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HAFOD

ABERTHIN ROAD, COWBRIDGE

AIR QUALITY ASSESSMENT

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HAFOD

ABERTHIN ROAD, COWBRIDGE

AIR QUALITY ASSESSMENT

JULY 2019

PREPARED BY:

Philip Walton AIAQM,
AMIEnvSc

Senior Environmental
Scientist (Air Quality)



REVIEWED & APPROVED BY:

Malcolm Walton MCIEH

Technical Director



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EXECUTIVE SUMMARY

An air quality assessment has been undertaken to accompany a detailed planning application for a proposed residential development off Aberthin road, Cowbridge. The proposed development will comprise of circa 48 residential dwellings.

During the construction phase, the risk of dust soiling effects is classed as low for demolition, medium for earthworks and construction and low for trackout. The risk of fine particulate matter human health effects is classed as negligible for demolition and trackout, and low for earthworks and construction. Mitigation measures are proposed to reduce any potential impacts based on best practice guidance

A review of local air quality and the traffic generation has been undertaken which determine the operational phase air quality effects would be negligible and not significant. 138 daily vehicle movements would be created by the development, which is well below the 500-movements criterion for a detailed assessment consideration.

The assessment has demonstrated that the proposed development will not lead to an unacceptable risk from air pollution. Therefore, there are no material reasons in relation to air quality why the proposed scheme should not proceed, subject to appropriate planning conditions.

1 INTRODUCTION

1.1 Background

- 1.1.1 Wardell Armstrong LLP (WA) has been commissioned by Hafod to undertake an air quality assessment to accompany a detailed planning application for a proposed residential development. The application is for circa 48 residential dwellings off Aberthin Road, Cowbridge, with associated parking and access to Aberthin Road.
- 1.1.2 An abandoned building is currently present at the site, which would be demolished as part of these proposals. The A48 flyover is adjacent to the north of the site and existing residential dwellings are present to the east, south and west.
- 1.1.3 This report details the results of the air quality assessment to accompany a detailed planning application for the proposed development. The report discusses the potential dust and fine particulate matter impacts associated with the construction phase, and a discussion of the potential air quality effects associated with vehicle emissions in the operational phase.

2 LEGISLATION AND POLICY CONTEXT

2.1 Relevant Air Quality Legislation and Guidance

2.1.1 The air quality assessment has been undertaken in accordance with the following legislation and guidance:

- EU Ambient Air Quality Directive 2008/50/EC (i.e. the CAFE Directive);
- The Environment Act 1995;
- Department of Environment, Food and Rural Affairs, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, July 2007;
- The Air Quality (Wales) (Amendment) Regulations 2002
- The Air Quality Standards Regulations 2010
- Tackling Roadside nitrogen dioxide concentrations in Wales, Interim Welsh Government supplemental plan to the UK plan for tackling roadside nitrogen dioxide concentrations, 2018;
- Department for Environment, Food and Rural Affairs, Local Air Quality Management Technical Guidance LAQM.TG(16), February 2018;
- Welsh Government, Planning Policy Wales, November 2016.

2.1.2 Further details of these documents are included in **Appendix A**.

2.2 Assessment Criteria

2.2.1 The relevant air quality objectives and limit values for this assessment are included within Table 1.

Table 1: Air Quality Objectives and Limit Values Relevant to the Assessment*			
Pollutant	Objective/Limit Value	Averaging Period	Obligation
Nitrogen Dioxide (NO ₂)	200µg/m ³ , not to be exceeded more than 18 times a year	1-hour mean	All local authorities
	40µg/m ³	Annual mean	All local authorities
Particulate Matter (PM ₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	England, Wales and Northern Ireland
	40µg/m ³	Annual mean	England, Wales and Northern Ireland
	18µg/m ³	Annual mean	Scotland only

Table 1: Air Quality Objectives and Limit Values Relevant to the Assessment*			
Pollutant	Objective/Limit Value	Averaging Period	Obligation
Particulate Matter (PM _{2.5})	Limit Value of 25µg/m ³	Annual mean	England, Wales and Northern Ireland
	10µg/m ³	Annual mean	Scotland only
<i>*In accordance with the Air Quality (Wales) (Amendment) Regulations 2002 and Air Quality Standards Regulations 2010</i>			

2.2.2 Further details of where these objectives and limit values apply are detailed in **Appendix A.**

3 ASSESSMENT METHODOLOGY

3.1 Consultation and Scope of Assessment

3.1.1 The assessment methodology was discussed and agreed with Mr Craig Lewis (Specialist Service Officer – Environment). Mr Lewis is based in Cardiff City Council, however there is a shared environmental regulatory service between Bridgend, Cardiff and the Vale of Glamorgan local authorities in South Wales. The methodology was discussed and agreed via email correspondence from 20th to 21st June 2019.

