

# Redevelopment of Porthcawl Waterfront

## CHAPTER 7 – Air Quality

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## 7.1. Introduction

### Background

- 7.1.1. The following Chapter has been prepared by Stantec.
- 7.1.2. This Chapter of the Environmental Statement (ES) assesses the likely significant effects of the Proposed Development, as described in Volume 1, Chapter 4 of this ES, in terms of Air Quality.
- 7.1.3. This Chapter should be read in conjunction with the following Technical Appendices:
- Volume 3, Appendix 7.1: Air Quality Appendices.
- 7.1.4. This Chapter is also supported by the following Figures:
- Figure 7.1: Modelled Roads (DM) Full Model Extent
  - Figure 7.2: Modelled Roads (DM) Porthcawl Zoomed Extent
  - Figure 7.3: Modelled Roads (DS) Porthcawl Zoomed Extent
  - Figure 7.4: Modelled Human Receptors Full Model Extent
  - Figure 7.5: Modelled Human Receptors Porthcawl Zoomed Extent
  - Figure 7.6: BCBC Air Quality Monitoring.

### Site Location and Description

- 7.1.5. The Site is located at Porthcawl, on the south coast of Wales, between Cardiff and Swansea. The Site is the Porthcawl Waterfront development area. It is a large site of 43.82 ha and is mostly brownfield. The Site is within 5 miles of M4 Junction 37 and is connected to it by the A4229. Its area spans between the historic Harbour in the south, The Portway road to the west, and ultimately 'Trecco Bay' holiday park in the east; also bounded by residential and mixed-use areas to the north. It is located approximately 380 metres east of Porthcawl town centre, and the Site lies immediately north of Porthcawl's Sandy Bay beach and Rhych Point peninsula.

### Proposed Development

- 7.1.6. The "Proposed Development" comprises:
- Up to 980 homes
  - Approximately 20 ha of open space including a series of new significant public open spaces with different offers

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- 2.2 ha of land for educational use
- Approximately 130,000 square feet of commercial and leisure floorspace including retail uses, a Hotel, Lido and Gym / Studio Space.
- Enhancement of Porthcawl Harbour environment
- New coastal defence works
- A flexible meanwhile leisure use space (approximately 23,500 square feet)
- Approximately 6,500 square feet of flexible community / civic space
- Provision of up to 600 public parking spaces within the site area
- New spine road access from the Eastern Promenade to Sandy Bay
- Enhancement of the Griffin Park and proposed new facilities including MUGA

7.1.7. Outline Planning Permission is sought for all elements except the proposed Spine Road for which Full Planning Permission is sought.

**Legislation and Policy Framework****Air Quality Regulations and Objectives**

7.1.8. There are two sets of air quality legislation which include ambient air quality thresholds for the protection of public health that apply in Wales, these include legally binding limit values originally set by the European Union (EU) Directive 2008/50/EC on ambient air quality and cleaner air for Europe; and regulations implementing national air quality objectives as set out in the Air Quality Strategy (AQS) for Scotland, Wales and Northern Ireland (AQS) (DEFRA, 2007) which local authorities are required to work towards achieving.

7.1.9. The EU (Withdrawal Agreement) Act 2020 sets out arrangement for implementing air quality limit values that are included in the EU Directive on ambient air quality and cleaner air for Europe (2008/50/EC) included in the following:

- Air Quality Regulations (SI 2010 No.1001) and amended (SI 2016 No.1184);
- The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 (SI 2019 74);
- The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (SI 2020 1313) amend the Air Quality Regulations (SI 2010 No.1001) to account for EU withdrawal; and

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- The AQS objectives are implemented in the Air Quality Standards (Wales) Regulations 2010.

7.1.10. The AQS 2007 Volume 1 sets out the government's policies and framework for improving air quality in the UK with the aim of meeting the requirements of above legislation. The AQS also outlines the Limit Values, Target Values, Standards, Objectives, Critical Levels and Exposure Reduction Targets for the protection of human health and the environment (collectively termed Air Quality Assessment Levels (AQALs) throughout this Chapter). Those relevant to this assessment is provided below, in

7.1.11. Table 7.1.

*Table 7.1: AQALs*

Pollutant	Averaging Period	AQALs
NO <sub>2</sub>	1 Hour Mean	200 µg/m <sup>3</sup>
	Annual Mean	40 µg/m <sup>3</sup>
PM <sub>10</sub>	24 Hour Mean	50 µg/m <sup>3</sup>
	Annual Mean	40 µg/m <sup>3</sup>
PM <sub>2.5</sub>	Annual Mean	25 µg/m <sup>3</sup>

7.1.12. DEFRA's Local Air Quality Management Technical Guidance 2022 (LAQM.TG(22)) (DEFRA, 2022) provides guidance on where the above AQAL's should apply. This is summarised below, in Table 7.2.

*Table 7.2: Summary of where AQALs should apply*

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 facades 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 other 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 objective would apply, together with hotels. Gardens of residential properties	Kerbside sites (as opposed to other locations at the building façade) or any other location where public exposure is expected to be short term.

Averaging Period	Objectives should apply at:	Objectives should generally NOT apply at:
1 Hour Mean	<p>All locations where the annual Mean and: 24 and 8-hour mean objectives apply. Kerbside site (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railways stations etc. which are not fully enclosed, where members of the public might be expected to spend one hour or more.</p> <p>Any outdoor locations where members of the public might reasonably expect to spend one hour or longer.</p>	Kerbside sites where the public would not be expected to have regular access.
15 Minute Mean	All locations where member of the public might reasonably be exposed for a period of 15 minutes	

#### Air Quality Objectives for Ecological Sites

7.1.13. The main pollutants of interest are the toxifying effects of nitrogen oxides (NO<sub>x</sub>), and changes in botanical species composition and structure due to acid deposition and eutrophication by nitrogen deposition. In addition, greater ammonia (NH<sub>3</sub>) concentrations in the atmosphere will lead to increased rates of nitrogen deposition.

