

Air Quality, Carbon & Energy Technical Note

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1. Introduction

This technical note has been prepared by Ove Arup and Partners Ltd (Arup) to support a planning application for the installation of a generator compound containing two diesel-powered standby generators and two diesel fuel tanks at Fairfield General Hospital, Bury. The standby generators are part of the enabling works for the planned future works for the wider Fairfield General Hospital masterplan strategy.

The location of the proposed generators in relation to the Fairfield General Hospital are shown on Figure 1.

The two standby generators to be installed will be used as a backup electricity source for Fairfield Hospital for emergency use only and will be tested once per year at 100% load.

This technical note provides an overview of relevant legislation, policy and guidance, baseline air quality in the area, identifies nearby sensitive receptors, and provides a qualitative review of potential air quality, carbon and energy impacts arising from the testing of the generators.

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Figure 1: Location of Fairfield Hospital and Proposed Generators



2. Legislation, policy and guidance

2.1 Legislation

2.1.1 Environment Act (2021)

The Environment Bill became an Act¹ (law) in November 2021. The Environment Act 2021 amends the Environment Act 1995². It also amends the Clean Air Act 1993³ to give local authorities more power at reducing local pollution, particularly that from domestic burning. It also amends the Environmental Protection Act 1990⁴ to reduce smoke from residential chimneys by extending the system of statutory nuisance to private dwellings.

The following sections of the Environment Act 1995 have been transposed into the Environment Act 2021.

¹ Environment Act 2021. Available at: <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>. Accessed [Accessed April 2024].

² Environment Act 1995, Chapter 25, Part IV Air Quality [Accessed April 2024]

³ Clean Air Act 1993. Available at: <https://www.legislation.gov.uk/ukpga/1993/11/contents>. [Accessed April 2024]

⁴ Environmental Protection Act 1990. Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents>. [Accessed April 2024]

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- For the Secretary of State to develop, implement and maintain an Air Quality Strategy. This includes the statutory duty, also under Part IV of the Environment Act 1995, for local authorities to undergo a process of local air quality management and declare an Air Quality Management Area (AQMA) where pollutant concentrations exceed the national air quality standards. Where an AQMA is declared, the local authority needs to produce an Air Quality Action Plan (AQAP) which outlines the strategy for improving air quality in these areas.
- The Act will implement key parts of the government's Clean Air Strategy and include targets for tackling air pollution in the UK;
- for the Secretary of State to publish a report reviewing the Air Quality Strategy every five years;
- for the Office for Environmental Protection to be established to substitute the watchdog function previously exercised by the European Commission;
- for local authorities' powers to be extended under the current Local Air Quality Management framework, including responsibilities to improve local air quality and to reduce public exposure to excessive levels of air pollution;
- for "air quality partners" to have a duty to share responsibility for dealing with local air pollution among public bodies; and
- to introduce a new power for the government to compel vehicle manufacturers to recall vehicles and non-road mobile machinery if they are found not to comply with the environmental standards that they are legally required to meet.

2.1.2 Air Quality Standards Regulations 2010 (Amended in 2016)

The Air Quality Standards Regulations 2010 (amended in 2016)⁵ define the policy framework for 12 ambient air pollutants known to have harmful effects on human health or the natural environment. The Secretary of State for the Environment has the duty of ensuring compliance with the air quality limit values (pollutant concentrations not to be exceeded by a certain date).

Some pollutants have standards expressed as annual average concentrations due to the chronic way in which they affect health or the natural environment, i.e. effects occur after a prolonged period of exposure to elevated concentrations. Other pollutants have standards expressed as 24-hour, 1-hour or 15-minute average concentrations due to the acute way in which they affect health or the natural environment, i.e. after a relatively short period of exposure. Some pollutants have standards expressed in terms of both long and short-term concentrations. Air quality limit values and objectives are quality standards for clean air. Therefore, in this assessment, the term 'air quality standard' has been used to refer to the national limit values.