3.1.2 A summary of the consultation undertaken is provided in Table 2.

Table 2: Summary of Consultation		
Assessment Stage	Proposed Method	Response
Construction phase assessment to consider dust and fine particulate matter (PM ₁₀)	Qualitative assessment in accordance with Institute of Air Quality Management (IAQM) guidance	No objection to method
Operational phase assessment – screen out	Proposal and reasoning provided to screen out a detailed vehicle emissions assessment using ADMS-Roads. Instead a qualitative discussion would be provided in the report. Vehicle generation – the development would create 138 Annual Average Daily Traffic (AADT) total. These would reduce by approximately 50% as they travel north and south from the site exit, at Aberthin Road.	Agreement to screen out operational effects.

3.1.3 The details for carrying out screening assessment of operational phase are outlined further into this report.

3.2 Construction Phase Impacts

3.2.1 To assess the impacts associated with dust and fine particulate matter releases during the construction phase of the development, an assessment has been undertaken in accordance with guidance from the Institute of Air Quality Management (IAQM)¹. Further details of the construction assessment methodology are provided in **Appendix B**.

¹ Institute of Air Quality Management, Guidance on the Assessment of Dust from Demolition and Construction, February 2014

3.2.2 The closest sensitive human receptors to where construction phase activities will take place is at residential dwellings, which are detailed in Table 3.

Table 3: Existing Sensitive Receptors Considered in the Construction Phase Assessment		
Receptor	Direction from the Site	Approximate Distance from the Site Boundary (m)
Existing Residential Dwellings at Aberthin Road	East	Approximately 24m at closest point
Existing Residential Dwellings at Slade Close	South	Adjacent
Existing Residential Dwellings at Millfield Drive	West	Adjacent

3.2.3 There are no ecological receptors, or potentially dust sensitive statutory designated habitat sites, within 50m of the site and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s). Ecological effects do not therefore need to be considered within this assessment.

3.2.4 The criteria used to assess the construction impact of the proposed development, and the associated significance of effects at existing sensitive receptors, are included in **Appendix B**.

4 BASELINE SITUATION

4.1 Vale of Glamorgan Council Local Air Quality Management

- 4.1.1 The proposed development site is located within the administrative area of the Vale of Glamorgan Council (VGC), which is responsible for the management of local air quality.
- 4.1.2 VGC has declared one air quality management area (AQMA), which is located at Windsor Road, Penarth. The AQMA is approximately 17km to the east and would therefore not be affected by the proposals.
- 4.1.3 VGC operates three nitrogen dioxide diffusion tubes along the High Street in Cowbridge (ID's 54, 65, 101). These three monitors recorded 2017 NO₂ concentrations of 19.50µg/m³, 15.20µg/m³ and 19.90µg/m³.
- 4.1.4 NO₂ concentrations in Cowbridge are therefore low and the local area can be described as having relatively good air quality.

4.2 Background Air Pollutant Concentrations

- 4.2.1 Background pollutant concentrations at the development site are outlined in Table 4. As there are no representative NO₂, PM₁₀ or PM_{2.5} monitoring locations in the vicinity of the proposed development site, background concentrations have been obtained from the 2017-based Defra default concentration maps, for the appropriate grid square². Pollutants concentrations in the surrounding grid squares are relatively similar.
- 4.2.2 The A48 is located to the north of the proposed development site and is included in the same grid square as the site. Pollutant contributions from this pollutant source are therefore included in the background concentration data.
- 4.2.3 The background pollutant concentrations used in this assessment are detailed in Table 4.

Pollutant	2019 Annual Mean Concentrations (µg/m³)
Oxides of Nitrogen (NO _x)	7.75
Nitrogen Dioxide (NO ₂)	6.01

² Accessed through the Defra Local Air Quality Management webpages (<http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>)

Table 4: Background Pollutant Concentrations Used in the Air Quality Assessment, at grid square x: 300500, y: 174500	
Pollutant	2019 Annual Mean Concentrations ($\mu\text{g}/\text{m}^3$)
Particulate matter (PM ₁₀)	9.76
Particulate matter (PM _{2.5})	6.42

5 CONSTRUCTION IMPACT ASSESSMENT

5.1 Construction Phase

Step 1 – Requirement for Assessment

5.1.1 Sensitive receptors are present within 350m of future construction activities.

Step 2 – Impact Assessment

5.1.2 In accordance with the IAQM guidance, the main activities to be considered during the construction phase of the proposed development are demolition, earthworks, construction and trackout.