7.1.14. The assessment of impacts from air pollution on designated nature conservation sites is generally undertaken in the context of both 'Critical Levels' and 'Critical Loads' defined below:

- Critical Levels – Critical Levels are defined as the concentration of an air pollutant in ambient air above which adverse effects on sensitive ecosystems may occur.
- Critical Loads – Critical Loads are defined as the deposition flux of an air pollutant below which significant harmful effects on sensitive ecosystems do not occur.

7.1.15. The AQALs of relevance to ecological screening assessments are summarised below in Table 7.3. At concentrations above these AQALs, both beneficial and adverse responses have been recorded. The long-term Critical Level for NO<sub>x</sub> was set on the basis that growth effects are likely to affect vegetation diversity and survival and occur at lower annual average concentrations than other effects.

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Table 7.3: Ecological AQLAs

Pollutant	Averaging Period		
NO <sub>x</sub>	Annual Mean	30 µg/m <sup>3</sup>	Applies to all vegetation
	Daily Mean	200 µg/m <sup>3</sup> (or 75 µg/m <sup>3</sup> ) *	Applies to all vegetation.
NH <sub>3</sub>	Annual Mean	3 µg/m <sup>3</sup>	
	Daily Mean	1 µg/m <sup>3</sup>	If important lichens / bryophytes are present
*The critical level is generally considered to be 75 µg/m <sup>3</sup> ; but this only applies where there are high concentrations of SO <sub>2</sub> and ozone, which is not generally the current situation in the UK.			

7.1.16. In addition to ambient Critical Levels, there are habitat specific Critical Loads for nitrogen deposition (leading to eutrophication) and acid deposition (leading to acidification). Critical Loads for nitrogen deposition are given as a range and quoted in units of kilograms of nitrogen per hectare per year (kg N/ha/year). Critical Loads for acidification are described in units of kilograms of H<sup>+</sup> ion equivalents per hectare per year (keq/ha/year). The habitat specific Critical Loads for nitrogen deposition and acid deposition of relevance to this assessment are provided in Volume 3, Appendix 7.1: Air Quality Appendices.

#### Clean Air Plan for Wales

7.1.17. The Clean Air Plan for Wales (Welsh Government, 2020) sets out Wales's commitment and long-term ambition to improve air quality and reduce the impacts of air pollution on human health, biodiversity, the natural environment and the economy. The 10-year pathway has been structured around four core themes; people, environment, prosperity and place. Furthermore, amongst numerous air quality actions, the document outlines the implementation of a Clean Air Act and how it will be developed and what it is likely to include.

7.1.18. The Environment (Air Quality and Soundscapes) (Wales) Act 2024 became law in Wales 14 February 2024 (Welsh Government, 2024). The Clean Air Act (Wales) requires the Welsh Government to:

- *provide a framework for setting national air quality targets and consider WHO guidelines,*
- *amend existing legislation relating to the national air quality strategy;*

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- *local air quality management; smoke control; clean air zones/low emission zones and vehicle idling; and*
- *place a duty on Welsh Ministers to promote awareness of air pollution.*

**Local Air Quality Management**

7.1.19. Obligations under the Environment Act 2021 (Environment Act 2021 c. 30) (which provides an amendment to the Environment Act 1995 (Environment Act 1995 c.2 5)) requires local authorities to review and assess air quality in their administrative boundaries. Where AQALs are predicted to be exceeded, the local authority must declare an Air Quality Management Area (AQMA) at sensitive receptor locations and formulate an Air Quality Action Plan (AQAP) to reduce pollution concentrations to values below AQALs.

7.1.20. The Welsh Government published the Local Air Quality Management in Wales Policy Guidance (Welsh Government, 2017) in 2017 in order to integrate the Well-being of Future Generations (Wales) Act 2015 (Welsh Government, 2015) into the Local Air Quality Management (LAQM) system in Wales. This directed local authorities to integrate the five ways of working from this Act into LAQM, including the principles of long-term, prevention-focused, integration, collaboration and involvement.

**Tackling Roadside Nitrogen Dioxide Concentrations in Wales**

7.1.21. The Welsh Supplemental Plan to the 'UK plan for tackling roadside nitrogen dioxide concentrations 2017' (Welsh Government, 2018) sets out work that has been, and continues to be done to identify how Wales will reduce concentrations of NO<sub>2</sub> around roads where levels are above legal limits in the "shortest time possible".

**Well-being of Future Generations Act**

7.1.22. The Well-being of Future Generations Act (Welsh Government, 2015) requires public bodies in Wales to consider the long-term impact of their decisions, to collaborate with people, communities and each other, and to prevent persistent problems such as poverty, health inequalities and climate change. Under the Well-being of Future Generations Act, the Welsh government has established average population exposure to NO<sub>2</sub> as an indicator to measure progress towards well-being goals in Wales. Regulations made under the Act require public services boards to consider air quality when carrying out their statutory assessments of local well-being.



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**National Planning Policy**

## Planning Policy Wales

7.1.23. Planning Policy Wales (PPW) (Welsh Government, 2024) sets out the national policy and guidance for making planning decisions in Wales. Section 6.7 relates to air quality, stating that *"the planning system should maximise its contribution to achieving the well-being goals, and in particular a healthier Wales, by aiming to reduce average population exposure to air and noise pollution alongside action to tackle high pollution hotspots"*.

7.1.24. For new development, planning authorities and developers must address any implication arising as a result of its association with, or location within, air quality management areas or areas where there are sensitive receptors, not create areas of poor air quality, and seek to incorporate measures which reduce overall exposure to air pollution. It also states the need for consideration of airborne pollution during the construction phase of development.

## Technical Advice Note 18: Transport

7.1.25. TAN 18 was adopted in March 2007 (Welsh Government, 2007) and should be read in conjunction with PPW. There are no policies within the TAN 18 that relate directly to air quality. However, TAN states that *"transport emissions contribute significantly to climate change and poor air quality"* and when *"considering planning applications, planning authorities should take into account statutory air quality objectives, together with the results of air quality reviews and assessments and any Air Quality Management Area Action Plans that may have been prepared."*

## Future Wales: the National Plan 2040

7.1.26. Future Wales: the National Plan 2040 (Welsh Government, 2021) forms part of the national development framework for Wales and promotes development that enhances wellbeing and quality of life. The document should be read in conjunction with Planning Policy Wales and planning applications will need comply with the plan. Air quality and clean air is referenced throughout the document, in particular developing infrastructure responsibly.