⁵ The Air Quality Standards (Amendment) Regulations 2016, SI 2016/1184 [Accessed April 2024]

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Table 1: Air Quality Standards

Pollutant	Averaging Period	Limit value / objective
Nitrogen dioxide (NO ₂)	Annual mean	40µg/m ³
	1-hour mean	200µg/m ³ ^[1]
Particulate matter (PM ₁₀)	Annual mean	40µg/m ³
	24-hour mean	50µg/m ³
Fine particulate matter (PM _{2.5})	Annual mean	20µg/m ³
		12µg/m ³ ^[2]
		10µg/m ³ ^[2]

[1] not to be exceeded more than 18 times a year (99.79th percentile)
 [2] The Environmental Targets (Fine Particular Matter) (England) Regulations 2023 updated in 2023, to state that the “the annual mean level of PM_{2.5} in ambient air must be equal to or less than 10µg/m³ (“the target level”)” by 31st December 2040⁶. The Environmental Improvement Plan (2023)⁷ sets an interim target of 12µg/m³, to be achieved by 31st January 2028.
 Due to the timescales of the Fairfield General Hospital masterplan, this report has considered the interim target of 12µg/m³.

2.1.3 Environmental Permitting Regulations

Combustion activities are regulated under The Environmental Permitting (England and Wales) Regulations 2016 (EPR)⁸. The regulations enact both the Industrial Emission Directive and the Medium Combustion Plant Directive (MCPD) in England and operators undertaking any of the activities identified under these regulations require an environmental permit to carry out these activities.

2.1.3.1 Medium Combustion Plant Directive (MCPD)

In November 2015, the European Commission published the Medium Combustion Plant (MCP) Directive 2015/2193⁹ on the limitation of emissions of certain pollutants into the air from MCPs.

The MCPD regulates pollutant emissions from the combustion of fuels in plants with a rated thermal input equal to, or greater than, 1 megawatt (MWth) and less than 50 MWth.

The MCPD regulates emissions of sulphur dioxide (SO₂), nitrogen oxides (NO_x) and dust to the air only, with the aim of reducing those emissions and the risks to human health and the environment they may cause. It also lays down rules to monitor emissions of carbon monoxide (CO) but does not set an emission limit value (ELV) for CO.

⁶ Defra, 2023. Chief Planners Newsletter. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1140170/03_Chief_Planners_Newsletter_March_2023.pdf [Accessed April 2024]

⁷ Defra, 2023. Environmental Improvement Plan. Available at: <https://www.gov.uk/government/publications/environmental-improvement-plan> [Accessed April 2024].

⁸ The Environmental Permitting (England and Wales) Regulations 2016, SI2016/1154.

⁹ Directive (EU) 2015/2193 of the European Parliament and the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants

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It is considered that the proposed generators would fall under the MCPD, therefore an MCP permit from the Environment Agency (EA) is likely to be required to operate. Based on the standby nature of the generators and the estimated annual run time however, it is likely that the plant will be exempt from meeting the relevant MCP ELVs.

Further information on this should be sought from the EA and is outside of the scope of this assessment.

2.1.4 Climate Change Act (2008 – 2050 Target Amendment)

The UK Climate Change Act 2008 sets a target for the year 2050 for the reduction of greenhouse gas emissions, with the UK carbon account for the year 2050 be at least 100% lower than the 1990 baseline. The 1990 baseline means the aggregate amount of net UK emissions of carbon dioxide for that year, and net UK emissions of each of the other targeted greenhouse gases for the year that is the base year for that gas.

2.2 Policy

2.2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)¹⁰ was updated in December 2023 with the purpose of planning to achieve sustainable development. Paragraph 186 of the NPPF on air quality states that:

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

In addition, paragraph 105 states that:

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

Paragraph 174 discusses how planning policies and decisions should contribute to and enhance the natural and local environment. In relation to air quality, the NPPF notes that this can be achieved by:

“e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.”

¹⁰ Ministry of Housing, Communities and Local Government (2023) National Planning Policy Framework [Accessed April 2024]

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2.2.2 Planning Practice Guidance (2019)

Planning Practice Guidance (PPG)¹¹ on various topics, including air quality was developed in order to support the NPPF. The guidance provides a concise outline as to how air quality should be considered in order to comply with the NPPF and states when air quality is considered relevant to a planning application. This includes factors such as changes in traffic volumes, vehicle speeds, congestion or traffic composition, the introduction of new point sources of air pollution, exposure of people to existing sources of air pollutants, and the potential to give rise to air quality impacts at nearby sensitive receptors.

