

Air Quality Assessment: Ty Mawr, Pontardawe

October 2021



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management & assessment



Document Control

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Executive Summary

The air quality impacts associated with the proposed residential development at Ty Mawr, Pontardawe, Neath have been assessed. The proposed development involves the conversion and extension of a former sheltered housing building to provide 12 residential flats.

The proposed development will not generate any significant additional traffic on the local road network and therefore there will be no significant effects at any existing, sensitive receptor.

The application site is on a quiet road, and the assessment has demonstrated that future residents of the proposed development will experience acceptable air quality in relation to nitrogen dioxide and particulate matter concentrations, which are expected to be well below the relevant air quality objectives. The assessment has, however, identified that the annual mean Target Value for nickel concentrations has been predicted to be exceeded across the application site in 2019 (based on dispersion modelling undertaken on behalf of the Welsh Government) and therefore there is the potential for future residents to be exposed to elevated nickel concentrations.

The main source of nickel emissions in the local area has been identified as the Wall Colmonoy site and it is understood that the operator (Wall Colmonoy), Neath Port Talbot County Borough Council (as the permitting authority) and Natural Resource Wales are working together with the aim to reduce nickel emissions from this site.

Given the potential for exposure of future residents to nickel concentrations exceeding the Target Value, it is recommended that a mechanical heating, ventilation and air conditioning (HVAC) system with high-efficiency particulate air (HEPA) filters is installed at the proposed development to provide appropriately filtered and conditioned air to all habitable rooms, without recourse to opening the windows. Provided an adequately designed HVAC system is installed and appropriately maintained, the exposure of future residents to nickel concentrations will be reduced, such that residual effects are judged to be 'not significant'.

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1 Introduction

1.1 This report describes the potential air quality impacts associated with the proposed residential development at Ty Mawr, Pontardawe, Neath. The proposed development will provide 12 dwellings and 12 car parking spaces.

1.2 The application site is located in the jurisdiction of Neath Port Talbot County Borough Council (NPTCBC). The application site is not located within an Air Quality Management Area (AQMA), however, monitoring undertaken by NPTCBC and dispersion modelling on behalf of the Welsh Government has identified a risk of elevated concentrations of nickel in Pontardawe. Pre-application advice received from NPTCBC states:

“The Authority’s Environmental Health Officer has advised that if an application were to be submitted he would raise an objection on the grounds that the application site is located in the nickel exceedance area...”

The data available suggests that the site is at high risk, making unsuitable for residential purposes. This will put any potential residents at higher risk of nickel exposure and subsequent negative health effects. Therefore, he recommends that any planning application submitted should be accompanied by an Air Quality Assessment.”

1.3 It is acknowledged that the proposed development will introduce residential exposure into this area of potentially poor air quality for nickel, thus an assessment is required to determine the air quality conditions that future residents will experience and consideration of potential mitigation measures. It is noted that the extant permission/existing use on the site is for residential use (sheltered housing) with 4 car parking spaces. The proposed development includes 12 parking spaces (an increase of 8 spaces compared to existing use), therefore traffic generation will be minimal and the potential impact of the proposed development on local air quality will be considered qualitatively within this report.

1.4 The residential units within the proposed development will be provided with heat and hot water by individual domestic boilers within each unit; there will be no centralised energy plant or back-up generators and thus no significant point sources of emissions within the proposed development.

1.5 The location and setting of the proposed development are shown in Figure 1, along with the relevant nearby monitoring sites and industrial sources.

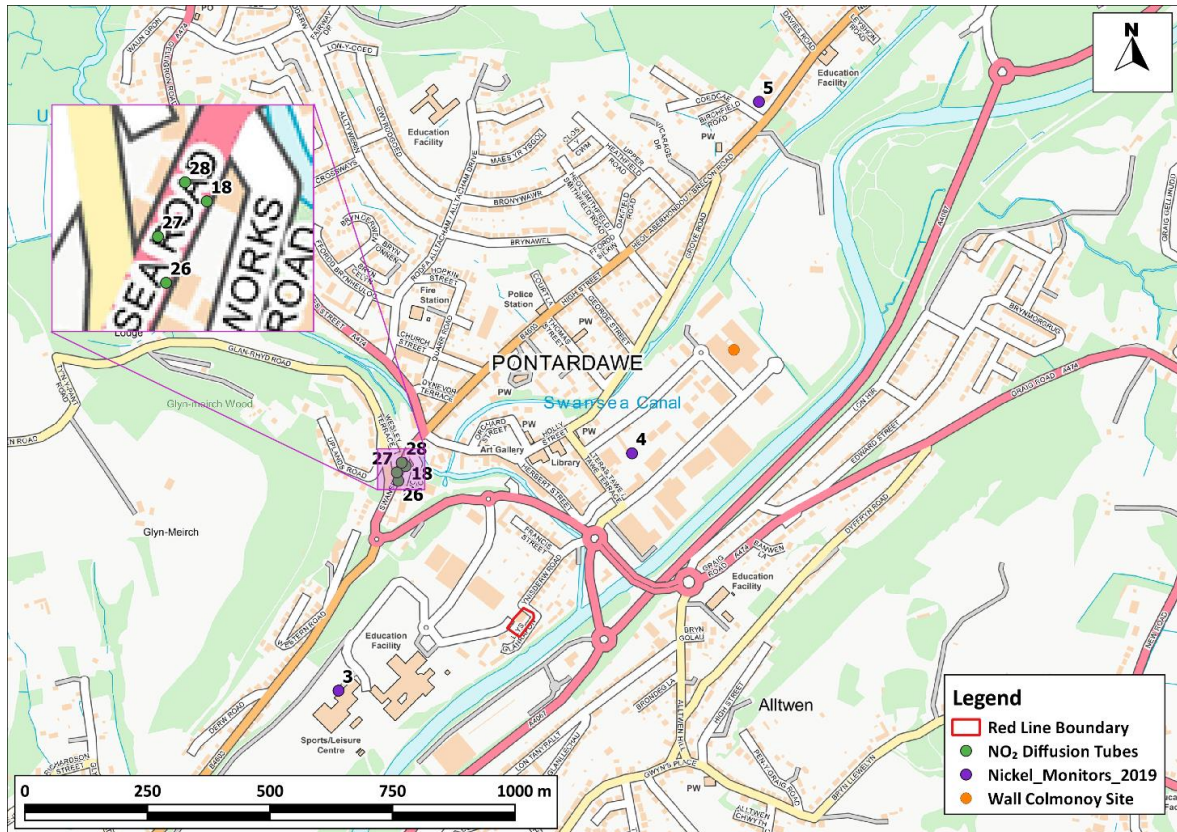


Figure 1: Proposed Development Setting in the Context of Air Quality

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- 1.6 This report describes existing local air quality conditions and assesses the potential impacts of the proposed development in the anticipated first year of occupation of the new homes (2023). This report has been prepared taking into account all relevant local and national guidance and regulations.

2 Policy Context

- 2.1 All European legislation referred to in this report is written into UK law and remains in place, although there is uncertainty at this point in time as to who will enforce the requirements of some of this legislation.