**Local Planning Policy**

7.1.27. On 13 March 2024, Bridgend County Borough Council (BCBC) adopted the Replacement Local Development Plan (RLDP) 2018-2033 (BCBC, 2024a) for Bridgend County Borough. It sets out key policies and land use allocations that will shape the future of Bridgend County Borough and guide development up to 2033. Within this, the following policy, DNP9: Natural Resource Protection and Public Health, is relevant to air quality:

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*"Development proposals will only be permitted where it can be demonstrated that they would not cause a new, or exacerbate an existing, unacceptable risk of harm to health, biodiversity and/or local amenity due to:*

*1) Air pollution;*

*[...]*

*Development in areas currently subject to the above will need to demonstrate mitigation measures to reduce the risk of harm to public health, biodiversity and/or local amenity to an acceptable level. The use of construction phase Pollution Prevention Plans are encouraged, where appropriate, to demonstrate how proposals can prevent development water run-off from causing pollution of the water environment. All proposals within HSE consultation zones must also demonstrate the acceptability and need for development. All development in flood risk areas must be supported by a Flood Consequences/Risk Assessment and incorporate any mitigation measures required to avoid or manage increased flood risk."*

7.1.28. Policy SP2: Regeneration Growth Area and Sustainable Growth Area Strategic Allocations, and PLA1: Porthcawl Waterfront, Porthcawl Regeneration Growth Area have also been reviewed but do not make specific mention of air quality or air pollution.

#### Guidance and Best Practice

7.1.29. This ES Chapter has been prepared with the following best practice and guidance documents:

- Defra's LAQM.TG (22) (DEFRA, 2022);
- EPUK & IAQM Land-use Planning & Development Control: Planning for Air Quality (EPUK & IAQM, 2017);
- The IAQM's guidance on assessing impacts from construction (IAQM, 2024); and
- The IAQM's A guide to the assessment of air quality impacts on designated nature conservation sites guidance (IAQM, 2019).

## 7.2. Assessment Methodology

### Consultation

- 7.2.1. Consultation was undertaken directly with the Shared Regulatory Services (SRS) Environmental Technical Officer, acting on behalf of BCBC, to agree the proposed methodology to the air quality assessment and ES Chapter.
- 7.2.2. An email outlining the proposed methodology was sent on the 11<sup>th</sup> of September 2025. A positive response was received on the 15<sup>th</sup> of September 2025 agreeing in principle to the outlined methodology.
- 7.2.3. Further consultation was also undertaken regarding the Park Street, Bridgend AQMA. This is addressed in Paragraph 7.2.17 via additional information provided by the Transport Consultants.
- 7.2.4. The full consultation can be found at Volume 3, Appendix 7.1: Air Quality Appendices.
- 7.2.5. BCBC's EIA Scoping Opinion response (ref. P/25/462/ESO) has been reviewed. With regards to air quality the Scoping Opinion response states:

*"In relation to Air Quality; an Assessment of construction and operational impacts will be required due the size of the development and traffic generation likely above the threshold for dispersion modelling (EPUK and IAQM guidance "Land- Use Planning and Development Control: Planning for Air Quality).*

*Due to the nature of the development, in terms of its purpose and its location, via the submission of an appropriate air quality assessment (AQA) the applicant must give consideration to the potential impacts on ambient air quality and the magnitude/ risk of these potential air quality impacts on nearby local sensitive receptors and future occupants of the development. An AQA will be required as part of the Environmental Impact Assessment (EIA).*

*Consideration of air quality impacts should also be examined through the development stage and when the development is complete, focusing on dust emissions during the construction phase of the development and potential exposure of existing nearby*

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*sensitive receptors/ future occupants to traffic derived Nitrogen Dioxide (NO<sub>2</sub>) & Particulate Matter (PM<sub>10</sub> & PM<sub>2.5</sub>) following completion of the development."*

7.2.6. With regards to cumulative assessment the Scoping Opinion response states:

**"Cumulative Effects**

*The [Scoping Statement] SA proposes to scope out cumulative effects from the Environmental Statement, as the screening opinion identified no existing development, and / or approved development that was deemed likely to have cumulative effect alongside the proposed development as such agree with that this can be scoped out."*

**Scope**

7.2.7. The potential air quality effects of the construction and operational phase traffic resulting from the Proposed Development have been scoped into this ES Chapter and will be assessed as described below in this methodology section.

7.2.8. The following areas are scoped out of this ES Chapter; in each case a brief justification is given.

7.2.9. The construction phase has the potential to generate dust and Particulate Matter (PM<sub>10</sub>) during the construction phase which can lead to the potential for nuisance and health effects at nearby sensitive receptors. However, the IAQM guidance (IAQM, 2024), states that:

*"in the case of demolition/construction it is assumed that mitigation (secured by planning conditions, legal requirements or required by regulations) will ensure that a potential significant adverse effect will not occur, so the residual effect will normally be 'not significant'".*

7.2.10. As the residual effect of the construction phase dust and PM<sub>10</sub> impacts are considered to be **Not Significant**, these are scoped out of this ES chapter. Whilst not within the scope of the EIA, a construction dust risk assessment has been undertaken in line with IAQM guidance (IAQM, 2024) in Volume 3, Appendix 7.1: Air Quality Appendices, so that suitable mitigation measures can be determined for inclusion in the Construction Environmental Management Plan (CEMP). The CEMP, and the dust mitigation measures recommended

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therein, are considered embedded tertiary mitigation as are considered best practice for the control of potential construction phase dust impacts.

7.2.11. The main energy strategy throughout the Proposed Development would avoid combustion, consisting of Air Source Heat Pumps (ASHPs) or similar. Therefore, the main energy strategy does not require further assessment within this ES Chapter as it would not result in any air pollutant emissions and the effects are considered to be **Not Significant**.

