Air Quality Constraints Assessment:
Land East of A465, Abergavenny

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Experts in air quality management & assessment

Document Control

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1 Introduction

1.1 This report provides a high-level review of baseline air quality information available for the area surrounding a site proposed for mixed-use development, on land east of the A465 in Abergavenny and a qualitative assessment of the potential effects. The assessment has been carried out by Air Quality Consultants Ltd on behalf of Monmouthshire Housing Association.

1.2 This assessment has been carried out to identify any potential air quality constraints to the development of the site for the proposed uses and the potential for significant air quality effects in the surrounding area. It considers the following:

- existing baseline air quality conditions, including:
  - identification of nearby major sources of air pollution;
  - a review of Monmouthshire County Council's most recently available Air Quality Progress Report;
  - identification of nearby Air Quality Management Areas (AQMAs);
  - identification of nearby relevant air quality monitoring; and
  - identification of background concentrations.
- identification of the potential air quality constraints associated with the proposed development of the land for all potential uses, taking account of the baseline conditions;
- identification of the potential significant effects brought about as a result of the proposed development, taking account of baseline conditions; and
- a summary overview.

2 Baseline Air Quality

Site Description

2.1 The site is situated off the A465 in Abergavenny, and is bordered by the road itself, undeveloped and agricultural land. It currently comprises agricultural and undeveloped land.

Industrial sources

2.2 A search of the UK Pollutant Release and Transfer Register[1] has not identified any significant industrial or waste management sources that are likely to affect the proposed development in terms of air quality.

Air Quality Review and Assessment

2.3 Monmouthshire County Council has investigated air quality within its area as part of its responsibilities under the Local Air Quality Management (LAQM) regime. The Council has declared two AQMAs in its area, both of which are over 14 km from the proposed development and do not present constraints.

Local Air Quality Monitoring

2.4 Monmouthshire County Council operates a number of nitrogen dioxide monitoring sites using diffusion tubes prepared and analysed by Gradko International Limited (using the 20% TEA in water method), including eight within Abergavenny. Available data for the years 2014 to 2019 have been taken from the Monmouthshire County Council 2020 Air Quality Progress Report[2], and are summarised in Table 1.

Table 1: Summary of Annual Mean NO_2 Monitoring (2014-2019) (µg/m^3)

Site No.	Site Type	Location	2014	2015	2016	2017	2018	2019
AB1	Kerbside	Lamp post Merthyr Rd. (A4143), Abergavenny	39.3	36.1	38.4	38.0	36.9	35.4
AB2	Roadside	Back Clinic, 2a Bridge Cottages, Llanfoist, Merthyr Road, Abergavenny, NP7 9LL	39.1	34.4	35.0	32.7	33.8	31.4
AB3	Roadside	112 Merthyr Road, Abergavenny, NP7 5DF	29.0	26.1	26.8	25.4	28.5	27.5

[1] Defra (2021) *UK Pollutant Release and Transfer Register*, Available: http://prtr.defra.gov.uk/map-search.

[2] Monmouthshire County Council (2020), *Monmouthshire County Council 2020 Air Quality Progress Report*, Available: https://www.monmouthshire.gov.uk/app/uploads/2021/01/MCC-AQ-APR-2020.pdf

Site No.	Site Type	Location	2014	2015	2016	2017	2018	2019
AB4	Roadside	L/P Adj. 5 Coopers Way, Merthyr Rd, Abergavenny	27.8	26.5	26.4	25.5	27.6	25.0
AB5	Roadside	1 Usk View, Merthyr Rd, Abergavenny	19.8	17.2	19.4	18.6	19.0	17.9
AB6	Roadside	L/P No. MB991 Adj. 9 & 11 Merthyr Rd, Abergavenny	23.8	22.4	22.4	22.3	21.8	22.0
AB7	Kerbside	L/P No. WB259 – 14 Pen-y-fal Road, Abergavenny, NP7 5UB	-	-	-	-	-	22.6
AB8	Roadside	4 Northgate, Abergavenny, NP7 5TT	-	-	-	-	-	20.1
Objective [a]			**40**					

[a] Information on the National Air Quality Objectives and where they apply is provided in the Appendix.