Air Quality Strategy

- 2.2 The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. Local authorities are seen to play a particularly important role. The strategy describes the Local Air Quality Management (LAQM) regime that has been established, whereby every authority has to carry out regular reviews and assessments of air quality in its area to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an Air Quality Management Area (AQMA), and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

Clean Air Strategy 2019

- 2.3 The Clean Air Strategy (Defra, 2019) sets out a wide range of actions by which the UK Government, in partnership with the Governments of Scotland, Wales and Northern Ireland, will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. At this stage, there is no straightforward way to take account of the expected future benefits to air quality within this assessment.

The Clean Air Plan for Wales

- 2.4 In August 2020, the Welsh Government published the Clean Air Plan for Wales (Welsh Government, 2020), which aims to *“improve air quality and reduce the impacts of air pollution on human health, biodiversity, the natural environment and our economy”*. The Plan sets out the following four themes, around which the plan is structured, with actions in order to enable collaborative approaches to reducing air pollution;

- People: Protecting the health and well-being of current and future generations;
- Environment: Taking action to support our natural environment, ecosystems and biodiversity;
- Prosperity: Working with industry to reduce emissions, supporting a cleaner and more prosperous Wales; and

- Place: Creating sustainable places through better planning, infrastructure and transport.
- 2.5 The Plan details intentions to publish a Clean Air Zone Framework in Spring 2021, stating an expectation *“to see Clean Air Zones established in towns and cities throughout Wales to reduce the impact of transport emissions on health. Some of these may be supported by a charging element. Clean Air Zones, where appropriate, would enable a range of co-ordinated actions to deliver significant reductions in public and environmental exposure to harmful airborne pollutants from all sources”*.
- 2.6 The Plan also includes plans to *“introduce LAQM policy changes by 2023 to ensure the regime is public health focused and proactively finding and tackling areas of pollution”*. These changes include a focus on the human health impacts of PM_{2.5}, stating *“In the current regime, monitoring of PM_{2.5} is encouraged but not mandatory. In the context of the known health impacts associated with PM_{2.5}, we propose to investigate the extent to which Local Authorities can support monitoring, reporting and action on PM_{2.5} as part of their existing LAQM functions”*.
- 2.7 The Plan states that the Welsh Government will *“publish and consult on a White Paper on a Clean Air Act for Wales before the end of this Senedd Term”*, which will include:
- *“New powers for smoke control linked to tackling air pollution from domestic burning (PM_{2.5})”*
 - *A requirement for a Clean Air Plan / Strategy to be published / reviewed every 5 years*
 - *Potential new air quality targets (for example, taking account of WHO guidelines for air quality)*
 - *Clarified and strengthened local air quality management legislation*
 - *Strengthened powers to address road vehicle idling*
 - *Consolidated powers to implement Clean Air Zones / Low Emission Zones*
 - *Focused powers to protect vulnerable groups from the effects of air pollution*
 - *Enhanced air quality monitoring and modelling*
 - *A potential new duty on public bodies to adhere to guidance encouraging different ways of working and actions to reduce air pollution and support decarbonisation.”*

Planning Policy

National Policies

- 2.8 Land-use planning policy in Wales is established within the policy document Planning Policy Wales (PPW) (Welsh Government, 2021), which provides the strategic policy framework for the effective preparation of local planning authority development plans. With regard to pollution and health effects, it states:

“Planning authorities have a role to play in the prevention of physical and mental illnesses caused, or exacerbated, by pollution, disconnection of people from social activities (which contributes to loneliness) as well as the promotion of travel patterns which facilitate active lifestyles. The planning system must consider the impacts of new development on existing communities and maximise health protection and well-being and safeguard amenity. This will include considering the provision of, and access to, community and health assets, such as community halls, libraries, doctor’s surgeries and hospitals. Health impacts should be minimised in all instances, and particularly where new development could have an adverse impact on health, amenity and well-being. In such circumstances, where health or amenity impacts cannot be overcome satisfactorily, development should be refused”.

“Planning authorities should develop and maintain places that support healthy, active lifestyles across all age and socio-economic groups, recognising that investment in walking and cycling infrastructure can be an effective preventative measure which reduces financial pressures on public services in the longer term. The way a development is laid out and arranged can influence people’s behaviours and decisions and can provide effective mitigation against air and noise pollution. Effective planning can provide calming, tranquil surroundings as well as stimulating and sensory environments, both of these make an important contribution to successful places”

“Green infrastructure can be an effective means of enhancing health and well-being, through linking dwellings, workplaces and community facilities and providing high quality, accessible green spaces. In all development and in public spaces especially, there should be sensitive management of light, and exposure to airborne pollution should be kept as low as reasonably practicable. The compatibility of land uses will be a key factor in addressing air quality and creating appropriate soundscapes which are conducive to, and reflective of, particular social and cultural activities and experiences, particularly in busy central areas of towns and cities. Equally, the provision of quiet, tranquil areas which provide peaceful sanctuaries in otherwise noisy environments can help to reduce general levels of pollution and promote both mental and physical well-being”.

- 2.9 PPW places a general presumption in favour of sustainable development, stressing the importance of local development plans, and states that the planning system should perform an environmental role to minimise pollution. Local development plans should enable consideration of the effects that the proposed development may have on air quality, as well as the effect that air quality may have on the proposed development. To prevent unacceptable risks from air pollution, planning decisions should ensure that new development is appropriate for its location.
- 2.10 PPW also places considerable emphasis on the Well-being of Future Generations Act (Welsh Government, 2015) with the intention to improve the social, economic, environmental and cultural well-being of Wales, and outlines how this can be achieved through the concept of ‘Placemaking’.

- 2.11 PPW is supported by a series of Technical Advice Notes (TANs) and National Assembly for Wales Circulars. Local planning authorities have to take PPW, TANs and Circulars into account when preparing Development Plans.
- 2.12 With respect to planning policy guidance, TAN 18 on transport (Welsh Government, 2007) makes reference to local air quality and the need for Air Quality Action Plans to be prepared for any Air Quality Management Areas declared.
- 2.13 The need for compliance with any statutory air quality limit values and objectives is stressed, and the presence of AQMAs must be accounted for in terms of the cumulative impacts on air quality from individual sites in local areas. New developments in AQMAs should be consistent with local air quality action plans.

Local Transport Plan

- 2.14 The Joint Transport Plan for South West Wales, 2015-2020 (Carmarthenshire, Neath Port Talbot, Pembrokeshire and Swansea Councils, 2015) replaces the individual local transport plans previously adopted by the four councils. The plan includes Policy E2 which states that the Councils will:

“facilitate and promote improved rail and bus services, walking, cycling and car sharing to encourage modal shift and improve air quality.”

Local Policies

- 2.15 The NPTCBC Local Development Plan (Neath Port Talbot County Borough Council, 2016a) was adopted in January 2016, and within this document there are three policies which refer to air quality.

- 2.16 Policy SP16 of the Local Plan refers specifically to air quality and states that:

“Air, water and ground quality and the environment generally will be protected and where feasible improved through the following measures:

1. *Ensuring that proposals have no significant adverse effects on water, ground or air quality and do not significantly increase pollution level...*
3. *Ensuring that developments do not increase the number of people exposed to significant levels of pollution.”*

- 2.17 Policy EN 8 Pollution and Land Stability states that:

“Proposals which would be likely to have an unacceptable adverse effect on health, biodiversity and/or local amenity or would expose people to unacceptable risk due to the following will not be permitted:

- *Air pollution...*

... Proposals which would create new problems or exacerbate existing problems detailed above will not be acceptable unless mitigation measures are included to reduce the risk of harm to public health, biodiversity and/or local amenity to an acceptable level."

