10. Air Quality

10.1. Introduction

10.1.1. This chapter of the ES has been prepared by Hoare Lea and assesses the potential likely significant effects of the Proposed Development with regards to air quality. Effects associated with enabling and construction activities and the operation of the Proposed Development upon completion are identified as appropriate and, where necessary, mitigation measures are outlined.

10.1.2. The focus is on the potential likely significant effects to air quality which would be generated by the Proposed Development at existing sensitive receptors during the following processes.

- Dust emissions during the construction phase of the Proposed Development; and
- Road Traffic emissions during the Construction and Operational phases.

10.1.3. The pollutants of concern for human health from construction and operational road traffic are nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$). During construction, there is also the potential for impacts to occur from dust soiling and elevated PM_{10} emissions.

10.1.4. This Chapter is supported by a series of technical appendices:

- **Appendix 10.1**: Legislation, Policy and Guidance Documents
- **Appendix 10.2:** Environmental Health Officer Consultation
- **Appendix 10.3**: Construction Dust Assessment
- **Appendix 10.4:** Road Traffic Modelling Methodology
- **Appendix 10.5:** Full Modelling Results

10.2. Assessment Approach

Legislative and Policy Framework

10.2.1. The following legislation and policy have informed the assessment of effects within this Chapter and is detailed further in **Appendix 10.1:**

- European Union Directive 2008/50/EC[1];
- European Union Directive 2016/2284[2];
- Environment Act 1995[3];

[1] The European Parliament and the Council of the European Union, (2008). Directive 2008/50/EC of the European Parliament and of the Council. Available: https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32008L0050 [Accessed: 28/01/2025].
[2] The European Parliament and the Council of the European Union, (2016). Directive 2016/2284 of the European Parliament and of the Council. Available: https://www.legislation.gov.uk/eudr/2016/2284/introduction. [Accessed: 28/01/2025].
[3] The Stationery Office, (2018). Environment Act 1995. Available: https://www.legislation.gov.uk/ukpga/1995/25/part/IV. [Accessed: 28/01/2025].

- Environment Act 2021[4];
- Building Regulations (2021)[5];
- Air Quality Strategy[6];
- Environmental Protection Act (EPA) 1990[7];
- Air Quality Standards Regulations 2010[8];
- The Air Quality Standards (Amendment) Regulations 2016[9]; and
- Clean Air Strategy 2019[10];
- National Planning Policy Framework[11]; and
- The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[12];
- Broxtowe Borough Council Part 2 Local Plan[13] 2018-2028;
- Toton and Chetwynd Barracks Strategic Masterplan Supplementary Planning Document (SPD) (February 2023)[14]; and
- Air Quality Strategy for Nottingham and Nottinghamshire[15].

10.2.2. The following guidance has informed the assessment of effects within this Chapter and is detailed further in **Appendix 10.1:**

- Planning Practice Guidance[16];

[4] The Stationery Office, (2021). Environment Act 2021. Available: https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted. [Accessed: 28/01/2025].
[5]HMSO (2021). The Building Regulations 2021. Approved Document Part F: Ventilation
[6] Defra (2023) Air Quality Strategy: framework for local authority delivery [online] – http://www.gov.uk/government/consultations/revised-national-air-quality-strategy [Accessed: 28/01/2025].
[7]The Stationery Office, (1990). Environmental Protection Act 1990. Available: https://www.legislation.gov.uk/ukpga/1990/43/contents. [Accessed: 28/01/2025].
[8] The Statutory Office, (2010). Statutory Instrument 2010, No 1001, The Air Quality Standards Regulations 2010. Available: https://www.legislation.gov.uk/uksi/2010/1001/contents/made. [Accessed: 28/01/2025].
[9]The Stationery Office (2016) Statutory Instrument 2016, No 1184, The Air Quality Standards (Amendment) Regulations 2016, London
[10]Defra, (2019). The Clean Air Strategy. Available: assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf. [Accessed: 28/01/2025].
[11] Ministries of Housing, Communities & Local Government, (2024). National Planning Policy Framework. Available: https://www.gov.uk/government/publications/national-planning-policy-framework--2. [Accessed: 28/01/2025].
[12] Environmental Protection (2023) The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. Available: The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. [Accessed: 28/01/2025)
[13] Broxtowe Borough Council (2019) Part 2 Local Plan 2018-2028 – [online] available at: https://www.broxtowe.gov.uk/media/7088/part-2-local-plan-adopted-october-2019.pdf [Accessed: 28/01/2025].
[14] Broxtowe Borough Council (2023) Toton and Chetwynd Barracks Strategic Masterplan Supplementary Planning Document [online] available at: Toton and Chetwynd SPD February 2023 (broxtowe.gov.uk) [Accessed: 28/01/2025].
[15] Nottingham City Council (2020) Air Quality Strategy for Nottingham and Nottinghamshire 2020 – 2030 – [online], https://committee.nottinghamcity.gov.uk/documents/s107973/Notts%20AQ%20Strategy%202020%20FINALv1.0.pdf [Accessed: 28/01/2025].
[16] Ministries of Housing, Communities & Local Government, (2019) Planning Practice Guidance. Available: https://www.gov.uk/government/collections/planning-practice-guidance. [Accessed: 28/01/2025].