2.2.3 Clean Air Strategy

The Department for Environment, Food and Rural Affairs (Defra) Clean Air Strategy¹² was published in 2019 and sets targets for improving air quality across the country. It includes actions for reducing emissions from various sources, such as transport, domestic activities, farming and industry. There is also a long-term target for reducing population exposure to PM_{2.5} concentrations to meet the World Health Organisation's (WHO) target of 10µg/m³ as an annual mean. In particular, the Clean Air Strategy states:

“New legislation will create a stronger and a more coherent framework for action to tackle air pollution. This will be underpinned by new England-wide powers to control major sources of air pollution, in line with the risk they pose to public health and the environment, plus new local powers to take action in areas with an air pollution problem. These will support the creation of Clean Air Zones to lower emissions from all sources of air pollution, backed up with clear enforcement mechanism.”

2.2.4 Local Air Quality Management Policy and Technical Guidance

The 2016 policy guidance note from Defra, LAQM.PG(16)¹³, provides additional guidance on the links between transport and air quality and guidance on the links between air quality and the land-use planning system. It summarises the main ways in which the land-use planning system can help deliver compliance with the air quality standards. This guidance is relevant to any external organisations who may wish to engage with the local authority to assist in the delivery of their statutory duties on managing air quality.

The LAQM Technical Guidance, TG(22)¹⁴ is designed to support local authorities in carrying out their duties to review and assess air quality in their area. It provides detailed guidance on how to assess the impact of measures using existing air quality tools.

2.2.5 Net Zero Strategy

The UK Government's main climate change policy document is the Net Zero Strategy (Build Back Greener), published October 2021 (updated April 2022). It set out policies and proposals for decarbonising all sectors of the UK economy to meet the Government's net zero target by 2050. The policies within the strategy were updated in March 2023 with a suite of publications under the policy paper, Powering Up Britain that included the Powering Up Britain: Net Zero Growth Plan.

The UK Government's Carbon Budget Delivery Plan (March 2023) fulfils the statutory duties under the Climate Change Act 2008. The Plan estimates that its quantified proposals and policies will give over 100% of savings required to meet Carbon Budget 4 and 5 and 97% of the savings required to meet Carbon Budget 6.

¹¹ Department for Communities and Local Government (2019): 'Planning Practice Guidance: Air Quality'

¹² Defra (2019) Clean Air Strategy 2019.

¹³ Defra (2016) Local Air Quality Management Policy Guidance PG (16).

¹⁴ Defra (2022) Local Air Quality Management Technical Guidance TG (22).

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2.3 Permitting Guidance

2.3.1 Integrated Pollution Prevention and Control (IPPC) Horizontal Guidance Note H1

The IPPC H1 guidance¹⁵ was produced by the EA for England and Wales in collaboration with the Scottish Environment Protection Agency (SEPA) and the Northern Ireland Environment and Heritage Service (EHS). The IPPC is a regulatory system that employs an integrated approach to control the environmental impacts of certain industrial activities. The purpose of the H1 guidance note is to provide supplementary information relevant to all sectors, for the appraisal of Best Available Techniques (BAT) and to carry out an appropriate environmental assessment of the overall impact of the emissions resulting from a proposed installation.

More recently the EA has revised the H1 guidance and has developed a web-based version¹⁶, with the latest revision date being December 2023.

2.4 Air Quality Assessment Guidance

2.4.1 Guidance on Land-use Planning and Development Control

The 2017 Land-Use Planning & Development Control guidance document¹⁷ produced by Environmental Protection UK (EPUK) and the IAQM provides a framework for professionals operating in the planning system to provide a means of reaching sound decisions, with regard to the air quality implications of development proposals.

The document provides guidance on when air quality assessments are required by providing screening criteria regarding the size of a development, changes to traffic flows/composition energy facilities or combustion processes used.

Table 6.2 in the guidance provides the following criteria for combustion plant associated with emergency generators:

- Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/s¹⁸ is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion;
- In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates; and
- Where existing NO₂ concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

¹⁵ IPPC H1 (2003) Environmental Assessment and Appraisal of BAT

¹⁶ EA (2023) Air emissions risk assessment for your environmental permit Available at: <https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit> [Accessed April 2024]

¹⁷ EPUK and IAQM (2017) Land-use Planning & Development Control: Planning for Air Quality, (v1.2).

¹⁸ As a guide, the 5 mg/s criterion equates to a 450 kW ultra low NO_x gas boiler or a 30kW CHP unit operating at <95mg/Nm³.

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2.4.2 Places for Everyone Joint Development Plan (2024)

The Places for Everyone Plan¹⁹ was produced by the local authorities within Greater Manchester, including Bury Council. The document provides local plans and policies to create the conditions for inclusive economic growth, provide opportunities for provision of housing and protect and enhance the natural environment.