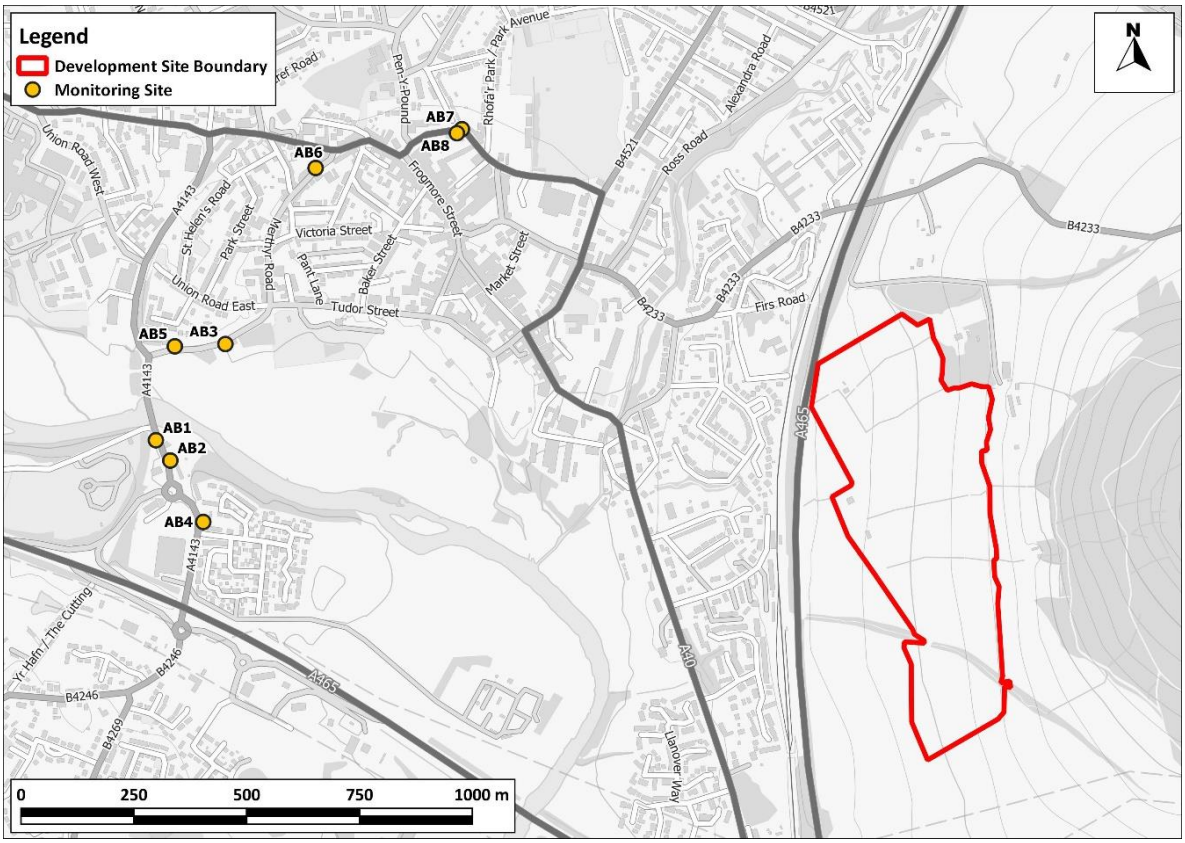

Figure 1: Monitoring Sites

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2.5 The Progress Report published by Monmouthshire County Council states that there have been no exceedances of the annual mean nitrogen dioxide objective since 2012. The data set out above

also indicates that since 2014 there has also been an overall downward trend in concentrations at all monitoring sites.

2.6 Monmouthshire County Council also monitor PM_{10} and $PM_{2.5}$ concentrations, at the automatic monitoring station within Chepstow AQMA, approximately 30 km to the southeast of the proposed development. Measured concentrations at this roadside monitoring site (located 3 m from the kerb) have been well below the relevant objectives in all recent years.

Exceedances of EU Limit Values

2.7 The Welsh Government has not identified any locations in the area where the limit value is anticipated to be exceeded beyond 2019.

Background Concentrations

2.8 Estimated background concentrations for 2019 at the proposed development, derived from Defra's background maps[3] are set out in Table 2. The background concentrations, which represent the air quality conditions away from specific sources of pollution, are all well below the objectives. The anticipated year of opening is not known at this stage, so background concentrations have been presented for 2019 only, which provides a conservative assessment, as concentrations are expected to reduce in future years.