- 2.18 Policy EN 9 also relates to air quality, however it relates to development in the central Port Talbot area and is therefore not of relevance to this report.
- 2.19 In addition, as part of the Local Development Plan, the Council has produced Pollution Supplementary Planning Guidance (SPG) (Neath Port Talbot County Borough Council, 2016b). Section 3 of this SPG covers air pollution and includes an overview of the main pollutants of local concern in the Neath Port Talbot area. Nickel is included as a pollutant of concern for the local area in relation to the Wall Colmonoy plant at Pontardawe due to the significant quantities of nickel used during manufacturing processes at this facility. The SPG notes the requirement to comply with Policy EN8 of the Local Plan

Air Quality Action Plans

National Air Quality Plan

- 2.20 Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide (NO₂) concentrations in the UK (Defra, 2017). Alongside a package of national measures, the Plan requires Local Authorities that are predicted to have exceedances of the limit values beyond 2020 to have produced local action plans by December 2018. These plans must have regard to measures to achieve the statutory limit values within the shortest possible time, which may include the implementation of a Clean Air Zone (CAZ). There is currently no practical way to take account of the effects of the national plan in this assessment; however, consideration has been given to whether there is currently, or is likely to be in the future, a limit value exceedance in the vicinity of the proposed development. This assessment has principally been carried out in relation to the air quality objectives, rather than the limit values that are the focus of the Air Quality Plan.

Welsh Government Supplemental Air Quality Plan

- 2.21 The Welsh Government has produced a supplemental plan to the 2017 UK plan for tackling roadside nitrogen dioxide concentrations (Welsh Government, 2018). The document sets out the work done to date to identify how the Welsh Government will reduce concentrations of nitrogen dioxide around roads where levels are above legal limits. The plan expands on Section 7.6 (Additional Actions in Wales) of the 2017 UK plan for tackling roadside nitrogen dioxide concentrations, and sets out how the Welsh Government will comply within the shortest possible time with the limit values for nitrogen dioxide.

Local Air Quality Action Plan

- 2.22 The NPTCBC Air Quality Action Plan (Neath Port Talbot County Borough Council, 2012) sets out a series of measures by which the Council will seek to achieve the air quality objectives in their AQMA. The application site is not located in or near to the AQMA and therefore the policies are not considered relevant to this assessment.

3 Assessment Criteria

Health Criteria

- 3.1 The UK Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the UK Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (Wales) Regulations (2000) and the Air Quality (Amendment) (Wales) Regulations (2002).
- 3.2 The UK-wide objectives for nitrogen dioxide and PM₁₀ were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter. The PM_{2.5} objective was to be achieved by 2020. Measurements across the UK have shown that the 1-hour nitrogen dioxide objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m³ (Defra, 2021a). Therefore, 1-hour nitrogen dioxide concentrations will only be considered if the annual mean concentration is expected to be above this level. Measurements have also shown that the 24-hour mean PM₁₀ objective could be exceeded at roadside locations where the annual mean concentration is above 32 µg/m³ (Defra, 2021a).
- 3.3 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Defra explains where these objectives will apply in its Local Air Quality Management Technical Guidance (Defra, 2021a). The annual mean objectives for nitrogen dioxide and PM₁₀ are considered to apply at the façades of residential properties, schools, hospitals etc.; they do not apply at hotels. The 24-hour mean objective for PM₁₀ is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels. The 1-hour mean objective for nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.
- 3.4 EU Directive 2008/50/EC (The European Parliament and the Council of the European Union, 2008) sets limit values for nitrogen dioxide, PM₁₀ and PM_{2.5}, and is implemented in law through the Air Quality Standards (Wales) Regulations (2010). The limit values for nitrogen dioxide are the same numerical concentrations as the UK objectives, but achievement of these values is a national obligation rather than a local one. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values. Central Government does not normally recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded, unless such studies have been audited and approved by Defra and DfT's Joint Air Quality Unit (JAQU).

- 3.5 The EU Directive 2004/107/EC (The European Parliament and the Council of the European Union, 2004) sets out Target Values for the concentration in ambient air of several metals including nickel, as an annual mean. The Target Values are implemented in law through the Air Quality Standards (Wales) Regulations (2010) and the Target Values were to be met by 31st December 2012.
- 3.6 The relevant air quality criteria for this assessment are provided in Table 1.

Table 1: Air Quality Criteria for Nitrogen Dioxide, PM₁₀, PM_{2.5} and Nickel

Pollutant	Time Period	Objective
Nitrogen Dioxide	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
PM ₁₀	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³
PM _{2.5} ^a	Annual Mean	25 µg/m ³
Nickel	Annual Mean	20 ng/m ³

^a The PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

Road Traffic Screening Criteria

- 3.7 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM)¹ recommend a two-stage screening approach (Moorcroft and Barrowcliffe et al, 2017) to determine whether emissions from road traffic generated by a development have the potential for significant air quality impacts. The approach, as described in Appendix A1, first considers the size and parking provision of a development. If the development is residential and is for fewer than ten homes or covers less than 0.5 ha, or is non-residential and will provide less than 1,000 m² of floor space or cover a site area of less than 1 ha, and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment.
- 3.8 The second stage then compares the changes in vehicle flows on local roads that a development will lead to against specified screening criteria. The screening thresholds (described in full in Appendix A1) inside an AQMA are a change in flows of more than 25 heavy duty vehicles or 100 light duty vehicles per day; outside of an AQMA the thresholds are 100 heavy duty vehicles or 500 light duty vehicles. Where these criteria are exceeded, a detailed assessment is likely to be required, although the guidance advises that *“the criteria provided are precautionary and should be treated as indicative”*, and *“it may be appropriate to amend them on the basis of professional judgement”*.

¹ The IAQM is the professional body for air quality practitioners in the UK.

4 Assessment Approach

Pre-application Consultation

- 4.1 Pre-application advice was provided by NPTCBC (Pre-App. Ref.: Q2021/0074), in which the Council's Environmental Health Officer (EHO) highlighted concerns about existing nickel concentrations within Pontardawe. The EHO noted any future residents would be at risk of exposure to high levels of nickel and the potential related health impacts. Therefore, the EHO requested that an Air Quality Assessment should accompany the planning application for the proposed development.
- 4.2 A telephone conversation between Adam Clegg (Associate Director, Air Quality Consultants Limited) and Calum Lewis (EHO at NPTCBC) was undertaken on 9th June 2021 to better understand the historic issues associated with nickel concentrations in Pontardawe. The EHO advised that there is an on-going project between the Council (as the Permitting authority), Natural Resources Wales (NRW) and the Wall Colmonoy facility (the main source of nickel associated with the exceedance) to investigate whether the facility can be operated at emission levels recorded in 2017 when the ambient concentrations of nickel met the Target Value. This project is likely to last at least the next 12 months and, until any improvements have been implemented, and a demonstrable improvement in ambient nickel concentrations observed, the EHO will maintain a standing objection against all residential development in Pontardawe.