Policy JP-S5: Clean Air contains the policies relevant to air quality. This policy includes specific measures to support improvements in air quality, focusing particularly on sensitive areas (residential areas, areas where children live and play, the green infrastructure network, and where other air quality targets are not met). A summary of the measures relevant to the proposed generators at Fairfield Hospital is provided below:

- Determining planning applications with regard to the most recent development and planning control guidance documents;
- Requiring applications for developments that could have an adverse impact on air quality to submit relevant air pollution data so that adverse impacts on air quality can be fully assessed and development only permitted where they are acceptable and/or suitable mitigation can be provided; and
- Restricting developments that would generate significant point source pollution such as some types of industrial activity and energy generation.

Policy JP-S2: Carbon & Energy contains the policies relevant to carbon & energy. This policy includes specific measures to support the aim of delivering a carbon neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions. A summary of the measures is provided below:

- An expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable:
 - a. Be net zero carbon.

Development proposals should set out how this has been achieved in an energy statement in accordance with the energy hierarchy, which in order of importance seeks to:

- i. Minimise energy demand;
- ii. Maximise energy efficiency;
- iii. Use renewable energy;
- iv. Use low carbon energy; and
- v. Utilise other energy sources.

From 2025 any residual carbon emissions that cannot be fully mitigated on-site should be offset, in agreement with the relevant local planning authority through a financial contribution to a carbon offset fund.

¹⁹ Places for Everyone Joint Development Plan Document for Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside and Wigan 2022 to 2039 (2024) Available at: <https://www.greatermanchester-ca.gov.uk/media/9578/places-for-everyone-joint-development-plan-document.pdf> [Accessed April 2024]

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3. Baseline Conditions and Receptors

Existing or baseline ambient air quality refers to the concentration of relevant substances that are already present in the environment. These are present from various sources, such as industrial processes, commercial and domestic activities, traffic and natural sources.

A desk-based review of the following data sources has been undertaken to determine air quality conditions around Fairfield Hospital:

- The EA website²⁰;
- The Defra Local Air Quality Management website²¹; and
- Greater Manchester Combined Authority 2022 Air Quality Annual Status Report (ASR)²² (this is the most recent ASR available at the time of writing).

The review identified the main sources of air pollution, local air quality monitoring data and local background pollutant concentrations.

This baseline assessment uses a study area of 2km from the location of the proposed generators, which is considered to provide sufficient data to assess baseline conditions.

3.1 Sources of air pollution

3.1.1 Industrial Processes

Industrial air pollution sources are regulated through a system of operating permits or authorisations, requiring stringent emission limits to be met, and ensuring that any releases to the environment are minimised or rendered harmless. Regulated (or prescribed) industrial processes are classified as Part A(1), A(2), Part B or MCP processes, and are regulated through the Pollution Prevention and Control (PPC) system^{23,24}. The larger, more polluting processes are regulated by the EA and the smaller, less polluting ones by local authorities. Local authorities focus on regulation for emissions to air, whereas the EA regulates emissions to air, water and land, including the air emissions focussed MCP permits.

There are no large Part A(1) processes with relevant emissions to air within 2km of the proposed generators that are listed on the EA website²⁵. The impact of other industrial processes further from Fairfield Hospital are assumed to be represented in the background concentrations used in this assessment.

²⁰ Environment Agency website, Available at: <https://environment.data.gov.uk/public-register/view/search-industrial-installations> [Accessed April 2024].

²¹ Defra, Air Quality Management Areas website, Available at: <https://uk-air.defra.gov.uk/aqma/list> [Accessed April 2024].

²² Greater Manchester Combined Authority (2023) 2022 Air Quality Annual Status Report. Available at: https://assets.ctfassets.net/tlpgbv1k6h2/3eJDZpHcCKNK0ZO7TcUkI/3363e762b28868a832ab2200286a4841/Greater_Manchester_Air_Quality_Annual_Status_Report_2022.pdf [Accessed April 2024]

²³ Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control).

²⁴ The Environmental Permitting (England and Wales) (Amendment) Regulations 2013, SI 2013/390.