Table 2: Estimated Annual Mean Background Pollutant Concentrations in 2019 (µg/m^3)

Year	NO_2	PM_{10}	$PM_{2.5}$
2019	5.1 - 7.5	10.9 – 11.7	7.1 – 7.9
Objectives	**40**	**40**	**25** [a]

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

[3] Defra (2021), *Local Air Quality Management Support Website,* Available: http://laqm.defra.gov.uk/.

3 Local Planning Policy

3.1 The Monmouthshire Local Development Plan[4] was adopted in February 2014 and includes policy EP1 in relation to air quality:

"…Development proposals that would cause or result in an unacceptable risk/harm to local amenity, health, the character/quality of the countryside or interests of nature conservation, landscape or built heritage importance due to the following will not be permitted, unless it can be demonstrated that measures can be taken to overcome any significant risk: Air pollution….Or any identified risk to public health or safety."

3.2 The Local Development Plan is currently under review. As part of this process the Monmouthshire Replacement Local Development Plan (RLDP) Preferred Strategy[5] was published in June 2021. This includes Strategic Policy S4, which states:

"All development proposals will be required to make a positive contribution towards addressing the causes of, and adapting to the impacts of, climate change. Means of achieving this will include:

i) Having low/zero carbon energy requirements by reducing energy demand and promoting energy efficiency;

ii) Supporting the development of renewable and low/zero carbon energy generation and a presumption against energy generation utilising fossil fuels, fracking and methods that are not low/zero carbon;

iii) Utilising sustainable construction techniques and local supplies through the adoption of the circular economy principles;

iv) Incorporating water efficiency measures and minimising adverse impacts on water resources and quality;

v) Promoting the efficient use of land and co-location of uses to minimise the overall need to travel and maximise opportunities for active travel and public transport use;

vi) Promoting the provision of ultra-low emission vehicle charging infrastructure to reduce emissions and improve air quality;

[4] Monmouthshire County Council (2014), *Monmouthshire County Council Adopted Local Development Plan*, Available: https://www.monmouthshire.gov.uk/app/uploads/2017/05/Adopted-Local-Development-Plan-with-PDF-tags.pdf

[5] Monmouthshire County Council (2014), *Monmouthshire Replacement Local Development Plan (RLDP) Preferred Strategy*, Available: https://www.monmouthshire.gov.uk/app/uploads/2021/07/Preferred-Strategy-June-2021.pdf

vii) Support resilience of development through Green Infrastructure solutions including: opportunities for biodiversity and resilient ecosystems, greenspace provision and connectivity, sustainable energy use, local food production and flood attenuation and water resource management; and

viii) Avoid locating development in areas at risk of flooding, or where appropriate, minimise the risk of flooding including the incorporation of measures such as Sustainable Urban Drainage Systems and flood resilient design."

4 Air Quality Constraints

Impacts on Future Residents of the Proposed Development

4.1 A search of the UK Pollutant Release and Transfer Register[6] has not identified any significant industrial or waste management sources that are likely to affect the proposed development, in terms of air quality. Examining the 2020 Air Quality Progress Report revealed no relevant sources of pollution.

4.2 The proposed development site occupies a large area of land; a short section of the north-western site boundary lies adjacent to the A465. The remainder of the site is located away from the road. Defra's Technical Guidance[7] states that "*concentrations fall-off rapidly on moving away from the source*", and defines urban background monitoring locations as being 50 m from major sources of pollution; air quality conditions within the site will therefore be better in locations further from the A465.

4.3 Traffic data available from the Department for Transport (DfT)[8] indicate that traffic flows along the A465 are less than half of traffic flow volumes on the A40 adjacent to monitoring sites AB7 and AB8 and on the A4143 adjacent to monitoring sites AB1 and AB2. It is therefore expected that concentrations would be lower at the site boundary adjacent to the A465 than at monitoring sites AB1, AB2, AB7 and AB8 (Table 1).

4.4 Traffic flows on the A48 adjacent to the automatic monitoring station within the Chepstow AQMA, where PM_{10} and $PM_{2.5}$ concentrations are measured, are significantly higher than those on the A465 adjacent to the proposed development site. It is therefore expected that concentrations would be lower at the site boundary adjacent to the A465 than measured at the Chepstow automatic monitoring station.

4.5 At locations within the site, further away from the A465, concentrations will be close to background concentrations in Table 2.

4.6 Consequently, air quality throughout the proposed development site is likely to be good, with measured concentrations well below the relevant air quality objectives.