Existing Conditions

- 4.3 Existing sources of emissions and baseline air quality conditions within the study area have been defined using a number of approaches:
- industrial and waste management sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register (Defra, 2021c);
 - local sources have been identified through examination of the Council's Air Quality Progress Report (Neath Port Talbot County Borough Council, 2020) and further details taken from Defra's "*Report on measures for 2018 exceedance of the Target Value for Nickel in the Swansea Urban Area agglomeration zone (UK0027)*" (Defra, 2020) (hereafter referred to as the '*2018 Nickel Exceedance Report*') and "*Technical report on UK supplementary assessment under The Air Quality Directive (2008/50/EC), The Air Quality Framework Directive (96/62/EC) and Fourth Daughter Directive (2004/107/EC) for 2019*" (Ricardo Energy and Environment, 2021) (hereafter referred to as the '*2019 UK Supplementary Assessment under Air Quality Directives Report*');
 - information on existing air quality has been obtained by collating the results of monitoring carried out by the local authority; and

- background concentrations have been defined using Defra's 2018-based background maps (Defra, 2021b). These cover the whole of the UK on a 1x1 km grid. The background annual mean nitrogen dioxide maps for 2019 have been calibrated against concurrent measurements from national monitoring sites (AQC, 2020). The calibration factor calculated has also been applied to future year backgrounds. Mapped background concentrations of PM₁₀ and PM_{2.5} have not been adjusted.

Road Traffic Impacts

- 4.4 The first step in considering the road traffic impacts of the proposed development has been to screen the development and its traffic generation against the criteria set out in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017), as described in Paragraph 3.7 and detailed further in Appendix A1. Where impacts can be screened out there is no need to progress to a more detailed assessment.

Impact of Existing Sources on Future Users of the Development

- 4.5 The impacts of concentrations of nitrogen dioxide, PM₁₀, PM_{2.5} and nickel on future residents of the proposed development have been assessed qualitatively. The assessment considers air quality conditions within the application site taking account of local air quality monitoring data and proximity to local road traffic and industrial sources.
- 4.6 The assessment examines air quality conditions in 2019², and assumes these are representative of air quality conditions at the time the proposed development is occupied; this assumption is considered to be worst-case as it is generally expected that nitrogen dioxide, PM₁₀ and PM_{2.5} concentrations will decline in future years.

² In early 2020, activity in the UK was disrupted by the Covid-19 pandemic. As a result, concentrations of traffic related air pollutants fell appreciably (Defra Air Quality Expert Group, 2020). While the pandemic may cause long lasting changes to travel activity patterns, it is reasonable to expect a return to more typical activity levels in the future. 2019 monitoring data were collected prior to the effects of the pandemic, and it is therefore judged appropriate to use these data to provide a worst-case assessment.

5 Baseline Conditions

Relevant Features

- 5.1 The proposed development is located in the town of Pontardawe, in the Swansea Valley, south Wales. The application site is bounded by Ynisderw Road (there is a barrier across this road adjacent to the site which means it cannot be used as a through road) and Llys Glanrafon, which are minor roads in a residential area. There is an existing building on the application site which was formally used as sheltered housing, i.e. for residential purposes. There are existing residential properties to the north, east and south of the application site.
- 5.2 A petrol station is located approximately 100 m south-east from the application site, however as noted in LAQM Technical Guidance (hereafter referred to as LAQM.TG16) (Defra, 2021a), petrol stations can be screened out of assessments when exposure is greater than 10 m from the pumps.
- 5.3 The proposed development is not located near to an AQMA, however, monitoring by NPTCBC and modelling undertaken on behalf of Defra and the Devolved Administrations (i.e. the Welsh Government) has identified elevated concentrations of nickel in Pontardawe. Further details on the main source of nickel emissions in the area are provided in the following sections.

Industrial sources

- 5.4 There are no Part A activities, i.e. industrial installations requiring a permit from Natural Resources Wales, in the vicinity of the site (the nearest being over 4 km from the application site).
- 5.5 There are three Part B permitted installations in Pontardawe, regulated by NPTCBC. Two are petrol stations and not within 10 m of the application site, and therefore as detailed above are not considered further within this assessment. The third permitted site, is operated by Wall Colmonoy Limited (permit ref:E3/1/56) with processes covered under Process Guidance 6/35(13) “*Statutory guidance for metal powder and other thermal spraying processes*” (Defra, 2013).
- 5.6 As noted in Section 2, nickel is a pollutant of concern in Pontardawe with the principal source noted to be the Wall Colmonoy installation which uses significant quantities of nickel during manufacturing processes. Both measured and modelled data are available for nickel concentrations in Pontardawe and are discussed further in the next sections of this report.

Local Air Quality Monitoring

Nitrogen Dioxide and Particulate Matter

- 5.7 NPTCBC operates six automatic monitoring stations within its area for nitrogen dioxide and/or PM₁₀ and PM_{2.5}, however, none of these are within the study area. The Council also operates a number of nitrogen dioxide monitoring sites using diffusion tubes prepared and analysed by Environmental Scientifics Group Socotec (using the 50% TEA in acetone method). These include four tubes

deployed in Pontardawe, on building facades adjacent to the A474 (Swansea Road) near the town centre. Annual mean results for the years 2015 to 2019 are summarised in Table 2 and the monitoring locations are shown in Figure 1. The monitoring data has been taken from NPTCBC's 2020 Annual Status Report (Neath Port Talbot County Borough Council, 2020).

Table 2: Summary of Annual Mean NO₂ Monitoring (2015 - 2019) (µg/m³)

Site No.	Site Type	Location	2015	2016	2017	2018	2019
18 ^a	Roadside	Pontardawe Post Office	36.8	33.9	37.1	32.6	36.8
26	Roadside	10 Swansea Road, Pontardawe	32.7	30.9	34.7	29.9	33.0
27	Roadside	11a Swansea Road, Pontardawe	39.1	36.6	38.3	34.4	37.0
28	Roadside	8 Swansea Road, Pontardawe	27.6	26.1	27.5	24.2	24.4
Objective			40				

^a Average of triplicate diffusion tubes.

- 5.8 Between 2015 to 2019, there were no measured exceedances of the annual mean nitrogen dioxide objective at any of the diffusion tube sites in Pontardawe. There is no clear trend in measured concentrations at these sites. The diffusion tube locations are not considered to be representative of the conditions at the application site, due to their proximity to a main road (the A474), whereas the application site is adjacent to residential streets which would have significantly lower traffic flows. It is, therefore, anticipated that annual mean NO₂ at the application site would likely be lower than the concentrations reported in Table 2.
- 5.9 No monitoring of PM₁₀ or PM_{2.5} concentrations is undertaken within the study area.

Nickel

- 5.10 NPTCBC operates a ThermoFisher Partisol™ 2025 gravimetric sampling system at Pontardawe Leisure Centre, which monitors particulate matter with subsequent laboratory analysis for 13 heavy metals including nickel³. There are two additional locations monitoring nickel concentrations in Pontardawe as part of the Heavy Metals Network (operated for the Environment Agency, on behalf of Defra and the Devolved Administrations by the National Physical Laboratory). These two locations are also gravimetric sampling systems (ThermoFisher Partisol™ 2000) at Tawe Terrace and Brecon Road and represent locations upwind and downwind, respectively, of the Wall Colmonoy site. Annual mean results for nickel for the years 2014 to 2019 are summarised in Table 3 and the

³ Whilst the filters are also analysed for other heavy metals, none of the Air Quality Directive Objectives or Target Values (where available) have been exceeded in recent years and therefore this data has not been presented within this report.

monitoring locations are shown in Figure 1. The monitoring data has been taken from the 2018 Nickel Exceedance Report (Defra, 2020).