²⁵ Environment Agency. Environmental Permitting Regulations – Installations. Available at: <https://environment.data.gov.uk/public-register/view/search-industrial-installations> [Accessed April 2024]

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3.2 Local Air Quality

3.2.1 Air Quality Management Areas

The Environment Act 2021²⁶ requires local authorities to review and assess air quality with respect to the objectives for the pollutants specified in the National Air Quality Strategy. Where objectives are not predicted to be met, local authorities must declare the area as an Air Quality Management Area (AQMA). In addition, local authorities are required to produce an Air Quality Action Plan (AQAP) that includes measures to improve air quality within the AQMA.

Fairfield Hospital (including the location of the proposed generators) is not located within an AQMA but is 1.1km east of the Bury AQMA, which was declared by Bury Council in 2007 due exceedances of the NO₂ annual mean air quality standard (40µg/m³). In 2016, the Bury AQMA was incorporated into the Greater Manchester Combined Authority AQMA.

3.2.2 Local Monitoring

Bury Council operates both passive diffusion tubes and automatic monitoring for NO₂, however there are no automatic monitors within 2km of Fairfield Hospital.

There are five NO₂ diffusion tube monitoring sites located within 2km of Fairfield Hospital. Details of these monitoring sites are shown in Table 2. Locations of these are shown in

Figure 2.

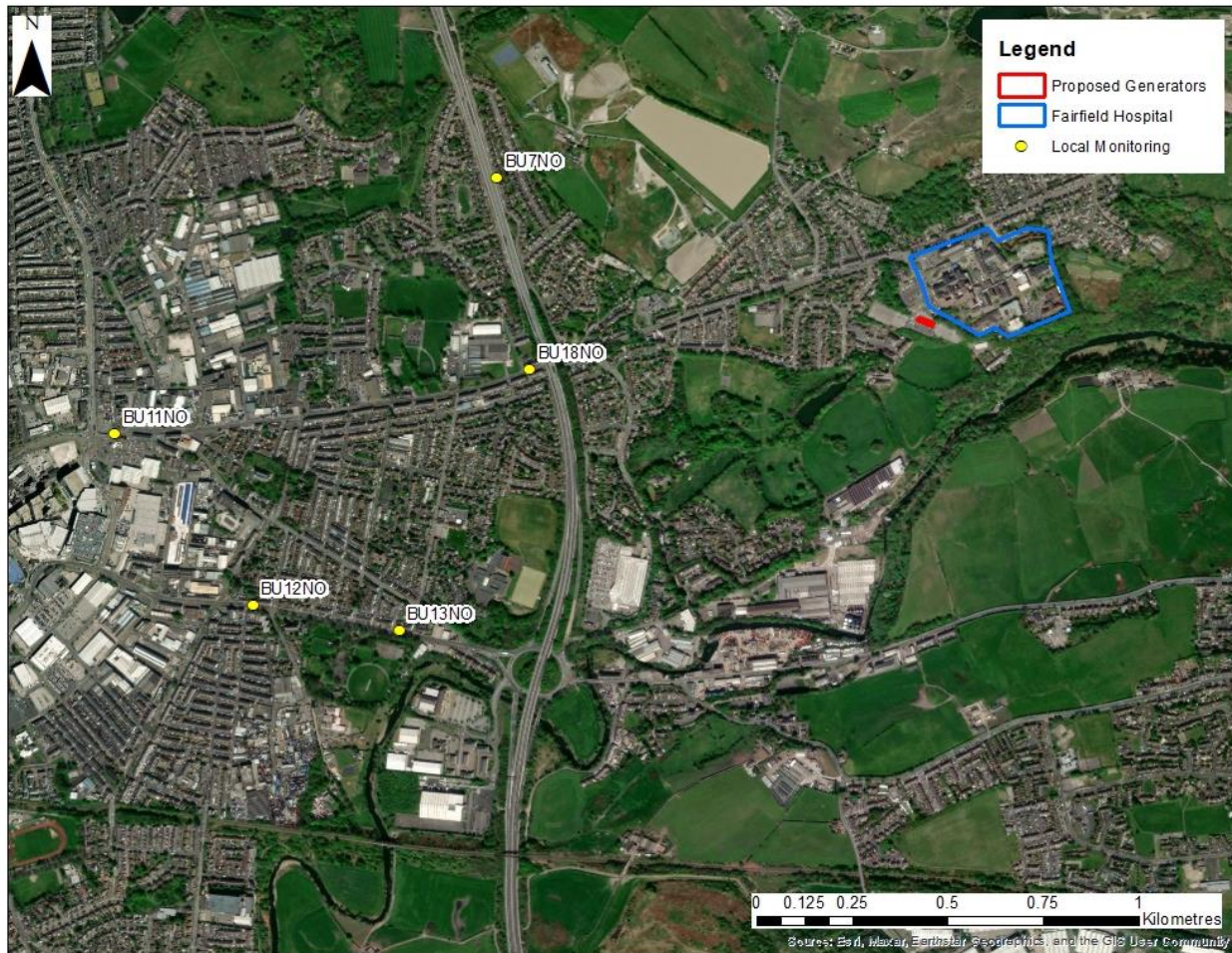
Table 2: Diffusion tube monitoring results for annual mean NO₂ from 2019 to 2022