7.2.12. With regards to potential operational phase traffic effects on the short-term NO<sub>x</sub> critical level, the IAQM nature sites guidance (IAQM, 2019) states that:

*"This IAQM guidance, therefore, recommends that only the annual mean NO<sub>x</sub> concentration is used in assessments unless specifically required by a regulator; for instance, as part of an industrial permit application where high, short-term peaks in emissions, and consequent ambient concentrations, may occur".*

7.2.13. Therefore, the short-term NO<sub>x</sub> critical level is not considered further in this assessment.

7.2.14. The Proposed Development has the potential to bring forwards new food and beverage use (such as cafes and restaurants). This use has the potential for odour emissions which may result in impacts at any sensitive receptors in close proximity to source. However, any potential odour impacts, which would only be confirmed once details of potential food and beverage uses come forward, could be suitably controlled and mitigated through abatement techniques. It is assumed that for any such uses a planning condition would require a Kitchen Odour Risk Assessment (KORA), which would assess the risk of odour from any odorous food and beverage use and recommend mitigation measures to reduce odour risks. It is considered this process would be sufficient to reduce any potential odour impacts and effect to be **Not Significant**. No other sources of odour have been identified, either proposed or existing in the Site Locale, and therefore consideration of odour has been scoped out of the ES Chapter.

7.2.15. Finally, the exposure to future receptors at the Site to potential poor air quality is not considered to fall within the requirements of this Chapter and has been assessed within Volume 3, Appendix 7.1: Air Quality Appendices.

### Study Area

7.2.16. For human receptors, the study area is the area is defined as receptors in proximity to all roads which could potentially exceed the screening criteria outlined in EPUK & IAQM

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guidance (IAQM, 2017), and were included in the study area provided by the Transport Consultants, Link Transport Planning.

7.2.17. The study area in this ES Chapter does not include the Park Street, Bridgend AQMA. With regards to the Proposed Development generated trips heading towards the AQMA, the project transport consultants, Link Transport Planning, have stated:

*"the current forecasts [which are assessed in the ES Chapter] are based on highly robust assumptions that were required for the Transport Assessment. They are therefore one of several potential future traffic scenarios, but the expectation is that current national transport policy aspirations for modal shift, as well as the sustainable strategy for the development site, will significantly reduce the development impact far below the worst-case scenario you have assessed."*

7.2.18. For ecological receptors, the study area includes designated ecological sites within 200 m of the kerbs of roads that could exceed the guidance threshold of traffic generation of 1,000 Annual Average Daily Traffic (AADT).

### Baseline Data Collection

7.2.19. A desk-based review of baseline conditions has been completed. Information regarding baseline air quality has been obtained by collating the information from the following sources:

- Recent monitoring data from BCBC's latest Air Quality Annual Progress Report (APR) 2024 (BCBC, 2024b);
- National air quality modelling of roadside NO<sub>2</sub> concentrations undertaken with Defra's Pollution Climate Mapping (PCM) model (DEFRA, 2020);
- National pollution maps published by DEFRA which cover the whole country on a 1x1 km grid (DEFRA, 2024); and
- Ecological baseline data from The UK Air Pollution Information System (CEH, 2024).

### Assessment of Potential Significant Effects

#### Construction Phase Traffic Impacts

7.2.20. The potential for a significant overall effect on existing sensitive receptors within the study area as a result of emissions from construction traffic generated by the Proposed

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Development has been determined qualitatively, taking into consideration the screening criteria outlined in the EPUK & IAQM guidance (EPUK & IAQM, 2017) (see Volume 3, Appendix 7.1: Air Quality Appendices), the anticipated routing of the generated traffic, and the anticipated duration of impacts associated with the generated traffic.

**Operational Phase Traffic Impacts**

7.2.21. Changes in emissions from traffic generated by the Proposed Development during the operational phase have been assessed using an air dispersion model; the latest version of ADMS-Urban (version 5.1.0.2), which was released in August 2025 by Cambridge Environmental Research Consultants (CERC). The model has been approved by DEFRA for use as an assessment tool for calculating the dispersion of pollutants from traffic on UK roads.

7.2.22. The ADMS-Urban modelling has been used to assess the road contribution of total pollutant concentrations at sensitive human and ecological receptors. Therefore, background concentrations (obtained from the DEFRA 2021-based background maps and APIS) have been added during post-processing to derive total ambient concentrations at modelled receptors.

7.2.23. This ES Chapter has assessed the future year scenarios for the Proposed Development whereby the completion year of 2033 (at the end of the BCBC Local Development Plan period) is assessed. This is considered a conservative assumption in the assessment. The following scenarios have been modelled:

- Baseline/verification 2023 – 2025 traffic survey data backdated to 2023;
- 2033 Do Minimum (2033 DM) – 2033 future baseline traffic flows; and,
- 2033 Do Something (2033 DS) – 2033 future baseline traffic flows + traffic flows of fully built out Proposed Development.

7.2.24. As agreed between the project transport consultant (Link Transport Planning) and BCBC, no traffic flows from Cumulative Schemes have been directly included in the DM or DS scenarios, as there are not any major committed developments in the study area that would warrant separate consideration. This position is also confirmed within the BCBC Scoping Opinion response.

7.2.25. Full details of the modelling parameters employed in this assessment are provided in Volume 3, Appendix 7.1: Air Quality Appendices. A brief summary is provided below.

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- 7.2.26. The traffic data used in the assessment, provided by the project transport consultants, Link Transport Planning, is shown in Volume 3, Appendix 7.1: Air Quality Appendices, with the modelled roads shown in ES Figure 7.1 to 7.3. Note, the full model extent for modelled roads is only shown for the DM scenario because the difference in modelled road geometry between the DM and DS scenarios is captured in the zoomed extents (Figure 7.2 and 7.3).
- 7.2.27. To predict pollutant emissions within the ADMS-Urban model from the traffic data, DEFRA's Emission Factor Toolkit (Version 13.1) (DEFRA, 2025) has been used for NO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub>. To predict NH<sub>3</sub> emissions, the Air Quality Consultants CREEAM tool (version 2) (AQC, 2025) has been used. DEFRA's 2021-based background maps have been used to obtain background concentrations of NO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> (DEFRA, 2024). Emission factors and background concentrations for future assessment year of 2033 have been used in the modelling.
- 7.2.28. Hourly sequential meteorological data for 2023 from Cardiff Airport Meteorological Station located approximately 25 km to the southeast of the Site (infilled with data from St. Athan) has been used.
- 7.2.29. A model verification study has been undertaken in accordance with DEFRA LAQM.TG(22) (DEFRA, 2022) to verify and adjust the air dispersion model results and the derived factor applied to NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations as detailed in Volume 3, Appendix 7.1: Air Quality Appendices.
- 7.2.30. For ecological receptors concentrations of NO<sub>x</sub> and NH<sub>3</sub> as well as nitrogen deposition and acid deposition Process Contributions (PCs) and Predicted Environmental Concentrations (PECs) were predicted.