Table 3: Summary of Annual Mean Nickel Monitoring (2014-2019) (ng/m³)^a

Site No.	Location	Location in relation to Wall Colmonoy Site	Distance to application site	2014	2015	2016	2017	2018	2019
3	Pontardawe Leisure Centre	1 km upwind	0.4 km	22	15	22	10	20.2	15.7
4	Pontardawe Tawe Terrace	0.27 km upwind	0.4 km	43	28	47	19	57	35
5	Pontardawe Brecon Road	0.5 km downwind	1.2 km	8.1	9.2	4.8	4.5	6.2	5.6
Target Value				20					

^a values presented to the same level of accuracy as reported; exceedances of the Target Value highlighted in **bold**.

- 5.11 Between 2014 to 2019, the annual mean nickel Target Value of 20 ng/m³ was exceeded at both monitors located upwind of the Wall Colmonoy site on a number of occasions. At the Pontardawe Leisure Centre, the Target Value was exceeded in 2014, 2016 and 2018. The Target Value was exceeded at the Tawe Terrace monitor in all years presented, except 2017, and in most years the measured concentration was more than double the Target Value. It is noted that the application site is also located predominantly upwind of the Wall Colmonoy site (approximately 0.64 km).
- 5.12 The annual mean nickel concentrations measured at the Brecon Road monitor, which is approximately 0.5 km downwind of the Wall Colmonoy site, were well below the Target Value and no exceedances were recorded between 2014 and 2019.

Exceedances of Nickel Target Value

- 5.13 As detailed in paragraph 3.5, the Target Value for annual mean nickel concentrations in ambient air is 20 ng/m³. The EU Directive 2004/107/EC (The European Parliament and the Council of the European Union, 2008) requires that all Member States⁴ report on measures in place to address the exceedance of the Target Value and detail all reasonable measures to ensure the Target Value is not exceeded. Measured nickel concentrations recorded upwind of the Wall Colmonoy site (Table 3) have exceeded the Target Value on a number of occasions. The 2018 Nickel Exceedance Report (Defra, 2020) includes details of source apportionment studies, measures set out to try to achieve compliance and a detailed dispersion modelling study (for 2018); these studies are summarised

⁴ The UK exited the European Union on 31st January 2020 with a transition period ending on the 31st December 2020. It is understood that although the transition period has now ended, the UK will continue to meet the reporting requirements of the EU Directive 2004/107/EC.

below. A more recent dispersion modelling study, for 2019, is also summarised with details taken from the 2019 UK Supplementary Assessment under Air Quality Directives Report (Ricardo Energy and Environment, 2021).

Source Apportionment

- 5.14 The source apportionment work reported by the Welsh Government (Defra, 2020), confirms that the largest sector associated with the measured exceedances are industrial sources, with Wall Colmonoy stack emissions being the main source. The report notes that *“In previous years, the Welsh Government have commissioned supplementary monitoring studies to improve the confidence in the source apportionment and identification of the predominant Ni sources”*. An additional study was also undertaken by King’s College London to measure hourly concentrations. These studies considered the relationships between local meteorological conditions, the nickel concentrations compared to other heavy metals and industrial activities. The studies both concluded that Wall Colmonoy appeared to be a significant source of nickel at the Tawe Terrace monitoring station, but did acknowledge the presence of other sources.

Measures to Improve Nickel Concentrations

- 5.15 The Clean Air Plan for Wales (Welsh Government, 2020) details the aim to achieve compliance with the Target Value for nickel, as soon as practicable. The 2018 Nickel Exceedance Report (Defra, 2020) presents a range of measures that have been taken and are to be taken at the Wall Colmonoy site.
- 5.16 NPTCBC, the regulator for the Wall Colmonoy site, has deemed the measures taken at the site to constitute Best Available Technology (BAT). Recent actions taken include:
- a review of the cleaning frequency of the wet arrester to avoid build-up of metal powder;
 - installation of a continuous particulate monitor in 2019,
 - frequency of the bag filter change in the central vacuum system increased to annual;
 - maintenance carried out on wet extractor for foundry (aqualine);
 - pollution monitoring inside the building in order to better understand fugitive emissions;
 - lip extraction installed on induction furnaces;
 - vibratory feeders were enclosed;
 - improvements were made to waste handling arrangements;
 - additional stack tests were carried out to gauge improvements to specific abatement plant e.g. fettling, cut-off saw;
 - tower 4 emissions were connected to different abatement plant for enhanced performance;

- replaced HEPA filters on abatement plant that emits to inside of building; and
- the permit was reviewed and varied.

Welsh Government Dispersion Modelling

- 5.17 A number of dispersion modelling studies have been undertaken in relation to the nickel exceedance, with the most recent publicly available study considering 2019 emissions (2019 UK Supplementary Assessment under Air Quality Directives Report) (Ricardo Energy and Environment, 2021). This dispersion modelling study was undertaken on behalf of the Welsh Government and Defra using ADMS 5.2, and predicted annual mean nickel concentrations for 2019 in the area of South Wales where exceedances of the Target Value were measured in 2019.
- 5.18 The report notes the dispersion of nickel emissions is strongly influenced by the terrain of the local area, stating:
- “The Swansea Valley runs south-west to north-east through the village of Pontardawe, where the point source is located. The distribution of the Ni concentrations in the vicinity of Pontardawe shows the channelling of the local wind flow by the Swansea Valley.”*
- 5.19 Figure 2 has been taken from the report and presents the annual mean nickel concentrations (ng/m³) in the modelled area for 2019. A purple star has been added to Figure 2 to indicate the approximate location of the application site; the application site lies within the area where the Target Value for nickel was predicted to be exceeded in 2019.

