Yes – Full Load
d) Please confirm the test shows that emissions from the plant were no greater than 30 g/GJ PM and 150 g/GJ NO _x .	Yes
e) Measured* emissions of PM in g/GJ net heat input <i>*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.</i>	19.3g/GJ
f) Measured* emissions of NO _x in g/GJ net heat input <i>*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.</i>	109.6g/GJ

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.