- Defra Local Air Quality Management Technical Guidance[17] which has been referred to as 'LAQM.TG.22' throughout this Chapter;
- Defra $PM_{2.5}$ Targets: Interim Planning Guidance[18]
- Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) Land-Use Planning & Development Control: Planning for Air Quality guidance[19] which has been referred to as the 'EPUK/IAQM guidance' throughout this Chapter;
- IAQM Guidance on the Assessment of Dust from Demolition and Construction[20] which has been referred to as the 'IAQM demolition and construction guidance' throughout this Chapter;
- IAQM Guidance on the Assessment of Air Quality Impacts on Designated Nature Conservation Sites[21]
- Design Manual for Roads and Bridges (DMRB) guidance[22];

National Planning Policy

10.2.3. The relevant sections of the National Planning Policy Framework[11] relating to air quality have been outlined in more detail in **Appendix 10.1** and have been considered in this assessment.

Air Quality Strategy

10.2.4. The European Union has set limit values for NO_2, PM_{10} and $PM_{2.5}$; these are legally binding and have been implemented into English legislation by *The Air Quality Standards Regulations 2010* and *The Air Quality Standards (Amendment) Regulations 2016*.

10.2.5. The Air Quality Objectives (AQOs) for NO2, PM_{10} and $PM_{2.5}$ are set out in **Table 10.1**. The AQOs for NO_2, PM_{10} and $PM_{2.5}$ were to have been achieved by 2005, 2004 and 2020 respectively and continue to apply in all future years thereafter.

10.2.6. The Environment Act 2021 acts as the UK's new framework of environmental protection and came into force on 1st April 2022. With regard to air quality, the Environment Act establishes a legally binding duty on government to bring forward at least two new air quality targets in secondary legislation. This was implemented through the Environmental Improvement Plan which outlines new $PM_{2.5}$ targets for future years. These are a long-term target of 10 $\mu g/m^3$ by

[17]Defra, (2022). Local Air Quality Management Technical Guidance (TG22). Available: https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf [Accessed: 28/01/2025].

[18]Defra (2024) $PM_{2.5}$ Targets: Interim Planning Guidance. Available: PM_{2.5} Targets: Interim Planning Guidance - Defra, UK. [Accessed: 28/01/2025].

[19] Environmental Protection UK and Institute of Air Quality Management, (2017). Land-Use Planning & Development Control: Planning for Air Quality. Available: https://iaqm.co.uk/guidance/. [Accessed: 28/01/2025].

[20]Institute of Air Quality Management (2024) Guidance on the assessment of dust from demolition and construction v2.2 – [online] available at: https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf [Accessed: 28/01/2025].

[21] Institute of Air Quality Management (2020), A guide to the assessment of air quality impacts on designated nature conservation sites [online] available at: https://iaqm.co.uk/guidance/ [Accessed: 28/01/2025]

[22] Standards for Highways (2024) Design Manual for Roads and Bridges LA 105 Air Quality version 0.1.0 [Accessed: 28/01/2025], Available at: https://www.standardsforhighways.co.uk/tses/attachments/af7f4cda-08f7-4f16-a89f-e30da703f3f4?inline=true

2040 and an interim target of 12 µg/m^3 by 31st January 2028. These targets are expected to focus on reducing concentrations of, and exposure to, $PM_{2.5}$.

10.2.7. Additionally, a new Air Quality Strategy has been published in April 2023 which sets out a framework which should be followed by local authorities in support of DEFRA's long term air quality goals including new $PM_{2.5}$ targets.