5.1.3 Demolition involves the tearing down of the building and associated structures, often undertaken by plant equipment and careful deconstruction activities to preserve and re-use material, however explosive charges are also an option in some cases. Earthworks covers the processes of soil-stripping, ground-levelling, excavation and landscaping. Construction activities will focus on the proposed buildings, access roads car parking areas. Trackout is defined as the transport of dust and dirt by vehicles travelling from a construction site on to the public road network. This may occur through the spillage of dusty materials onto road surfaces or through the transportation of dirt by vehicles that have travelled over muddy ground on the site. This dust and dirt can then be deposited and re-suspended by other vehicles.

Step 2A

5.1.4 Step 2A of the assessment defines the potential dust emission magnitude from earthworks, construction and trackout in the absence of site specific mitigation.

5.1.5 Examples of the criteria for the dust emission classes are detailed in **Appendix B**. The results of this step are detailed in Table 5.

Step 2B

5.1.6 Step 2B of the construction phase dust assessment defines the sensitivity of the area, taking into account the significance criteria detailed in **Appendix B**, for earthworks, construction and trackout. The sensitivity of the area to each activity is assessed for potential dust soiling, human health effects and ecological effects.

5.1.7 The demolition activities would be undertaken using plant equipment and by deconstruction measures. For demolition, there are currently between 10 and 100 highly sensitive residential receptors within 50m of where these activities

may take place. The building to be demolished is located between 20 to 50m from the site boundary.

5.1.8 For earthworks and construction, there are currently between 10 and 100 highly sensitive residential receptors within 20m of where these activities may take place, which is assumed to be the site boundary for the purposes of this assessment.

5.1.9 The routing of construction vehicles is not known, however it is assumed vehicles would travel south as this offers more direct links out of Cowbridge. For trackout, there are 1 to 10 highly sensitive residential receptors located within 20m of the road where trackout may occur, for a distance of up to 200m from the site entrance. The sites earthwork area is a medium classification, therefore trackout is assessed up to 200m, in accordance with the IAQM Dust Guidance.

Step 2C

5.1.10 Step 2C of the construction phase dust assessment defines the risk of impacts from each activity, by combining the dust emission magnitude with the sensitivity of the surrounding area.

5.1.11 The risk of dust impacts from each activity, with no mitigation in place, has been assessed in accordance with the criteria detailed in **Appendix B**. The results of this step are detailed in Table 5.

Summary of Step 2

5.1.12 Table 5 details the results of Step 2 of the construction phase assessment for human receptors.

Table 5: Construction Phase Dust Assessment for Human Receptors				
	Activity			
	Demolition	Earthworks	Construction	Trackout
Step 2A				
Dust Emission Magnitude	Small ^a	Medium ^b	Medium ^c	Small ^d
Step 2B				
Sensitivity of Closest Receptors	High	High	High	High
Sensitivity of Area to Dust Soiling Effects	Medium	High	High	Medium

Table 5: Construction Phase Dust Assessment for Human Receptors				
	Activity			
	Demolition	Earthworks	Construction	Trackout
Sensitivity of Area to Human Health Effects	Low ^e	Low ^e	Low ^e	Low ^e
Step 2C				
Dust Risk: Dust Soiling	Low Risk	Medium Risk	Medium Risk	Negligible Risk
Dust Risk: Human Health	Negligible Risk	Low Risk	Low Risk	Negligible Risk
a. Total building volume to be demolished estimated to be less than 20,000m ³ (assuming a 58*17*6m building volume estimation, measured from aerial imagery). b. Total site area estimated to be between 2,500 to 10,000m ² c. Total construction volumes estimated to be between 25,000m ³ and 100,000m ³ , with potentially dusty construction materials d. Number of one-way construction phase vehicles estimated to be less than 10 per day. Journey distances around the site are expected to be less than 50m. e. Background annual mean PM ₁₀ concentration are less than 24 µg/m ³ in 2019, as shown in Table 4				

Step 3 – Mitigation

5.1.13 During the construction phase, the implementation of effective mitigation measures will substantially reduce the potential for nuisance dust and particulate matter to be generated.

5.1.14 Step 2C of the assessment has identified that the risk of dust soiling and human health effects is not negligible for earthworks and construction and therefore site-specific mitigation will need to be implemented to ensure dust effects from these activities will be not significant.

Recommendations for Site-Specific Mitigation

5.1.15 Specific mitigation relating to dust control may be in the form of construction best practices or could include a dust management plan. Recommendations for mitigation within the IAQM guidance include:

- Soft strip inside all buildings before demolition occurs;
- Ensure water suppression is used during the demolition activities. Specially fitted water suppression on equipment is ideal but a hose and dampening down during demolition would suffice;
- Advisory – prior to demolition the presence of asbestos should be determined. If asbestos was present, this should be removed prior to demolition by a

suitably qualified professional.

- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust soiling and airborne dust and record inspection results;
- Only remove the cover in small areas during work and not all at once;
- Dampening down of exposed surfaces and stockpiles, which will be stored as far from sensitive receptors as possible. Road surfaces shall also be dampened down as necessary;
- Avoid site runoff of water or mud;
- Cover and seed stockpiles to prevent wind whipping, where applicable;
- Stockpile heights should not exceed the height of the existing boundary fencing, to prevent wind whipping;
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- Avoidance of activities that generate large amounts of dust during windy conditions;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery;
- No burning of waste (including greenery);
- Ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport;
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site.
- Minimisation of vehicle movements and limitation of vehicle speeds – the slower the vehicle speeds, the lower the dust generation;

5.1.16 All dust and air quality complaints should be recorded and appropriate measures be taken to identify causes and reduce emissions in a timely manner. Exceptional incidents which cause dust and/or emissions, and the action taken to resolve the

situation, should be recorded in a log book and made available to VGC on request.

- 5.1.17 It is recognised that the final design solutions will be developed with the input of the Contractor to maximise construction efficiencies, to use modern construction techniques and sustainable materials and to incorporate the particular skills and experience offered by the appointed contractor.

Step 4 – Residual Effects

- 5.1.18 Step 4 of the construction phase dust assessment has been undertaken to determine the significance of the dust effects arising from earthworks, construction and trackout associated with the proposed development.
- 5.1.19 The implementation of effective mitigation measures during the construction phase, such as those detailed in Step 3, will substantially reduce the potential for nuisance dust and particulate matter to be generated and any residual impact should be not significant.

6 OPERATIONAL PHASE DISCUSSION

6.1 Introduction

- 6.1.1 Following agreement with VGC, a detailed air quality assessment for the operational phase vehicle emissions has been scoped out. Operational effects are deemed to be negligible and not significant.
- 6.1.2 A qualitative assessment has been undertaken to discuss the air quality effects at existing and proposed residential sensitive receptors, taking into account proposed vehicle generation and a review of local air quality.

6.2 Traffic Data

- 6.2.1 The proposed development will generate 138 daily vehicle movements, as confirmed by Calibro Consultants, the appointed transport consultants for the scheme.
- 6.2.2 The Environmental Protection UK 'Land-use Planning & Development & Development Control: Planning for Air Quality' 2017 guidance document specifies a detailed air quality assessment should be considered where more than 500 AADT is created by the development, outside an air quality management area. A requirement for assessment is therefore not met. Air quality effects to existing residential receptors along roads subject to increased vehicle flows are considered to be negligible and not significant.
- 6.2.3 The predicted routing and generation from the development is displayed in Plate 1.



Plate 1: Predicted Vehicle Routing from the Proposed Development

6.3 A48 Roadside Emissions

- 6.3.1 A flyover of the A48 borders the development to the north. The flyover height would be above the proposed residential property heights. Vehicle emissions are transported away and upwards from the vehicles, therefore elevated air quality roadside concentrations are considered to be negligible and not significant.

Background pollutants concentrations are also very low, which ensures there is a low risk of adverse air quality at future residential receptors.

7 CONCLUSIONS

7.1 Construction Phase

7.1.1 The construction phase assessment has been undertaken to determine the risk and significance of dust and fine particulate matter effects from earthworks, construction and trackout associated with the proposed development, in accordance with guidance published by the IAQM.

7.1.2 With site specific mitigation measures in place, the significance of dust and fine particulate effects from earthworks, construction and trackout is considered to be not significant.

7.2 Operational Phase

7.2.1 The proposed development will generate 138 daily vehicle movements, which is well below the criterion for a detailed air quality assessment. Air quality changes at existing sensitive receptors along the vehicle movement network can therefore be considered to be negligible and not significant.

7.2.2 Background pollutant concentrations in Cowbridge are low and local air quality is considered to be relatively good.

7.3 Summary

7.3.1 The assessment has demonstrated that the proposed development will not lead to an unacceptable risk from air pollution, nor will it lead to any breach of national objectives as required by national policy. There are no material reasons in relation to air quality why the proposed scheme should not proceed.

APPENDICES

Appendix A: Air Quality Legislation and Guidance

European Legislation

- A.1 The European Union (EU) Ambient Air Quality Directive 2008/50/EC¹ (i.e. the CAFE Directive) came into force in June 2008. This EU Directive consolidates previous air quality legislation, with the exception of the 4th daughter Directive², and sets air quality limit values for seven pollutants. The Directive also provides a regulatory framework for fine particulate matter smaller than 2.5µm in diameter (PM_{2.5}).
- A.2 EU Directive 2008/50/EC was transposed into legislation in the UK on 11th June 2010 as The Air Quality Standards Regulations 2010³.