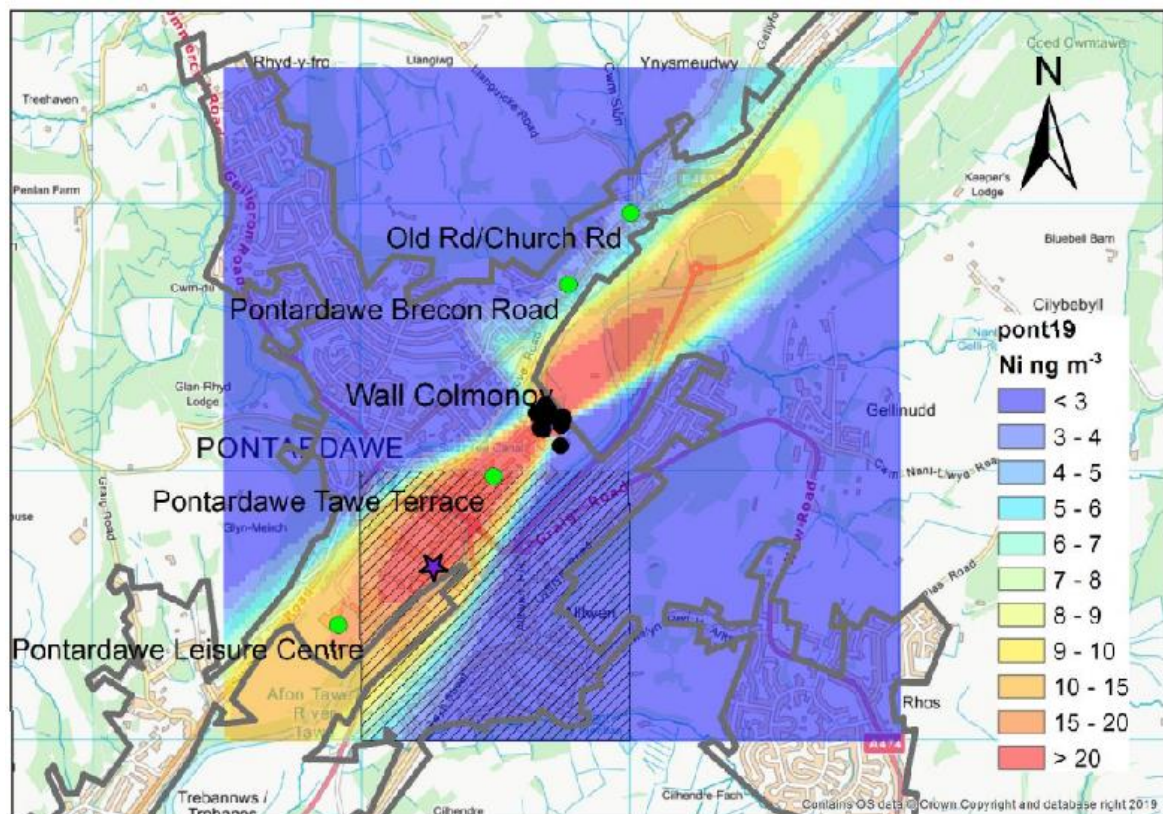


Figure 2: 2019 Modelled Annual Mean Nickel Concentration (ng/m³)

Figure taken from the 2019 UK Supplementary Assessment under Air Quality Directives Report (Ricardo Energy and Environment, 2021); purple star added to denote application site. Contains Ordnance Survey data © Crown copyright and database right 2019.

- 5.20 A review of the dispersion modelling study undertaken for 2018 (Defra, 2020) confirms that the application site was within the predicted area of Target Value exceedance.

Background Concentrations

- 5.21 Estimated background concentrations at the proposed development are set out in Table 4 and are all well below the objectives. 2019 has been used as a baseline year for consistency with the most recent available monitoring data presented in Table 2. 2023 represents the year in which the proposed development is expected to become occupied.

Table 4: Estimated Annual Mean Background Pollutant Concentrations in 2019 and 2023 (µg/m³)

Year	NO ₂	PM ₁₀	PM _{2.5}
2019	9.1	12.2	7.6
2023	7.7	11.6	7.2
Objective	40	40	25 ^a

- ^a The 25 µg/m³ PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

6 Impact Assessment

Impacts at Existing Receptors

Assessment of Development-Generated Road Traffic Emissions

- 6.1 The proposed development will provide 12 residential flats and 12 car parking spaces. Given the scale of the proposed development, the traffic generation associated within the operational phase is not expected to be significant. Whilst daily trips rates for the proposed development are not available, they will be well below the screening threshold of 500 Light Duty Vehicles (LDVs) recommended for use outside of an AQMA in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017) (see Paragraph 3.8). The proposed development will generate very few, if any, operational heavy vehicle trips. As such, it is judged that the relevant screening threshold, of 100 Heavy Duty Vehicles (HDVs) outside of an AQMA, will not be exceeded. There is therefore no requirement for a detailed assessment of road traffic impacts at existing receptors and it can be concluded that the proposed development will not have a significant impact on local roadside air quality.

Impacts of Existing Sources on Future Residents of the Development

Road Traffic Emissions

- 6.2 The proposed development is located well away from any busy roads, in an area where nitrogen dioxide and particulate matter concentrations would be expected to be close to background levels. Background concentrations of these pollutants at the site are well below the objectives (see Table 4), thus it can be concluded that future residents will experience acceptable air quality with regard to road traffic sources, and there is no need for more detailed assessment.

Nickel Concentrations

- 6.3 Modelling undertaken on behalf of Defra and the Devolved Administrations (Ricardo Energy and Environment, 2021) predicted that the Target Value for annual mean nickel concentrations of 20 ng/m³ was exceeded at the application site in 2019; this modelling was validated against measurements made in Pontardawe in 2019.
- 6.4 A number of measures are understood to have been implemented at the Wall Colomonoy site, which has been identified as the main source of nickel emissions (Defra, 2020), to help minimise nickel emissions in recent years and data in 2019 at all three monitoring locations shows annual mean nickel concentrations decreased in 2019, compared to 2018 (see Table 3). However, the annual mean nickel concentration at the Tawe Terrace monitor still exceeded the Target Value.
- 6.5 As detailed, in paragraph 4.2, there is understood to be an ongoing project between the Council, NRW and Wall Colmonoy with the aim of minimising nickel emissions further. The NPTCBC EHO

has stated that until any improvements have been implemented, and a demonstrable improvement in ambient nickel concentrations observed, they will maintain a standing objection against all residential development in Pontardawe.

Significance of Operational Air Quality Effects

6.6 The operational air quality effects without mitigation are judged to be 'not significant' in terms of impacts of the proposed development on existing receptors. However, there may be 'significant' impact on the future residents without mitigation due to the potential for exposure to nickel concentrations exceeding the Target Value for annual mean concentrations. This professional judgement is made in accordance with the methodology set out in Section 4, and takes account of the assessment that:

- the number of additional vehicle movements generated by the proposed development is expected to be well below the recognised screening criteria and associated impacts have been screened out as insignificant;
- nitrogen dioxide and particulate matter concentrations within the proposed development will be below the objectives, thus future residents will experience acceptable air quality in relation to nitrogen dioxide and particulate matter; and
- nickel concentrations within the proposed development site have the potential to exceed the Target Value and therefore future residents may experience unacceptable air quality in relation to nickel, without mitigation.

7 Mitigation

Existing Receptors

- 7.1 The assessment has demonstrated that the overall air quality effect of the proposed development on existing receptors will be 'not significant'; the proposed development-generated traffic emissions will not have a significant impact on local air quality. It is, therefore, not considered appropriate to propose mitigation measures in relation to road traffic for this development. Measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions standards, largely via European legislation (which is written into UK law).

Future Residents

- 7.2 The assessment found there is a risk that future residents may be exposed to nickel concentrations exceeding the Target Value. The issue relating to nickel concentrations in Pontardawe has been extensively reviewed by NPTCBC and it is understood that there is an ongoing project between the Council, Wall Colmonoy (the main source of nickel emissions) and NRW to further reduce nickel emissions from the site. Our report cannot place any obligations on third parties with regard to the nickel emissions associated with the Wall Colmonoy site. It is, however, noted that the stack heights at the Wall Colmonoy site appear to be relatively low and discharge below the height of the nearest building. Therefore, an increase to the stack heights at the Wall Colmonoy site is likely to be beneficial in helping the dispersion of emissions, although the challenging dispersion conditions of the valley are noted.
- 7.3 Given the potential for exposure of future residents to nickel concentrations exceeding the Target Value, it is recommended that a mechanical HVAC system is installed at the proposed development to provide appropriately filtered and conditioned air to all habitable rooms, without recourse to opening the windows. This ventilation system should include HEPA filters to minimise the particulate matter (and associated nickel) taken into the building. Such a system will also be required to meet the requirements of Part F of the Building Regulations (Welsh Government, 2017). The HVAC system will need to be adequately designed and maintained, including changeover of the HEPA filters as necessary.