Table 10.1: Air Quality Objectives for NO_2, PM_{10} and $PM_{2.5}$

Pollutant	Time Period	Objective
NO_2	1-hour Mean	200 µg/m^3 Not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m^3
PM_{10}	24-hour Mean	50 µg/m^3 Not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m^3
$PM_{2.5}$	Annual Mean	20 µg/m^3
µg/m^3 – microgram per cubic meter.		

10.2.8. The AQOs apply at locations where members of the public are likely to be regularly present and exposed over the averaging period of the AQO. Examples of where the annual mean AQOs should apply are provided in LAQM.TG(22)[17] and include: building façades of residential properties, schools, hospitals. The annual mean AQOs are not relevant for the building façades of offices or other places of work where members of the public do not have regular access, kerbsides or gardens.

10.2.9. The 24-hour mean AQO for PM_{10} is considered to apply at the same locations as the annual mean AQO, as well as in gardens of residential properties and at hotels.

10.2.10. The 1-hour mean AQO for NO_2 also applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations, pavements of busy shopping streets, carparks and bus stations which are not fully enclosed. The 1-hour mean AQO does not apply at kerbside sites where the public do not have regular access.

<u>The Broxtowe Borough Council Local Plan</u>

10.2.11. Broxtowe Borough Council's (BBC) Local Plan provides a guide for development and growth within BBC's administrative area and sets out key issues faced by the BBC up until 2028 and co-ordinates policies, priorities and programmes with public resources for delivery. BBC's Local Plan has been split into two separate documents: The Part 1 Local Plan: Core Strategy and Part 2 Local Plan.

10.2.12. The Part 1 Local Plan: Core Strategy was adopted in 2014 and contains no policies with regard to air quality.

10.2.13. The Part 2 Local Plan was adopted in 2019 and contains two policies regarding air quality as shown below:

Policy 20: Air Quality

"1. For any development proposals, all reasonable steps will be required to be taken to provide effective alternatives for users of the development to utilise modes of transport other than the private car.

2. Permission will not be granted for development which would directly result in a significant deterioration in air quality either through poor design or as a consequence of site selection.

3. Electric Vehicle charging points will be required in all housing developments of 10 or more houses and commercial developments of 1,000 square metres or more of floorspace."

Policy 19: Pollution, Hazardous Substances and Ground Conditions

"1. Permission will not be granted for development which would result in:

[…]

a) An unacceptable level of pollution, or is likely to result in unacceptable exposure to sources of pollution

Methodology

Construction

Dust Emissions from Construction Phase

10.2.14. The assessment of construction dust impacts has been undertaken in line with the IAQM Construction Guidance methodology. Full construction dust methodology is available in **Appendix 10.3**. Activities on the proposed construction site have been divided into three types to reflect their different potential impacts. These are:

- Earthworks;
- Construction; and
- Trackout.

10.2.15. There are no demolition works required at as part of the Proposed Development, and so the potential impacts of demolition activities have not been considered.

10.2.16. The risk of dust emissions was assessed for each activity with respect to:

- Potential loss of amenity due to dust soiling; and
- The risk of health effects due to Significant increase in exposure to PM_{10}.

10.2.17. The first stage of the assessment involves screening to determine whether there are any existing sensitive receptors within the threshold distances defined by the IAQM Construction Guidance. A detailed assessment of the impact of dust from construction sites will be required where:

- A 'human receptor' is located within 50m of the boundary of the Site or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the Site entrance; and

- An 'ecological receptor' is located within 50m of the boundary of the Site or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the Site entrance.

10.2.18. The magnitude of dust emission for each activity is determined on the basis of the guidance, indicative thresholds, information available relating to the project and expert judgement. The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area. The risk of impact is then used to determine the mitigation requirements.

10.2.19. Descriptors for magnitude of impact and impact significance criteria used in the assessment of construction phase dust are outlined in **Appendix 10.3**, in line with the IAQM guidance[20].

10.2.20. Due to the scale/magnitude of the Proposed Development alongside the proximity of nearby sensitive receptors such as residential properties and education buildings, the Site is considered to have a high risk of impact when unmitigated. This is considered a worst case, robust assessment. An assessment of construction dust risk is outlined within **Appendix 10.3.**

10.2.21. It is anticipated that dust and particulate matter emissions produced during construction phase activities would be inherently controlled through the implementation of a Construction Environmental Management Plan (CEMP), to be secured by condition, to a negligible impact level. The type of mitigation measures required to control the fugitive dust emission during the construction phase will be outlined within the CEMP and measures are listed within **Appendix 10.3**.