National Air Quality Strategy

- A.3 The Environment Act 1995 requires the UK government to prepare a national Air Quality Strategy. The first UK strategy was published in March 1997, setting out policies for the management of ambient air quality. This was subsequently updated in 2007⁴.
- A.4 The 2007 strategy establishes the framework for air quality management in England, Scotland, Wales and Northern Ireland. Air quality standards and objectives are set out for eight pollutants which may potentially occur at levels that give cause for concern. The strategy also provides details of the role that local authorities are required to take in working towards improvements in air quality, known as the Local Air Quality Management (LAQM) regime.

Air Quality Standards and Objectives

- A.5 Air quality standards and objectives are set out in the strategy for the following pollutants: nitrogen dioxide (NO₂), sulphur dioxide (SO₂), carbon monoxide (CO), lead (Pb), fine particulate matter (PM₁₀), benzene (C₆H₆), 1, 3-butadiene (C₄H₆) and ozone (O₃).

¹ Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

² Directive 2004/107/EC of the European Parliament and the Council of 15th December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air

³ The Air Quality Standards Regulations 2010

⁴ Department of Environment, Food and Rural Affairs, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. July 2007

A.6 Objectives for each pollutant, except O₃, were first given statutory status in the Air Quality Regulations 2000⁵ and Air Quality (Amendment) Regulations 2002⁶. These objectives are defined in the strategy as:

“the maximum ambient concentration not to be exceeded, either without exception or with a permitted number of exceedances, within a specified timescale.”

A.7 The EU limit values, transposed into UK legislation as The Air Quality Standards Regulations 2010, are mostly the same as the air quality objectives in terms of concentrations; however, there are differences in determining how compliance is achieved.

A.8 Whilst there is no specific objective for PM_{2.5} in England and Wales, a limit value of 25µg/m³ is referred to in the 2010 regulations, which has been adopted for use in this assessment (as recommended by the LAQM Helpdesk). An objective has been set for PM_{2.5} in Scotland since early 2016.

A.9 Examples of where these objectives and limit values apply are detailed in the Defra LAQM Technical Guidance document LAQM.TG(16)⁷ and are included in Table A1.

Averaging Period	Objectives Should Apply at:	Objectives Should Generally Not Apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes, etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean and 8-hour mean	All locations where the annual mean objectives would apply, together with hotels. Gardens of residential properties ^a	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term

⁵ The Air Quality Regulations 2000. SI No 928

⁶ The Air Quality (Wales) (Amendment) Regulations 2002

⁷ Department for Environment, Food and Rural Affairs, Local Air Quality Management Technical Guidance LAQM.TG(16), February 2018

Table A1: Examples of Where the Air Quality Objectives Should Apply		
Averaging Period	Objectives Should Apply at:	Objectives Should Generally Not Apply at:
1-hour mean	All locations where the annual mean and 24 and 8-hour objectives apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations to which the public might reasonably be expected to spend one hour or longer	Kerbside sites where public would not be expected to have regular access
15-minute mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer	
<p><i>^a Such locations should represent parts of the garden where relevant public exposure is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure to pollutants would occur at the extremities of the garden boundary, or in front gardens, although local judgement should always be applied</i></p>		

Local Air Quality Management

- A.10 LAQM legislation in the Environment Act 1995 requires local authorities to conduct the periodic review and assessments of air quality. These aim to identify all those areas where the objectives are being, or are likely to be, exceeded. Where exceedances are likely to occur, local authorities are required to declare an Air Quality Management Area (AQMA).
- A.11 LAQM.TG(16) presents a streamlined approach for LAQM in England and Scotland; however, Wales and Northern Ireland are still considering changes to LAQM and therefore work according to the previous regimes.
- A.12 Local authorities in England are required to produce Annual Status Reports (ASRs), and in Scotland, Annual Progress Reports (APRs). These replace all other reports which previously had to be submitted including Updating and Screening Assessments, Progress Reports and Detailed Assessments (which would be produced to assist with an AQMA declaration).
- A.13 Local authorities now have the option of a fast track AQMA declaration option. This allows more expert judgement to be used and removes the need for a Detailed Assessment where a local authority is confident of the outcome. Detailed Assessments should however still be used if there is any doubt.