8 Residual Impacts

- 8.1 The residual impacts on existing receptors will be the same as those identified in Section 6, i.e 'not significant'.
- 8.2 Future residents of the proposed development risk being exposed to exceedances of the annual mean nickel Target Value. Inclusion of a mechanical HVAC system with HEPA filters at the proposed development, will improve indoor air quality at these units. It is noted that residents will still have the option to open their windows and air entering the building through open windows will not have been filtered and may have elevated nickel concentrations. The Target Value, however, is based on an annual mean concentration and a mechanical HVAC system is likely to be in use for a significant proportion each year. Therefore, with an appropriately designed and maintained mechanical HVAC system with HEPA filters in use for a significant proportion of the year, the residual effects are judged to be not significant.

9 Conclusions

- 9.1 The assessment has considered the impacts of the proposed development on local air quality in terms of emissions from road traffic generated by the completed and occupied development. It has also identified the air quality conditions that future residents will experience.

Operational Impacts

Impacts

- 9.2 The proposed development is not expected to significantly increase the number of daily vehicle movements on any local road, relative to the existing use. It can thus be concluded that it will not have a significant impact on local air quality at existing receptors.
- 9.3 Air quality conditions for future residents of the proposed development have been shown to be acceptable for nitrogen dioxide and particulate matter concentrations. Predicted annual mean nickel concentrations at the proposed development exceed the Target Value in 2019 and, therefore, there may be significant impacts on future residents of the proposed development in relation to nickel concentrations.

Mitigation

- 9.4 Mitigation is recommended to be applied in the form of a mechanical HVAC system, with HEPA filters, in order to provide appropriately filtered and conditioned air to all habitable rooms, without recourse to opening the windows.

Significance

- 9.5 The overall operational air quality effects of the proposed development are judged to be 'not significant', provided mitigation is implemented.

Policy Implications

- 9.6 Taking into account these conclusions, it is judged that this assessment is consistent with Paragraph 3.2 of the PPW as it has considered the impacts of pollution from the proposed development on existing communities and has determined the proposed development will not have any significant adverse impacts on health of these existing communities in relation to air quality.
- 9.7 Paragraph 6.7.14 of the PPW details that *"Proposed development should be designed wherever possible to prevent adverse effects to amenity, health and the environment but as a minimum to limit or constrain any effects that do occur."* It has therefore been recommended that the proposed development design includes mechanical ventilation with HEPA filters to minimise intake of nickel to habitable areas of the proposed development.

- 9.8 The proposed development is consistent with point 1 of Policy SP16 of NPTCBC's Local Plan, as it will not have a significant detrimental effect on existing air quality. It is noted that the recommended mitigation, of mechanical ventilation with HEPA filters, is required to be consistent with point 3 of Policy SP16 and ensure there is no increase to the number of people exposed to significant levels of pollution. It is also noted that the extant permission for the existing building includes provision for residential occupation.

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11 Glossary

AADT	Annual Average Daily Traffic
ADMS-Roads	Atmospheric Dispersion Modelling System model for Roads
ADMS-5	Atmospheric Dispersion Modelling System model for point sources
AQAL	Air Quality Assessment Level
AQC	Air Quality Consultants
AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network
CAZ	Clean Air Zone
CHP	Combined Heat and Power
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EFT	Emission Factor Toolkit
EHO	Environmental Health Officer
EPUK	Environmental Protection UK
EU	European Union
EV	Electric Vehicle
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
HDV	Heavy Duty Vehicles (> 3.5 tonnes)
HGV	Heavy Goods Vehicle
HMSO	Her Majesty's Stationery Office
IAQM	Institute of Air Quality Management
JAQU	Joint Air Quality Unit
kph	Kilometres Per hour
kW	Kilowatt
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles (<3.5 tonnes)

LGV	Light Goods Vehicle
µg/m³	Microgrammes per cubic metre
NO	Nitric oxide
NO₂	Nitrogen dioxide
NO_x	Nitrogen oxides (taken to be NO ₂ + NO)
NRW	Natural Resources Wales
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
OLEV	Office for Low Emission Vehicles
PM₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM_{2.5}	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
PPW	Planning Policy Wales
SPG	Supplementary Planning Guidance
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
TAN	Technical Advice Note
TEA	Triethanolamine – used to absorb nitrogen dioxide
TEB	Transport Emissions Benchmark

12 Appendices

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A1 EPUK & IAQM Planning for Air Quality Guidance

- A1.1 The guidance issued by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) is comprehensive in its explanation of the place of air quality in the planning regime. Key sections of the guidance not already mentioned above are set out below.

Air Quality as a Material Consideration

“Any air quality issue that relates to land use and its development is capable of being a material planning consideration. The weight, however, given to air quality in making a planning application decision, in addition to the policies in the local plan, will depend on such factors as:

- *the severity of the impacts on air quality;*
- *the air quality in the area surrounding the proposed development;*
- *the likely use of the development, i.e. the length of time people are likely to be exposed at that location; and*
- *the positive benefits provided through other material considerations”.*

Recommended Best Practice

- A1.2 The guidance goes into detail on how all development proposals can and should adopt good design principles that reduce emissions and contribute to better air quality management. It states:

“The basic concept is that good practice to reduce emissions and exposure is incorporated into all developments at the outset, at a scale commensurate with the emissions”.

- A1.3 The guidance sets out a number of good practice principles that should be applied to all developments that:

- include 10 or more dwellings;
- where the number of dwellings is not known, residential development is carried out on a site of more than 0.5 ha;
- provide more than 1,000 m² of commercial floorspace;
- are carried out on land of 1 ha or more.

- A1.4 The good practice principles are that:

- New developments should not contravene the Council's Air Quality Action Plan, or render any of the measures unworkable;
- Wherever possible, new developments should not create a new “street canyon”, as this inhibits pollution dispersion;

- Delivering sustainable development should be the key theme of any application;
- New development should be designed to minimise public exposure to pollution sources, e.g. by locating habitable rooms away from busy roads;
- The provision of at least 1 Electric Vehicle (EV) “rapid charge” point per 10 residential dwellings and/or 1000 m² of commercial floorspace. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made available;
- Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety;
- All gas-fired boilers to meet a minimum standard of <40 mgNO_x/kWh;
- Where emissions are likely to impact on an AQMA, all gas-fired CHP plant to meet a minimum emissions standard of:
 - Spark ignition engine: 250 mgNO_x/Nm³;
 - Compression ignition engine: 400 mgNO_x/Nm³;
 - Gas turbine: 50 mgNO_x/Nm³.
- A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of 275 mgNO_x/Nm³ and 25 mgPM/Nm³.

A1.5 The guidance also outlines that offsetting emissions might be used as a mitigation measure for a proposed development. However, it states that:

“It is important that obligations to include offsetting are proportional to the nature and scale of development proposed and the level of concern about air quality; such offsetting can be based on a quantification of the emissions associated with the development. These emissions can be assigned a value, based on the “damage cost approach” used by Defra, and then applied as an indicator of the level of offsetting required, or as a financial obligation on the developer. Unless some form of benchmarking is applied, it is impractical to include building emissions in this approach, but if the boiler and CHP emissions are consistent with the standards as described above then this is not essential”.