Site ID	OS Grid Reference		Site Type	Height (m)	Annual Mean NO ₂ Concentration (µg/m ³)			
	X	Y			2019	2020	2021	2022
BU7	381984	411866	Roadside	2.7	30.6	23.4	24.8	25.9
BU11	380980	411193	Roadside	2.5	41.3	32.3	33.5	34.7
BU12	381344	410744	Kerbside	2.2	53.6	35.0	40.9	38.7
BU13	381728	410677	Kerbside	2.5	49.7	34.0	39.8	36.9
BU18	382071	411362	Roadside	2.3	38.2	27.9	30.3	30.3
Note: Exceedances of the annual air quality standard for NO ₂ (40µg/m ³) are highlighted in bold								

²⁶ Environment Act 2021. Available at: <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted> [Accessed April 2024].

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Figure 2: Local monitoring locations



Exceedances of the NO₂ annual mean standard were recorded at three monitoring sites in 2019. Due to the Covid-19 pandemic, 2020 and 2021 are not considered representative of baseline conditions in the local area. In 2022, which is the latest year of available representative data, there were no recorded exceedances of the annual mean NO₂ air quality objective at any of the monitoring sites within 2km of Fairfield Hospital.

The closest monitoring site to Fairfield Hospital is BU18, which is approximately 900m west of Fairfield Hospital. This is a roadside location and is therefore not considered representative of concentrations at Fairfield Hospital. However, it is useful to understand the pollutant concentrations in relation to the Air Quality Standards on the local road network (with background concentrations likely to be lower than those at roadside sites).

3.3 Background Concentrations

Background concentrations refer to the existing levels of pollution in the atmosphere, produced by a variety of stationary and non-stationary sources, such as roads and industrial processes. The Defra website²⁷ includes

²⁷ Defra, <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018> [Accessed April 2024]

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estimated background pollutant concentrations for NO_x, NO₂, PM₁₀ and PM_{2.5} for each 1km by 1km OS grid square in the UK.

The 2022 Defra background pollutant concentrations for the 1km grid squares that intersect Fairfield Hospital are shown in Table 3

Table 3: Defra background concentrations for 2022

OS Grid Reference		Annual Mean Background Concentration (µg/m ³)			
X	Y	NO _x	NO ₂	PM ₁₀	PM _{2.5}
383500	411500	17.1	12.7	10.7	7.2
382500	411500	19.9	14.6	12.3	8.1

Defra's predicted concentrations can be compared with the closest measured background concentrations. The closest background monitoring site is RO24A, which is located approximately 4.7km east of Fairfield Hospital and is operated by Rochdale Borough Council. The comparison between the Defra concentrations and monitoring site RO24A for the same year (2022) is presented in Table 4.

The measured NO₂ annual mean concentration at RO24A is higher than the estimated Defra concentration. Although monitoring site RO24A is a considerable distance from Fairfield Hospital, it can be considered representative of local background concentrations as it is in a similar setting and landscape, and is also a similar distance from main roads.

Table 4: Comparison between monitored and Defra background concentrations for 2022

OS Grid Reference		Defra NO ₂ background concentration (µg/m ³)	Measured NO ₂ background concentration (µg/m ³)	Difference (µg/m ³)	Difference (%)
X	Y				
383500	411500	12.7	24.0	11.3	47.0
382500	411500	14.6	24.0	9.4	39.0

No nearby background monitoring sites recorded PM₁₀ and PM_{2.5} concentrations, so these have been excluded from the comparison and Defra backgrounds have been used in the assessment.