- A.14 As part of the UK Government's requirement to improve air quality, selected local authorities in England are also currently investigating the feasibility of setting up Clean Air Zones (CAZs). These are areas where targeted action and co-ordinated resources aim to improve air quality within an urban setting, in order to achieve compliance with the EU limit values within the shortest possible time.
- A.15 In Wales, Cardiff were instructed to prepare CAZ studies, however following a review Cardiff City Council is progressing with air quality funding of mitigation rather than the implementation of a CAZ.

Planning Policy Wales

- A.16 Planning Policy Wales (PPW) introduced in 2014, and its updates (most recent being Edition 8, January 2016) provide the strategic policy framework for the preparation of Local Authority development plans. The PPW is supported by 21 Technical Advice Notes (TANs) and the National Assembly for Wales Circulars. In preparing local development plans, the Welsh Local Authorities take into account PPW, TANs and the Welsh Circulars.
- A.17 Paragraph 13.12.1 of the PPW makes specific reference to air quality. The paragraph outlines the material considerations, for air and water, which should be accounted for when deciding whether or not permission should be granted:
- location;
 - impact on health and amenity;
 - the risk and impact of potential pollution from the proposed development (particularly if the development will impact on air quality management areas);
 - prevention of nuisance;
 - impact on road and other transport networks, and in particular traffic generation;
 - and
- A.18 Paragraphs 13.12.2 and 13.12.3 then go on to state that developments should not be capable of causing adverse pollution and that in order to protect the environment, the Local Authority may impose planning conditions or obligations on the development proposed.

- A.19 TAN 18^[8] makes specific reference to air quality. When considering planning applications, the Planning Authority should take into account air quality management areas and air quality action plans when coming to a planning decision.
- A.20 The overall theme of the Welsh planning policy, for air quality, places a general presumption on sustainable development, a reliance on local development plans and ensuring the planning system has an important role in minimising pollution. The need for compliance with air quality standards and objectives, and the importance of not contributing to adverse air quality in already declared air quality management areas is also stressed.
- A.21 The Cardiff Local Development Plan 2006 – 2026^[9] provides further guidance in relation to air quality considerations in planning applications. The following is extracted from paragraph 5.192 of the Plan:

“In determining planning applications, consideration will be given to a development’s likely effect in terms of air pollution it may cause directly, but also in terms of any increase or decrease in traffic it may generate. Where a development is likely to affect air quality significantly (i.e. where air quality standards are, or are likely to be breached or a new residential development gives rise to the need for a new Air Quality Management Area to be declared by introducing residents to areas where air quality standards are already being breached) then an application may be approved subject to conditions mitigating its impact on air quality, or refused where appropriate.”

⁸ Welsh Assembly Government, March 2007. Technical Advice Note 18: Transport

⁹ City of Cardiff Council, September 2013. Cardiff Local Development Plan 2006 – 2026

Appendix B: Methodology for Construction Phase Assessment

Institute of Air Quality Management Guidance

B.1 The methodology for the construction phase dust assessment is set out in guidance from the Institute of Air Quality Management (IAQM)¹⁰.

Step 1

B.2 Step 1 is to screen the requirement for a more detailed assessment. The guidance states that an assessment will normally be required where there are existing sensitive human receptors within 350m of the site boundary and/or within 100m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

B.3 With regards to ecological receptors, the guidance states that an assessment will normally be required where there are existing receptors within 50m of the site boundary and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

B.4 Where any of these criteria are met, it is necessary to proceed to Step 2.

Step 2

B.5 Step 2 determines the potential risk of dust arising in sufficient quantities to cause annoyance and/or health or ecological impacts. The risk is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc);
- The duration of these activities;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activity;
- The adequacy of the mitigation measures applied to reduce or eliminate dust;
- and
- The sensitivity of receptors to dust.

B.6 The risk of dust impacts is determined using four risk categories: negligible, low, medium and high risk. A site is allocated to a risk category based upon the following two factors (known as Step 2A and Step 2B).

¹⁰ Institute of Air Quality Management, Guidance on the Assessment of Dust from Demolition and Construction, February 2014

B.7 **Step 2A** assesses the scale and nature of the works which determines the potential dust emission magnitude as small, medium or large. Examples of how the magnitude may be defined are included in Table B1.