Construction Phase Traffic Emissions

10.2.22. The impacts of vehicle emissions (NO_2, PM_{10} and $PM_{2.5}$) associated with the construction of the Proposed Development have the potential to affect existing sensitive human and ecological receptors located at the roadside of the proposed construction traffic route.

10.2.23. The EPUK/IAQM planning guidance[19] sets out thresholds for traffic generation for both construction and operational phases, that have the potential to cause impacts to air quality at which point a detailed assessment of road traffic impacts should be undertaken. As the Proposed Development is not within or adjacent to an Air Quality Management Area (AQMA) the criteria considered for this assessment are as follows:

- Change of light duty vehicles (LDV) flows of more than 500 annual average daily traffic (AADT); and

- Change of heavy-duty vehicles (HDV) flows of more than 100 AADT.

10.2.24. Additionally, as the construction traffic flows associated with the Proposed Development have the potential to be routed into an adjacent AQMA, the more stringent criteria of an increase of 100 AADT LDV and 25 AADT HDV also applies to these roads, for robustness.

10.2.25. The criteria of 1000 AADT and/or 200 HDV AADT increase will be considered for designated ecological receptors within 200m of the road which may be impacted by construction phase traffic, as outlined within IAQM guidance for designated sites[Error! Bookmark not defined.] and Design Manual for Roads and Bridges (DMRB)[22].

Non -Road Mobile Machinery (NRMM) emissions screening

10.2.26. Non-Road Mobile Machinery (NRMM) refers to mobile machines, transportable industrial equipment or vehicles which are fitted with an internal combustion engine and not intended for transporting goods or passengers on roads. Exhaust emissions of oxides of nitrogen (NO_X), PM_{10} and $PM_{2.5}$ from NRMM associated with construction sites may have a significant effect on local air quality. These NRMM emissions have been screened in line with IAQM construction guidance[20].

10.2.27. On that basis, there are expected to be no likely significant effects to air quality at existing sensitive human receptors from NRMM emissions.

Operational Phase

Combustion Sources

10.2.28. As no combustion plant is to be present on Site, it is not anticipated that there are any potential likely significant environmental effects from operational phases of the Proposed Development as there will be no combustion emissions during the operational phase of the Proposed Development; no further consideration is made to the operational combustion sources within this Chapter.

Road Traffic Emissions

10.2.29. The determination of roads for use in the air quality assessment has been based on the criteria detailed within the EPUK/IAQM guidance which states that for developments outside of an AQMA, an increase of 500 AADT LDV or an increase of 100 AADT HDV will apply. Additionally, as the operational traffic flows associated with the Proposed Development are anticipated to be routed into an adjacent AQMA, an increase of 100 AADT LDV and 25 AADT HDV also applies for these roads.

10.2.30. Full detailed of the Operational Phase Methodology are provided in **Appendix 10.4**.

10.2.31. For the operational phase, the following scenarios have been modelled:

- 2023 Verification Year;
- 2030 Do-Minimum (DM) (predicted traffic flows in 2030, without the Proposed Development);
- 2030 Do-Something (DS) (predicted traffic flows in 2030, with additional flows from the Proposed Development);
- 2030 In Combination Do-Something (IC-DS) (predicted traffic flows in 2030, which include development flows from the Proposed Development, alongside the additional development flows from the 'scoped in cumulative sites' 'Land at Toton East' and 'Land at Toton North').

10.2.32. The 2023 Verification Year scenario used the 2023 emissions factor and 2023 predicted Defra background concentrations.

10.2.33. As a worst-case assumption, despite only the 'scoped in cumulative site' 'Land at Toton East' being intended to be operational in the future year of 2030, the operational traffic flows on the

local road network associated with the Proposed Development and the other 'scoped in cumulative site' of 'Land at Toton North' (with anticipated opening years of 2041) have also been included in the 2030 IC-DS scenario, so as to provide a robust and worst-case cumulative assessment.

10.2.34. It should be noted that future year emission factors for the earliest Proposed Development opening year (2041) currently aren't available. The regression analysis in **Appendix 10.4**, indicated that NO_2 concentrations recorded in the vicinity of the Site over the last five years of representative monitoring data have shown a reduction in concentrations, which identified a statistically significant trend. The future emissions year and background concentrations are therefore considered representative of future model scenarios.

10.2.35. As such, the emission factors for the future modelling scenarios will be 2030 and predicted Defra background concentrations from 2030 will be used within the detailed assessment. Further Details of the modelling input and methodology are provided within **Appendix 10.4**.