3.4 Baseline Summary

In summary, the concentrations of annual mean NO₂ at Fairfield Hospital, away from the main roads are likely to be similar to the concentrations recorded in 2022 at RO24A (24.0µg/m³) which is the closest urban background monitoring site. Closer to the main roads there is a risk that the existing concentrations will be above the air quality standards. No local monitoring sites nearby to Fairfield Hospital recorded PM₁₀ and PM_{2.5} concentrations, however the highest Defra background concentrations for the grid squares that Fairfield Hospital intersects in 2022 were 12.3µg/m³ and 8.1µg/m³ for PM₁₀ and PM_{2.5}, respectively which are well below the relevant air quality standards.

4. Sensitive Receptors

Sensitive human receptors in relation to air quality assessments are defined as those properties, schools, hospitals (including care homes) that are likely to experience a change in pollutant concentrations and/or dust nuisance.

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A desk-top study was undertaken to identify existing sensitive receptors in the vicinity of Fairfield Hospital to consider the impact of the proposed generators. Representative sensitive human receptors have been identified at locations likely to experience the greatest change in pollutant concentrations due to the testing of the proposed standby generators.

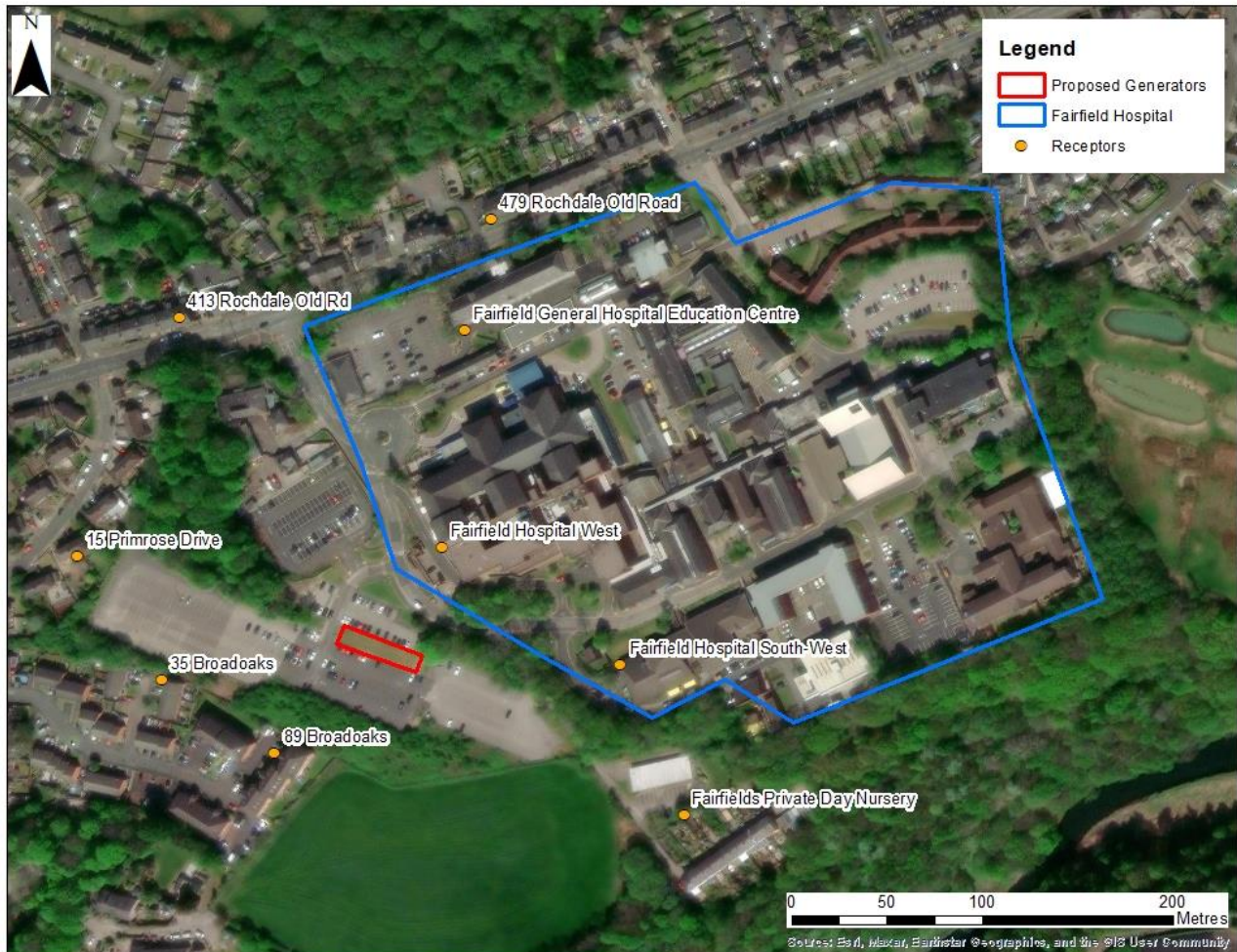
The closest sensitive receptors to the proposed standby generators will be those within the Fairfield Hospital site. Details of the receptors to be considered are presented in Table 5, with the receptor locations shown in Figure 3.