Table B1: Determining the Dust Emission Magnitude of Construction Phase Activities			
Activity	Dust Emission Class		
	Large	Medium	Small
Demolition	Total building volume >50,000m ³ ; Potentially dusty construction material (e.g. concrete); On-site crushing and screening; Demolition activities >20m above ground level	Total building volume 20,000-50,000m ³ ; Potentially dusty construction material; Demolition activities 10-20m above ground level	Total building volume <20,000m ³ ; Construction material with low potential for dust release (e.g. metal cladding or timber)
Earthworks	Total site area >10,000m ² ; Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size); >10 heavy earth moving vehicles active at any one time; Formation of bunds >8m in height; Total material moved >100,000 tonnes	Total site area 2,500-10,000m ² ; Moderately dusty soil type (e.g. silt); 5-10 heavy earth moving vehicles active at any one time; Formation of bunds 4-8m in height; Total material moved 20,000-100,000 tonnes	Total site area <2,500m ² ; Soil type with large grain size (e.g. sand); <5 heavy earth moving vehicles active at any one time; Formation of bunds <4m in height; Total material moved <20,000 tonnes; Earthworks during wetter months
Construction	Total building volume >100,000m ³ ; On-site concrete batching; Sandblasting	Total building volume 25,000-100,000m ³ ; Potentially dusty construction material (e.g. concrete); On-site batching	Total building volume <25,000m ³ ; Construction material with a low potential for dust release (e.g. metal cladding or timber)
Trackout	>50 HDV (>3.5t) outward movements ^a in any one day ^b ; Potentially dusty surface material (e.g. high clay content); Unpaved road length >100m	10-50 HDV (>3,5t) outward movements ^a in any one day ^b ; Moderately dusty surface material (e.g. high clay content); Unpaved road length 50-100m	<10 HDV (>3.5t) outward movements ^a in any one day ^b ; Surface material with low potential for dust release; Unpaved road length <50m
<p><i>a. A vehicle movement is a one way journey i.e. from A to B, and excludes the return journey</i> <i>b. HDV movements during a construction project may vary over its lifetime, and the number of movements is the maximum not the average</i></p>			

B.8 **Step 2B** considers the sensitivity of the area to dust impacts which is defined as low, medium or high. The sensitivity categories for different types of receptors are described in Table B2.

Table B2: Sensitivity Categories for Dust Soiling, Human Health and Ecological Effects			
Sensitivity Category	Dust Soiling Effects	Health effects of PM₁₀	Ecological Effects
High	<p>Users can reasonably expect to enjoy a high level of amenity; Appearance, aesthetics or value of a property would be diminished; Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car show rooms</p>	<p>Locations where members of the public are exposed over a period of time relevant to the air quality objective for PM₁₀; Examples include residential properties, hospitals, schools, and residential care homes</p>	<p>Locations with an international or national designation and the designated features may be affected by dust soiling; Locations where there is a community of a particularly dust sensitive species; Examples include a Special Area of Conservation with dust sensitive features</p>
Medium	<p>Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; The appearance, aesthetics or value of their property could be diminished; People or property wouldn't reasonably be expected to be continuously present or regularly for extended periods of time; Examples include parks and places of work</p>	<p>Locations where people are exposed as workers and exposure is over a period of time relevant to the air quality objective for PM₁₀; Examples include office and shop workers but will generally not include workers occupationally exposed to PM₁₀</p>	<p>Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; Locations with a national designation where the features may be affected by dust deposition; Examples include a Site of Special Scientific Interest with dust sensitive features</p>
Low	<p>Enjoyment of amenity would not reasonably be expected; Property would not be diminished in appearance, aesthetics or value; People or property would be expected to be present only for limited periods of time; Examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads</p>	<p>Locations where human exposure is transient; Examples include public footpaths, playing fields, parks and shopping streets</p>	<p>Locations with a local designation where the features may be affected by dust deposition; Examples include a Local Nature Reserve with dust sensitive features</p>

B.9 Based on the sensitivity of individual receptors, the overall sensitivity of the area to dust soiling, human health and ecological effects is then determined using the criteria detailed in Tables B3 to B5, respectively.

Table B3: Sensitivity of the Area to Dust Soiling Effects on People and Property ^{ab}					
Receptor Sensitivity	Number of Receptors	Distance from Source (m) ^c			
		<20m	<50m	<100m	<350m
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

a. The sensitivity to the area should be derived for each of the four activities
b. Estimate the total number of receptors within the stated distance. Only the highest level of sensitivity from the table needs to be considered
c. For trackout, distances should be measured from the side of the roads used by construction traffic. Without site specific mitigation, trackout may occur for up to 500m from large sites, 200m from medium sites and 50m from small sites, measured from the site exit. The impact declines with distance from the site and it is only necessary to consider trackout impacts up to 50m from the edge of the road

Table B4: Sensitivity of the Area to Human Health Impacts ^{ab}							
Receptor Sensitivity	Annual Mean PM ₁₀ Concentration ^c	Number of Receptors ^d	Distance from Source (m) ^e				
			<20m	<50m	<100m	<200m	<350m
High	>32µg/m ³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32µg/m ³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28µg/m ³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24µg/m ³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low