[6] Defra (2020b), *UK Pollutant Release and Transfer Register*, Available: http://prtr.defra.gov.uk/map-search

[7] Defra (2021), *Local Air Quality Management Technical Guidance (TG16)* April 2021 version, Available: https://laqm.defra.gov.uk/technical-guidance/

[8] DfT (2021), *Road Traffic Statistics*, Available: https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints

Impacts of the Proposed Development

4.7 The construction of the proposed development may impact on air quality at existing properties. There are existing residential properties to the west of the development, on the opposite side of the A465, as well as a number of properties on land north of the development site. In the context of a construction dust assessment, these are considered sensitive human health receptors. However, it can be assumed that best practice mitigation measures would be implemented through a Construction Environmental Management Plan during construction. With appropriate measures in place, air quality effects on existing properties during construction will not be significant.

4.8 The proposed development will generate additional traffic on the local road network, which could impact upon air quality at existing residential properties. The main air pollutants of concern related to traffic emissions are nitrogen dioxide (NO_2) and fine particulate matter (PM_{10} and $PM_{2.5}$). 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 guidance provided by Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM)[9]. The criteria state that for locations outside of an AQMA, the impact of additional traffic emissions can be judged to be insignificant where:

- the development will lead to a change in light duty vehicle (LDV) flows of less than 500 AADT (Annual Average Daily Traffic);
- the development will lead to a change in heavy duty vehicle (HDV) flows of less than 100 AADT.

4.9 The project transport consultants (Lime Transport) have estimated that the development will generate approximately 3,600 AADT once fully operational, of which 36% (~1,300) are predicted to travel north of the site, and 64% (~2,300) are predicted to travel south. Taking account of the good existing air quality conditions, that air quality is expected to continue to improve in future years, that the proposed development will become operational over a number of years, and the distribution of traffic onto the wider road network, it is judged that the proposed development is unlikely to result in any significant impacts in the local area. However, a detailed assessment of the impacts will be required in order to confirm this. Consideration will be given at the planning application stage to the impact of additional traffic generated by the proposed development on existing air quality.

4.10 The River Usk / Afon Wysg Special Area of Conservation (SAC) and Site of Specific Scientific Interest (SSSI) is located adjacent to the A465, approximately 600 m west of the proposed development, which may be affected by additional traffic generated by the proposed development.

[9] Moorcroft and Barrowcliffe et al (2017) *Land-Use Planning & Development Control: Planning For Air Quality v1.2*, IAQM, London, Available: http://iaqm.co.uk/guidance/

There are also several Ancient Woodland sites near the proposed development and adjacent to local roads.