### Significance Criteria

- 7.2.31. A description of the methodology used to determine receptor sensitivity, magnitude of impacts, and significance of effect for air quality is given below.

#### Receptor Sensitivity

- 7.2.32. Table 7.4 provides an overview of how the scale of sensitivity has been defined for the operational phase human receptors. This scale has been adapted to the air quality assessment for EIA purposes. Note that the sensitivities of Negligible and Very High have not been taken forwards in this ES Chapter.

*Table 7.4: Human Receptor Sensitivity for Operational Phase Assessment*

Sensitivity	Receptors
High	Locations where the Annual Mean AQALs apply, e.g.,



Sensitivity	Receptors
	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.
Medium	Locations where both annual mean and short term NAQOs apply (1-hour mean NO <sub>2</sub> , 24-hour mean PM <sub>10</sub> ), e.g., Hotels, Gardens of residential properties, Kerbside sites (for example, pavements of busy shopping streets), those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expect to spend one hour or longer.
Low	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer, e.g., Kerbside sites where the public would not be expected to have regular access.

7.2.33. With regards to ecological receptors, the receptors relative sensitivity is not specifically assigned by the air quality consultant.

#### Magnitude of Impacts

7.2.34. EPUK & IAQM guidance (EPUK & IAQM, 2017) provides an overview of how the operational phase impact magnitude (determined by the relative change in pollutant concentrations) should be assessed at human receptors. Relative increases are described as **Adverse** impacts, and relative decreases are described as **Beneficial** impacts.

7.2.35. The EPUK & IAQM guidance impact magnitude criteria are summarised below in Table 7.5. For consistency with the terminology used throughout this ES when discussing impact magnitude, the following changes have been made from the impacts descriptors given in the EPUK & IAQM guidance:

- Negligible = **Negligible**;
- Slight = **Low**;
- Moderate = **Medium**; and
- Substantial = **High**.

7.2.36. Note that the impact descriptor of No Change has not been taken forwards in this Chapter.

*Table 7.5: Matrix for the Magnitude of Impacts at Individual Human Receptors*

Long term average concentration at receptor in DS scenario	% Change in concentration relative to AQAL			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Low	Medium
76-94% of AQAL	Negligible	Low	Medium	Medium
95-102% of AQAL	Low	Medium	Medium	High
103-109% of AQAL	Medium	Medium	High	High
110% or more of AQAL	Medium	High	High	High

7.2.37. In terms of the impact of road traffic emissions on ecological receptors, an impact of less than 1% of the critical level or load is accepted to be a pragmatic threshold for determining a negligible impact, as is considered a reasonable quantum of long term pollution which is not likely to be discernible from fluctuations in background/measurements (IAQM, 2019). It should be noted that an impact of more than 1% is not, per se, an indication that a significant effect exists, only the possibility of one. Which would trigger the need for further, more detailed assessment of the ecological sensitivity and value of the habitat. Therefore, the following have been used for determining the potential impacts at ecological receptors:

- an impact of less than 1% of the critical level or load is **Negligible**; and
- an impact of more than 1% of the critical level or load indicates the possibility of a **non-negligible** impact.

7.2.38. Where the predicted impact exceeds 1%, input is required from the Project's ecological consultants to ascertain the potential significance of the impact and resultant effects.

7.2.39. Note that it is not within the remit of the air quality consultant to describe relative increases or decreases of NO<sub>x</sub>, NH<sub>3</sub>, Nitrogen and Acid Deposition as **Adverse** or **Beneficial**.

#### Duration and Pathway

7.2.40. For the operational phase, all the potential impacts and effects are considered to be **Permanent** and **Long term** in duration. The potential effects in relation to human receptors are considered to be **Direct**

7.2.41. For the construction phase, all the potential impacts and effects are considered to be **Temporary** and **Short term** in duration. The potential effects are considered to be **Direct**.

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## Significance

7.2.42. The EPUK & IAQM guidance (EPUK & IAQM, 2017) does not prescribe specific criteria for determining the overall significance of effects for human receptors. It recommends that professional judgement is applied to determine the overall significance.

7.2.43. The magnitude of effect matrix applied to this assessment at individual human receptors is provided in Table 7.6.

Table 7.6: Matrix for the Magnitude of the Effects at Human Receptors

Sensitivity of Receptor	Magnitude of Impacts			
	Negligible	Low	Medium	High
Low	Negligible	Negligible or Minor	Minor	Minor or Moderate
Medium	Negligible	Minor	Moderate	Moderate or Major
High	Negligible	Minor or Moderate	Moderate or Major	Major or Substantial

7.2.44. It is assumed for the purposes of this assessment that where effects of **Moderate** or greater are present at individual receptors, the overall effect of the Proposed Development will be considered **Significant** in EIA terms. Where all effects are **Negligible** at individual receptors, the overall effect of the Proposed Development will be considered **Not Significant** in EIA terms.

7.2.45. Where **Minor** effects are present as the highest magnitude of effect at individual receptors, the overall effect of the Proposed Development will be determined based on professional judgment considering the following:

- the existing and future air quality in the absence of the Proposed Development;
- the presence or absence of exceedances of the AQALs;
- the spatial extent of current and future effects at sensitive receptors; and
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.

7.2.46. For ecological receptors, significance of effect is determined by the ecological consultant, BIOSCAN, for receptors where the impacts are non-negligible and exceed the 1% criteria.