Table B4: Sensitivity of the Area to Human Health Impacts ^{ab}							
Receptor Sensitivity	Annual Mean PM ₁₀ Concentration ^c	Number of Receptors ^d	Distance from Source (m) ^e				
			<20m	<50m	<100m	<200m	<350m
Medium	>32µg/m ³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32µg/m ³	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24µg/m ³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

a. The sensitivity to the area should be derived for each of the four activities
 b. Estimate the total number of receptors within the stated distance. Only the highest level of sensitivity from the table needs to be considered
 c. Most straightforwardly taken from the national background maps, but should also take account of local sources. The values are based on 32µg/m³ being the annual mean concentration at which an exceedance of the 24-hour mean objective is likely in England, Wales and Northern Ireland. In Scotland, there is an annual mean objective of 18µg/m³
 d. In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, just include the number of properties
 e. For trackout, distances should be measured from the side of the roads used by construction traffic

Table B5: Sensitivity of the Area to Ecological Impacts ^{ab}		
Receptor Sensitivity	Distance from the Source (m) ^c	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

a. The sensitivity to the area should be derived for each of the four activities
 b. Only the highest level of sensitivity from the table needs to be considered
 c. For trackout, distances should be measured from the side of the roads used by construction traffic

B.10 These two factors are combined in **Step 2C** to determine the risk of dust impacts with no mitigation applied.

B.11 The risk of dust effects is determined for four types of construction phase activities, with each activity being considered separately. If a construction phase activity is not

taking place on the site, then it does not need to be assessed. The four types of activities to be considered are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

B.12 The risk of dust being generated by demolition activities at the site is determined using the criteria in Table B6.

Table B6: Risk of Dust Impacts for Demolition			
Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

B.13 The risk of dust being generated by earthworks and construction at the site is determined using the criteria in Table B7.

Table B7: Risk of Dust Impacts for Earthworks and Construction			
Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

B.14 The risk of dust being generated by trackout at the site is determined using the criteria in Table B8.

Table B8: Risk of Dust Impacts for Trackout			
Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Medium Risk	Low Risk	Negligible

Step 3

- B.15 Step 3 of the assessment determines the site-specific mitigation required for each of the activities, based on the risk determined in Step 2. Mitigation measures are detailed in guidance published by the Greater London Authority¹¹, recommended for use outside the capital by LAQM guidance, and the IAQM guidance document itself. Professional judgement should be used to determine the type and scale of mitigation measures required.
- B.16 If the risk is classed as negligible, no mitigation measures beyond those required by legislation will be necessary.

Step 4

- B.17 Step 4 assesses the residual effect, with mitigation measures in place, to determine whether or not these are significant.

Professional Judgement

- B.18 The IAQM guidance makes reference to the use of professional judgement when assessing the risks of dust and fine particulate matter from demolition and construction sites. Details of the experience of the personnel involved with the project are provided in **Appendix D**.

¹¹ Greater London Authority, The Control of Dust and Emissions from Construction and Demolition: Best Practice Guidance, 2006

Appendix C: Professional Experience of Assessors

- C.1 The assessment of air quality impacts, and the significance of the associated effects, takes into account the professional judgement of the assessor. Details of the experience of the personnel involved with the project are provided below:

Philip Walton

BSc (Hons), AIAQM, AMIEnvSc

Philip has over four years' experience in the air quality field in both regulatory and consultancy roles, having prepared numerous technical reports and conducted monitoring exercises.

Philip has prepared air quality assessments and environmental statement chapters for sites across the UK for a range of schemes including residential uses in urban and city localities (including developments exceeding 1,000 dwellings), commercial and industrial uses, link roads and quarries. Philip has also project managed air quality monitoring studies. Philip's dust experience includes; preparation of dust management plans for quarries and construction schemes, dust monitoring, dust audits and preparation of the IAQM construction reports. Philip has also prepared numerous reports for odour.

Malcolm Walton

BSc (Env Health) Dip (Acoustics & Noise Control)

MCIEH AMIOA

Malcolm holds a Bachelor of Science degree in Environmental Health and the Diploma in Acoustics and Noise Control. Malcolm is a Member of the Chartered Institute of Environmental Health and an Associate Member of the Institute of Acoustics. Malcolm joined Wardell Armstrong in September 2001 following 12 years working as an Environmental Health Officer in several local authorities, responsible for the enforcement of environmental legislation and in particular air pollution and noise nuisance. Malcolm has experience in the technical co-ordination of environmental appraisal of large schemes to UK and international standards. Malcolm regularly carries out and co-ordinates noise and air quality assessment work associated with planning applications including EIA work and PPC permit application/compliance. He regularly acts as expert witness in planning inquiries in respect of noise, air quality and odour.

**Senior Environmental
Scientist (Air Quality)**

Technical Director