A1.6 The guidance offers a widely used approach for quantifying costs associated with pollutant emissions from transport. It also outlines the following typical measures that may be considered to offset emissions, stating that measures to offset emissions may also be applied as post assessment mitigation:

- Support and promotion of car clubs;
- Contributions to low emission vehicle refuelling infrastructure;
- Provision of incentives for the uptake of low emission vehicles;
- Financial support to low emission public transport options; and
- Improvements to cycling and walking infrastructures.

Screening

Impacts of the Local Area on the Development

“There may be a requirement to carry out an air quality assessment for the impacts of the local area’s emissions on the proposed development itself, to assess the exposure that residents or users might experience. This will need to be a matter of judgement and should take into account:

- the background and future baseline air quality and whether this will be likely to approach or exceed the values set by air quality objectives;*
- the presence and location of Air Quality Management Areas as an indicator of local hotspots where the air quality objectives may be exceeded;*
- the presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular nitrogen dioxide), that would cause unacceptably high exposure for users of the new development; and*
- the presence of a source of odour and/or dust that may affect amenity for future occupants of the development”.*

Impacts of the Development on the Local Area

A1.7 The guidance sets out two stages of screening criteria that can be used to identify whether a detailed air quality assessment is required, in terms of the impact of the development on the local area. The first stage is that you should proceed to the second stage if any of the following apply:

- 10 or more residential units or a site area of more than 0.5 ha residential use; and/or
- more than 1,000 m² of floor space for all other uses or a site area greater than 1 ha.

A1.8 Coupled with any of the following:

- the development has more than 10 parking spaces; and/or
- the development will have a centralised energy facility or other centralised combustion process.

A1.9 If the above do not apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area. If they do apply then you proceed to stage 2, which sets out indicative criteria for requiring an air quality assessment. The stage 2 criteria relating to vehicle emissions are set out below:

- the development will lead to a change in LDV flows of more than 100 AADT within or adjacent to an AQMA or more than 500 AADT elsewhere;
- the development will lead to a change in HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;
- the development will lead to a realigning of roads (i.e. changing the proximity of receptors to traffic lanes) where the change is 5m or more and the road is within an AQMA;
- the development will introduce a new junction or remove an existing junction near to relevant receptors, and the junction will cause traffic to significantly change vehicle acceleration/deceleration, e.g. traffic lights or roundabouts;
- the development will introduce or change a bus station where bus flows will change by more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere; and
- the development will have an underground car park with more than 100 movements per day (total in and out) with an extraction system that exhausts within 20 m of a relevant receptor.

A1.10 The criteria are more stringent where the traffic impacts may arise on roads where concentrations are close to the objective. The presence of an AQMA is taken to indicate the possibility of being close to the objective, but where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate.

A1.11 On combustion processes (including standby emergency generators and shipping) where there is a risk of impacts at relevant receptors, the guidance states that:

“Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/sec 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. 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.

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.

Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable”.

- A1.12 Should none of the above apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area, provided that professional judgement is applied; the guidance importantly states the following:

“The criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive ‘trigger’ for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality”.

- A1.13 Even if a development cannot be screened out, the guidance is clear that a detailed assessment is not necessarily required:

“The use of a Simple Assessment may be appropriate, where it will clearly suffice for the purposes of reaching a conclusion on the significance of effects on local air quality. The principle underlying this guidance is that any assessment should provide enough evidence that will lead to a sound conclusion on the presence, or otherwise, of a significant effect on local air quality. A Simple Assessment will be appropriate, if it can provide this evidence. Similarly, it may be possible to conduct a quantitative assessment that does not require the use of a dispersion model run on a computer”.

- A1.14 The guidance also outlines what the content of the air quality assessment should include, and this has been adhered to in the production of this report.

Assessment of Significance

- A1.15 There is no official guidance in the UK in relation to development control on how to describe the nature of air quality impacts, nor how to assess their significance. The approach within the EPUK/IAQM guidance has, therefore, been used in this assessment. This approach involves a two stage process:

- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
- a judgement on the overall significance of the effects of any impacts.

- A1.16 The guidance recommends that the assessment of significance should be based on professional judgement, with the overall air quality impact of the development described as either ‘significant’ or ‘not significant’. In drawing this conclusion, the following factors should be taken into account:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts;
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts;
- the potential for cumulative impacts and, in such circumstances, several impacts that are described as '*slight*' individually could, taken together, be regarded as having a significant effect for the purposes of air quality management in an area, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a '*moderate*' or '*substantial*' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health; and
- the judgement on significance relates to the consequences of the impacts; will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in measurable changes in health outcomes that could be regarded as significant by health care professionals.

A1.17 The guidance is clear that other factors may be relevant in individual cases. It also states that the effect on the residents of any new development where the air quality is such that an air quality objective is not met will be judged as significant. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.

A1.18 A judgement of the significance should be made by a competent professional who is suitably qualified. A summary of the professional experience of the staff contributing to this assessment is provided in Appendix A2.

A2 Professional Experience

Adam Clegg, BSc (Hons) MEnvSc MIAQM

Mr Clegg is an Associate Director with AQC, with over 16 years' experience, specialising in industrial emissions. He is a Member of the Institute of Air Quality Management, has previously contributed his time to, and authored publications on behalf of, the Energy Institute's Emissions Working Group, and has acted as peer reviewer for the Journal of Air & Waste Management. His expertise includes ambient and stack emissions monitoring, emission inventory development and reporting, atmospheric dispersion modelling, abatement of air emissions, environmental permitting, Best Available Technique (BAT) assessments, cost-benefit analysis and compliance assessment. He has extensive experience in the quantification and assessment of emissions from a variety of releases, covering point source emissions, flare emissions, fugitive emissions and emissions from mobile transport sources, including marine vessels, on-road and off-road vehicles and rail locomotives. He has detailed knowledge of the technologies and techniques to reduce concentrations of combustion and non-combustion related pollutants, including oxides of nitrogen, acid gases (e.g., SO₂, HF, HCl), volatile organic compounds (VOCs), particulates, heavy metals and odour.

Dr Denise Evans, BSc (Hons) PhD MEnvSc MIAQM

Dr Evans is an Associate Director with AQC, with more than 21 years' relevant experience. She has prepared air quality review and assessment reports for local authorities, and has appraised local authority air quality assessments on behalf of the UK governments, and provided support to the Review and Assessment helpdesk. She has extensive modelling experience, completing air quality and odour assessments to support applications for a variety of development sectors including residential, mixed use, urban regeneration, energy, commercial, industrial, and road schemes, assessing the effects of a range of pollutants against relevant standards for human and ecological receptors. Denise has acted as an Expert Witness and is a Member of the Institute of Air Quality Management.

Anna McMahon, BSc (Hons) MSc CEnv MEnvSc MIAQM

Ms McMahon is a Principal Consultant with AQC, with more than 10 years' experience in the field of air quality management and assessment. She has undertaken air quality assessments for a range of sectors including residential, commercial, industrial and highways. She has extensive experience of quantitative methods to assess road traffic and stationary source emissions utilising detailed dispersion modelling software such as ADMS Roads, ADMS-5 and Breeze AERMOD, for both planning and permitting purposes. She also has experience in ambient air quality monitoring, the analysis and interpretation of air quality monitoring data, the assessment of nuisance dust and odours and indoor air quality for BREEAM. Anna is a Member of the Institute of Air Quality Management and is a Chartered Environmentalist.