Table 5: Nearby sensitive receptors

Name	Type	OS Grid Reference	
		X	Y
Fairfield Hospital West	Hospital	383140	411542
Fairfields Private Day Nursery	Nursery	383267	411401
89 Broadoaks	Residential	383052	411434
15 Primrose Drive	Residential	382949	411537
413 Rochdale Old Rd	Residential	383002	411662
Fairfield Hospital South-West	Residential	383234	411480
Fairfield General Hospital Education Centre	School	383152	411655
479 Rochdale Old Road	Residential	383166	411713
35 Broadoaks	Residential	382993	411472

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Figure 3: Sensitive receptors within the vicinity of the proposed generators



5. Potential Impacts and Recommendations

The two diesel powered standby generators to be installed at Fairfield Hospital are only expected to be used as backup for emergency purposes and will be tested at 100% load once per year. Based on this minimal run time, which equates to a maximum of 24 hours per year, and the low background NO₂ concentrations, it is not anticipated that there will be any significant adverse effects on the nearby sensitive receptors, and the aim of delivering a carbon neutral Greater Manchester no later than 2038.

In order to further improve the likely impacts the following recommendations could be considered:

- According to the diesel generators' technical information, the generators will produce NO_x concentrations of approximately 2,500mg/Nm³, which exceeds the EA Best Available Technique (BAT) guidelines for standby generators (2,000mg/Nm³). It is therefore recommended that generators that are within the BAT guidelines are considered in order to limit NO_x emissions and potential impacts.
- Exhaust stacks could also be constructed above the generators to improve the dispersion of emissions and reduce the potential exposure of sensitive receptors during generator testing.

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- Testing should take place during the colder, winter months as nearby buildings are more likely to have windows closed, which will further limit the exposure of sensitive receptors to emissions.

It is also anticipated that a MCP permit for emissions to air will be required as the thermal input of the generators will exceed 1MWth but will not exceed 50MWth, however this is outside the scope of this review and will require further consultation with the EA.

6. Conclusions

This technical note has provided a qualitative review of local baseline air quality, the Greater Manchester carbon neutrality commitment, and the potential impacts that may arise from the installation of a generator compound containing two diesel standby generators and two fuel tanks at Fairfield General Hospital, Bury.

The proposed standby generators do not contradict any legislation or local policy, however a full assessment of emissions arising from the testing of the generators may be required to satisfy Policy JP-S5 in the Greater Manchester Combined Authority Places for Everyone Joint Development Plan (2024)¹⁹

The baseline conditions at Fairfield Hospital are likely to be similar to the background monitoring site RO24A which recorded a NO₂ concentration of 24.0µg/m³ in 2022, which is the latest year of available monitoring data. This is below the annual air quality standard of 40µg/m³. No local monitoring sites nearby to Fairfield Hospital recorded PM₁₀ and PM_{2.5} concentrations, however the highest Defra background concentrations in 2022 for the grid squares that Fairfield Hospital intersects were 12.3µg/m³ and 8.1µg/m³ for PM₁₀ and PM_{2.5}, respectively. These are both below the relevant annual air quality standards (40µg/m³ and 12µg/m³ for PM₁₀ and PM_{2.5}, respectively).

Based on this minimal run time and low background NO₂ concentrations, it is not anticipated that there will be any significant adverse effects on the nearby sensitive receptors. Recommendations have been outlined above that could be used to improve the dispersion of emissions and reduce overall impacts. It is recommended that BAT compliant generators are considered to reduce the overall emissions, and exhaust stacks could also be added to the generators to aid dispersion and reduce concentrations at receptor locations.

It is also anticipated that a MCP permit for emissions to air will be required as the thermal input of the generators will exceed 1MWth but will not exceed 50MWth.

Overall, it is not considered that the addition of two backup standby generators tested only once per year and used for emergency purposes only would cause adverse air quality impacts, and the aim of meeting of a carbon neutral Greater Manchester no later than 2038.

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DOCUMENT CHECKING