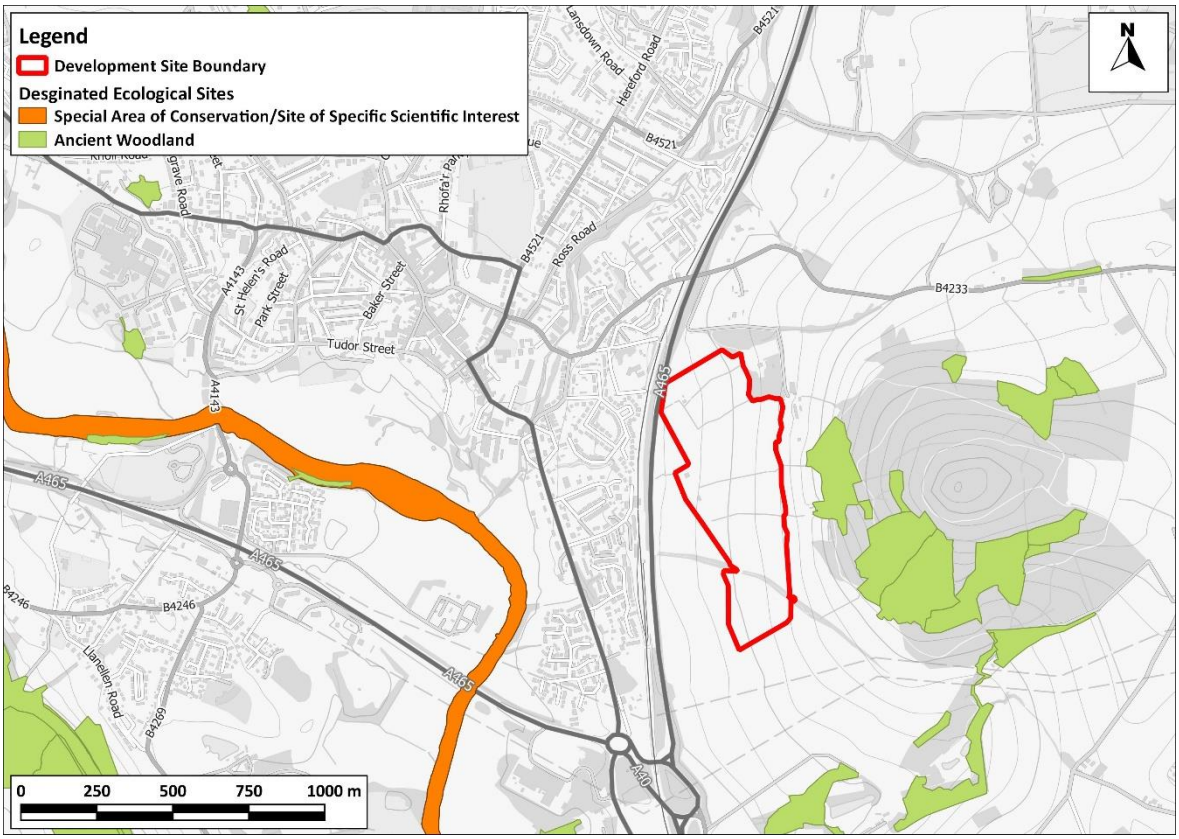

Figure 2: Ecological Sites

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4.11 Natural Resources Wales apply guidance issued by Natural England when considering potential impacts from road traffic emissions. This guidance states that changes in traffic flows of less than 1,000 AADT are unlikely to result in significant effects within ecological sites. Depending on the distribution of the proposed development generated traffic, an assessment may be required to determine the impacts of the development on the identified ecological sites.

5 Summary Overview

5.1 The air quality constraints for the proposed development at Land East of A465, Abergavenny have been considered.

5.2 Based on local monitoring data, air quality at the proposed development site is likely to be good; concentrations of nitrogen dioxide, PM_{10} and $PM_{2.5}$ are below the relevant objectives adjacent to roads which experience higher traffic volumes than the A465 adjacent to the proposed development. Air quality for future residents will therefore be acceptable.

5.3 During construction, the proposed development will generate dust. With appropriate mitigation in place, construction dust impacts will not be significant. A construction dust risk assessment may be required at the planning application stage to determine the appropriate level of mitigation to be applied.

5.4 The proposed development will generate additional traffic on the local road network, however, taking account of the existing good air quality in the vicinity of the site, and the volume of additional traffic generated, the impacts at nearby existing residential and ecological sites are unlikely to have a significant effect. A detailed air quality assessment is likely to be required at the planning application stage in order to assess these impacts, and to determine the need for mitigation.

5.5 Based on the above, and taking account of relevant local policies relating to air quality, there is judged to be no reason from an air quality perspective why the site should not be allocated for residential development.

6 Appendix – National Air Quality Objectives

6.1 The 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 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[10] and the Air Quality (Amendment) (Wales) Regulations[11].

6.2 The objectives for nitrogen dioxide and PM_{10} 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.

6.3 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[12]. The annual mean objectives for nitrogen dioxide and PM_{10} 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 PM_{10} 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.

6.4 The European Union has also set limit values for nitrogen dioxide, PM_{10} and $PM_{2.5}$[13]. 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 recognise local authority monitoring or local modelling studies when determining the likelihood of the limit values being exceeded.

[10] The Air Quality (Wales) Regulations 2000 Statutory Instrument 1940 (W. 138) *(2000)*, HMSO, Available: http://www.legislation.gov.uk/wsi/2000/1940/contents/made

[11] The Air Quality (Amendment) (Wales) Regulations 2002 Statutory Instrument 3182 (W. 298) *(2002),* HMSO, Available: http://www.legislation.gov.uk/wsi/2002/3182/contents/made

[12] Defra (2021) Review & Assessment: Technical Guidance LAQM.TG16 April 2021 version, Defra, Available: https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf.

[13] The European Parliament and the Council of the European Union (2008) Directive 2008/50/EC of the European Parliament and of the Council, Available: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0050

6.5 The relevant air quality criteria for this assessment are provided in Table 3.

Table 3: Air Quality Criteria for Nitrogen Dioxide, PM_{10} and $PM_{2.5}$

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
Fine Particles (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
Fine Particles ($PM_{2.5}$) [a]	Annual Mean	25 µg/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.