### Assumptions and Limitations

7.2.47. There are inherent uncertainties associated with the operational phase traffic model (ADMS-Urban) used in this assessment, including the uncertainties associated with the input data such as predicted traffic flows. The model itself simplifies complex physical

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systems into a range of algorithms. In addition, local micro-climatic conditions may affect the concentrations of pollutants that the ADMS model will not take into account. Despite the limitations, the assessment is considered to be robust.

7.2.48. There is a recognised study area limitation in that the study area in this ES Chapter does not include the Park Street, Bridgend AQMA where the traffic data provided by Link Transport Planning suggests the EPUK & IAQM thresholds (EPUK & IAQM, 2017) are likely to be exceeded. Any determination of magnitude of impacts and significance of effects for air quality is therefore exclusive of the potential impacts and effects that could occur within the AQMA.

7.2.49. With regards to potential air quality impacts at sensitive ecological receptors, only SACs have been assessed. Impacts at other designated sites have not been assessed.

## 7.3. Baseline Conditions

### Sensitive Receptor Locations

#### Human Receptors

- 7.3.1. There are numerous existing human sensitive receptors in the Site locale and the operational phase assessment study area.
- 7.3.2. The sensitive human receptors that have been assessed in the operational phase assessment are shown below in Table 7.7 and in Figure 7.4 and Figure 7.5 These are the worst-case locations of high sensitivity exposure based on their proximity to roads within the study area, junctions where congestion may occur, and roads that will see increases in traffic due to the Proposed Development. All human receptors were modelled at a representative ground floor breathing height of 1.5 m.

Table 7.7: Operational Phase Assessment Receptors

Receptor		Receptor Location (co-ordinates)	
		X	Y
R01	Residential (behind the Saltwater Inn)	281837	176626
R02	25 Hillsboro Pl, Porthcawl CF36 3BH	281823	176857
R03	Residential off John Street	281880	177039
R04	4 Hutchwns Terrace, Porthcawl CF36 5TN	281925	177036
R05	8 Eastern Promenade, Porthcawl CF36 5TS	282098	177022
R06	Residential off New Road	282100	177152
R07	Residential off New Road	282148	177177
R11	Newton Primary School	282484	177295
R08	Residential off New Road	282285	177233
R09	Residential off New Road	282422	177311
R10	Residential off New Road	282492	177321
R13	Residential off Heol Aldenham	283254	177401
R12	Residential off New Road	283177	177391
R14	Residential off New Road	283188	177366
R15	Residential off Bridgend Road	283574	177849
R16	Residential off Bridgend Road	283622	177876
R17	Residential off Brian Crescent	281921	177264
R18	Residential off South Road	281903	177314
R19	Residential off A4106	282364	177997
R20	Residential off A4106	282851	177821
R21	Residential off Bridgend Road	284082	178196
R22	Residential off A48 Bypass Rd	288318	179009
R23	Residential off A4229	282234	178557
R24	18 Curwen Terrace, North Cornelly, Bridgend CF33 4AW	281849	181221
R25	Residential off Porthcawl Road	281813	181140
R26	43 Cilgant Y Lein, North Cornelly, Bridgend, CF33 4AQ	282543	181264

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Receptor		Receptor Location (co-ordinates)	
		X	Y
R27	Grove Farm, A4229	282151	179673
R28	Residential in Tythegston	285723	178860

7.3.3. Proposed Receptors, P01 to P06 were also modelled within the Site itself to assess exposure of future receptors. As exposure of future sensitive receptors is not in scope of the ES Chapter, the exposure modelling is shown at Volume 3, Appendix 7.1: Air Quality Appendices.

#### Ecological Receptors

7.3.4. Ecological receptors have been assessed as part of this ES Chapter for increase in annual mean NO<sub>x</sub>, NH<sub>3</sub>, Nitrogen Deposition and Acid Deposition that could occur due to increases in vehicles air pollutions within 200 m of ecological sites.

7.3.5. Key ecological receptors in the study area include the Kenfig Dunes Special Area of Conservation (SAC) and the Cefn Cribwr Grasslands SAC.

7.3.6. A transect of receptors were modelled within these SACs within 200m of the edge of the affected roads. An initial receptor has been modelled at the closest area of each of the SACs to the affected roads, followed by a transect of receptors perpendicular to the road at an approximate spacing of 10 m distance.

7.3.7. Baseline condition for these receptors have been obtained from APIS, and figures of the modelled transects are presented in Volume 3, Appendix 7.1: Air Quality Appendices.

#### Local Air Quality Management

##### AQMAs

7.3.8. BCBC have declared the Park Street, Bridgend AQMA in 2019 for exceedances of the annual mean AQAL for NO<sub>2</sub>. Assessment of the AQMA undertaken on behalf of BCBC is contained within the AQAP (BCBC, 2025) and confirms that road traffic, predominantly diesel car models as well as Light Goods Vehicles (LGVs), contribute a large proportion of the annual mean concentrations at receptors within the AQMA.

7.3.9. This is located approximately 7.5 km to the northeast of the Site.

#### Air Quality Action Plan

7.3.10. BCBC have published the Bridgend Park Street Air Quality Action Plan (AQAP) (BCBC, 2025) which was prepared by SRS on behalf of BCBC. This AQAP outlines the priorities and

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proposed mitigation measures in order to achieve compliance with the AQALs within the Park Street AQMA.

7.3.11. Assessment reported within the AQAP also states that a 'natural compliance' study undertaken for the AQMA predicted that NO<sub>2</sub> concentrations were estimated to fall below the 40 µg/m<sup>3</sup> AQAL at all locations in the AQMA in 2026, and below the threshold of risk of exceedance of the AQAL (36 µg/m<sup>3</sup>) by 2027. It is unclear from the reporting within the AQAP if this assessment accounted for increases in traffic as caused by BCBC Local Development Plan allocations and Strategic Regeneration Policies.

### Local Air Quality Modelling

7.3.12. DEFRA's PCM modelling (DEFRA, 2020) includes predicted roadside concentrations for the A4106 located to the west of the Site. The predicted roadside concentrations of annual mean NO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> along this road are all well below the AQALs.

7.3.13. DEFRA's model predicted backgrounds are shown below in Table 7.8 for the grid squares that the Site covers for 2023 (the baseline year), and 2033 (the future assessment year). As the Site covers multiple grid squares, the average concentrations are shown.

*Table 7.8: DEFRA Modelled Background Concentrations*

Year	Grid Square (X, Y)	Annual Mean Concentration (µg/m <sup>3</sup> )		
		NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2023	(281500, 176500)	4.9	9.7	5.8
2033	(282500, 176500)	3.4	9.0	5.1
	(282500, 177500)			

7.3.14. The background concentrations are below the AQALs for all years reported and are predicted to decrease year on year as shown.

7.3.15. The DEFRA modelled background concentrations were used for assessment at human sensitive receptors.

### Local Air Quality Monitoring

7.3.16. SRS, on behalf of BCBC, undertook automatic continuous monitoring at one location in 2023. This was located within the BCBC Park Street, Bridgend AQMA over 7 km to the northeast. Based on this distance results are not reported in this ES Chapter.

7.3.17. Non automatic (passive) monitoring using diffusion tubes was undertaken at 36 sites within the BCBC area in 2023. Of these one monitoring sites is within the Site locale, with the next closest monitoring location over 5 km to the north of the Site.

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7.3.18. Diffusion Tube OBC-120, located on 105 New Road, Porthcawl, is a roadside monitoring location in Porthcawl. The results for this are shown in Table 7.9 below and Figure 7.6.

*Table 7.9: Air Quality Monitoring*

Monitoring ID	Monitoring Location		Annual Mean NO <sub>2</sub> concentration (µg/m <sup>3</sup> )				
	X	Y	2019	2020	2021	2022	2023
OBC-120	282264	177237	16	10.9	12.6	11.9	11.4

7.3.19. As agreed with the SRS, acting on behalf of BCBC, OBC-120 was used for the model verification.



## 7.4. Assessment of potential Effects, Mitigation Measures and Residual Effects

### Potential Effects

#### Construction Phase Effects

- 7.4.1. Detailed information regarding predicted vehicles movements during the construction phase was not available at the time of this assessment.
- 7.4.2. Vehicle movements associated with access, demolition and construction will vary through the construction programme, with short periods of peak HGV movements associated with demolition and the delivery of materials during the construction phase. However, when the HGV movements are averaged over a full year period (AADT), these will be significantly lower than peak movements. It is also noted that the delivery of the Proposed Development will be phased which would likely have the effect of spreading out the construction traffic and reducing the peak AADT generated. Moreover, vehicle movements associated with construction are typically significantly lower than the number of vehicle movements associated with operation of the development, which have been taken into account and directly modelled in this assessment.
- 7.4.3. Considering the above, together with the implementation of a Construction Environmental Management Plan (CEMP) and/or a Construction Traffic Management Plan (CTMP), the effects of emissions associated with construction road traffic on local air quality are considered likely to be temporary, short-term and **Not Significant**.

### Operational Phase Effects

- 7.4.4. Full results for both ecological and human receptors are presented in Volume 3, Appendix 7.1: Air Quality Appendices. They are summarised below.

#### Human Receptors

- 7.4.5. The increases in concentrations of NO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> resulting from traffic associated with the Proposed Development are predicted to have adverse air quality impacts of **Negligible** magnitude at all modelled human receptors, noting that the AQMA has not currently been assessed.
- 7.4.6. No AQALs were exceeded at any modelled receptors, and the greatest predicted adverse impact was predicted at receptor R17 where a 1.1 µg/m<sup>3</sup> increase in annual mean NO<sub>2</sub> was predicted, with a total predicted concentration of 7.7 µg/m<sup>3</sup> in the DS Scenario.

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7.4.7. Therefore, the magnitude of effect at all modelled human receptors is also **Negligible**, and the resultant effect of the Proposed Development at the modelled receptors is **Not Significant**, noting that the AQMA has not currently been assessed.

**Ecological Receptors**

7.4.8. Predicted impacts for increases in NO<sub>x</sub>, NH<sub>3</sub>, Nitrogen Deposition, and Acid Deposition are discussed below. PECs are only presented where impacts exceed the 1% screening criterion and are non-negligible.

7.4.9. With regards to the Critical Level of 30 µg/m<sup>3</sup> of NO<sub>x</sub>, all impacts at ecological receptors were below the 1% screening criteria (increases in NO<sub>x</sub> concentrations caused by the Proposed Development were less than 0.3 µg/m<sup>3</sup>). Therefore, the air quality impacts on NO<sub>x</sub> critical Loads at all assessed ecological receptors are **Negligible**. Noting that only SACs have been assessed at this stage and impacts at other designated sites may be greater.

7.4.10. With regards to the Critical Level of 1 µg/m<sup>3</sup> of NH<sub>3</sub>, impacts at the majority of ecological receptors at Kenfig Dunes SAC and all receptors at Cefn Cribwr Grasslands SAC are below the 1% screening criteria (increases in NH<sub>3</sub> concentrations caused by the Proposed Development were less than 0.01 µg/m<sup>3</sup>). Therefore, the air quality impacts on NH<sub>3</sub> critical Loads at the majority of ecological receptors at Kenfig Dunes and all of Cefn Cribwr Grasslands SAC are **Negligible**. Impacts at ECO1.1, the area of Kenfig Dunes closest to the M4, were 1.1% of the Critical Level and therefore **non-negligible**. NH<sub>3</sub> PECs for the DM and DS scenarios are presented in Volume 3, Appendix 7.1: Air Quality Appendices where it can be seen that the Critical Level of 1 µg/m<sup>3</sup> NH<sub>3</sub> is exceeded in both scenarios at multiple receptors modelled within the Kenfig Dunes SAC due to baseline concentrations.

7.4.11. Nitrogen Deposition impacts at all modelled receptors at Cefn Cribwr Grasslands SAC were below the 1% screening threshold of the lower Critical Load of 5 kg N/ha/year. Therefore, all impacts were **Negligible**.

7.4.12. Nitrogen Deposition impacts exceeded the 1% screening criteria of the Lower Critical Load of 5 kg N/ha/year at ECO1.1 to ECO1.3 at Kenfig Dunes (an area up to approximately 50 m from the edge of the active traffic lanes of the M4), and therefore impacts are **non-negligible**. PECs for the DM and DS scenarios were predicted and show both the lower and higher Critical Loads (5 and 10 kg N/ha/year) are predicted to be exceeded in both the DM and DS scenarios at these receptors due to baseline concentrations.

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7.4.13. Predicted nitrogen acid deposition impacts at all modelled receptors were below the 1% screening criteria of the lower Critical Level for acid deposition. Therefore, acid deposition impacts at all receptors are **Negligible**. Noting that only SACs have been assessed at this stage and impacts at other designated sites may be greater.

7.4.14. Reference should be made to Volume 1, Chapter 9: Ecology prepared by BIOSCAN on the significance of the effect of the predicted air quality impacts on the Kenfig Dunes and Cefn Cribwr Grasslands SAC. Noting that only SACs have been assessed at this stage and impacts at other designated sites may be greater.

**Mitigation and Enhancement Measures****Construction Phase**

7.4.15. Air quality effects of construction phase traffic are considered to be **Not Significant**. However, it is recommended a CEMP and or a CTMP are secured to ensure appropriate routing and management of construction traffic routes which would help control and minimise any effect of construction traffic.

7.4.16. The CEMP and CTMP should consider Heavy Goods Vehicles (HGV) and other construction traffic movements, including details of routing and times of day of movements. HGV access should be prevented or minimised, where possible, on traffic sensitive roads, residential streets, congested roads or unsuitable junctions.

**Operational Phase****Human Receptors**

7.4.17. No significant effects have been predicted at human receptors and therefore additional mitigation is not considered to be required for the impacts assessed, noting that the AQMA has not currently been assessed

7.4.18. However, Link Transport Planning have advised that a Travel Plan should be secured by planning condition. A Travel Plan would set out a proposed package of measures which would be introduced in order to encourage residents, staff, and visitors to travel to and from the Site via sustainable modes. This would be beneficial for air quality where the overall traffic generation from the Proposed Development was reduced as a result.

**Ecological Receptors**

7.4.19. Reference should be made to Volume 1, Chapter 9: Ecology prepared by BIOSCAN regarding mitigation, if required, to address the effect of the predicted air quality impacts on the Kenfig Dunes and Cefn Cribwr Grasslands SAC. Noting that only SACs have been

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assessed at this stage and air quality impacts at other designated sites have not been considered.

**Residual Effects**

## Construction Phase Residual Effects

7.4.20. As construction phase traffic effects before mitigation are considered to be **Not Significant**, residual effects are also **Not Significant**.

## Operational Phase Residual Effects

7.4.21. As operational phase traffic effects at modelled human receptors before mitigation are predicted to be **Not Significant**, the associated residual effects at these receptors are also **Not Significant**, noting that the AQMA has not currently been assessed.

7.4.22. Reference should be made to Volume 1, Chapter 9: Ecology prepared by BIOSCAN regarding residual effects of the predicted air quality impacts on the Kenfig Dunes and Cefn Cribwr Grasslands SAC. Noting that only SACs have been assessed at this stage and air quality impacts at other designated sites have not been considered.

**Cumulative Effects**

7.4.23. As outline previously in this ES Chapter, cumulative effects have not been considered, and it was agreed within the BCBC Scoping Opinion response this could be scoped out of the EIA.

## 7.5. Conclusions

7.5.1. This chapter has assessed the likely environmental effects of the Proposed Development with respect to air quality at both human and ecological receptors.

7.5.2. The following air quality effects were scoped out of this ES chapter:

- The assessment of construction phase dust and PM<sub>10</sub> during the construction phase. A construction dust risk assessment has been undertaken in line with IAQM guidance in Volume 3, Appendix 7.1: Air Quality Appendices.
- The main energy strategy throughout the Proposed Development would avoid combustion, consisting of Air Source Heat Pumps (ASHPs) or similar. Therefore, the main energy strategy does not require further assessment within this ES Chapter as it would not result in any air pollutant emissions and the effects are considered to be **Not Significant**.
- Any potential odour impacts from food and beverage use could be suitable controlled via KORAs undertaken at the detailed design stage.
- Finally, the exposure to future receptors at the Site to potential poor air quality is not considered to fall within the requirements of this Chapter and has been assessed within Volume 3, Appendix 7.1: Air Quality Appendices.

7.5.3. The potential air quality effects of the construction and operational phase traffic of the Proposed Development have been scoped into this ES Chapter.

7.5.4. The construction phase traffic air quality effects are considered likely to be temporary, short-term and **Not Significant**. It is recommended a CEMP and or a CTMP are secured to ensure appropriate routing and management of construction traffic routes which would help control and minimise any effect of construction traffic.

7.5.5. The operational phase effects have been assessed via dispersion modelling. The increases in concentrations of NO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> caused by the Proposed Development are predicted to have adverse air quality impacts of **Negligible** magnitude at all modelled human receptors. No AQALs were exceeded at any modelled receptors.

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- 7.5.6. Therefore, the magnitude of effect at all modelled human receptors is also **Negligible**, and the overall effect of the Proposed Development is **Not Significant**, noting that the AQMA has not currently been assessed.
- 7.5.7. Operational Phase impacts at Kenfig Dunes and Cefn Cribwr Grasslands SACs have been assessed. Noting that only SACs have been assessed at this stage and air quality impacts at other designated sites have not been considered and may be greater. Predicted impacts for increases in NO<sub>x</sub>, NH<sub>3</sub>, Nitrogen Deposition, and Acid Deposition have been assessed. PECs are presented where impacts exceed the 1% screening criterion and are non-negligible. Impacts at Kenfig Dunes for NH<sub>3</sub> and Nitrogen Deposition are **non-negligible**. Reference should be made to Volume 1, Chapter 9: Ecology prepared by BIOSCAN on the significance of the effect of the predicted air quality impacts on the Kenfig Dunes and Cefn Cribwr Grasslands SAC, and any required mitigation and residual effects.

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