10.2.36. It should be noted that the 2030 DM, 2030 DS and 2030 IC-DS scenarios also include development flows from the other 'scoped in cumulative sites' agreed with BBC, outlined in **Chapter 2: Assessment Scope and Methodology**. As such, this assessment considers cumulative impact inherently within it. The cumulative list is included within this Environmental Statement within **Table 2.5 in Chapter 2.**

10.2.37. Out of the three adjacent cumulative schemes, only the two 'Land at Toton East' and 'Land at Toton North' schemes have been considered further for cumulative effects of the operational stage, with the Southfields Farm Battery Energy Storage System (BESS) facility discounted from the assessment, due to the nature of the Southfields Farm BESS facility, with minimal traffic flows anticipated for its operation

10.2.38. The IC-DS scenario includes the development flows of the adjacent cumulative schemes 'Land at Toton East' and 'Land at Toton North', and so considers cumulative impacts. The change in concentration of NO_2, PM_{10} and $PM_{2.5}$ as a result of operational phase traffic emissions have been predicted at a number of existing sensitive human receptors located in the vicinity of the Proposed Development, to assess impacts on both the long term (annual mean) and short term (1-hour mean for NO_2 and 24-hour mean for PM_{10}) pollutant concentrations.

10.2.39. The annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ are to be modelled at existing sensitive human receptors, which will be compared to the respective annual mean AQOs. For assessing the short term objective impacts of the 1-hour mean NO_2 and 24-hour mean PM_{10} concentrations, the annual mean NO_2 and PM_{10} concentrations will be compared against the below criteria:

1-hour mean NO_2

10.2.40. In line with LAQM.TG(22)[17], an annual mean NO_2 concentration of 60 µg/m^3 or above is often used to indicate a possible exceedance of the 1-hour mean NO_2 AQO. As such, the modelled annual mean NO_2 concentrations at existing sensitive human receptors will be compared against the 60 µg/m^3 threshold as a trigger level to indicate potential exceedance of the 1-hour mean NO_2 AQO.

24-hour mean PM_{10}

10.2.41. In line with LAQM.TG(22)[17], the annual mean PM_{10} concentrations modelled at existing sensitive receptors can be used to estimate the number of annual 24-hour mean exceedances, if the

annual mean PM_{10} concentrations are above the annual mean threshold of 14.8 µg/m^3. This is done using the following relationship:

"No. 24-hour mean exceedances = - 18.5 + 0.00145 x annual mean^3 + (206/annual mean)"

Site Suitability

10.2.42. A Site Suitability Assessment of the pollutant concentrations predicted at future sensitive receptors within the Site has been screened out, with baseline pollutant concentrations in the vicinity of the Site in 2023 demonstrating compliance with the relevant annual mean, 1-hour mean and 24-hour mean AQOs for NO_2, PM_{10} and $PM_{2.5}$ in the vicinity of the Site, as outlined further in **Section 10.5.**

10.2.43. The pollutant concentrations recorded in 2023 at the closest automatic monitoring sensor to the Site, a roadside station set back approximately 2m from the curb, are well within their AQOs at 39% of the annual mean NO_2 AQO, 31% of the annual mean PM_{10} AQO and 40% of the annual mean $PM_{2.5}$ AQO respectively. As the Proposed Development is set back at a minimum distance of 5m from the B6003, the pollutant concentrations at the Site are likely to be lower than those recorded at the closest automatic monitoring station in 2023.

10.2.44. As such, the additional traffic associated with the operational phase of the Proposed Development is unlikely to increase the local NO_2, PM_{10} and $PM_{2.5}$ concentrations above their respective AQOs at potential future sensitive receptor locations. Therefore, a Site Suitability Assessment has been screened out of the assessment.

Sensitive Receptors

Dust Emissions from Construction Phase

10.2.45. Existing sensitive receptors at the roadside of the construction traffic routes, have the potential to be affected by an increase in emissions of NO_2, PM_{10} and $PM_{2.5}$ from construction traffic for the duration of the construction phase.

10.2.46. For fugitive dust emissions, high sensitivity human receptors within 250m of the Site boundary or 50m from the construction vehicle route up to 250m distance from the Site entrance, have been identified in line with the IAQM guidance.

10.2.47. Additionally, the locally designated ecological receptors, Toton Fields Local Nature Reserve (LNR) and Toton Sidings Local Wildlife Site (LWS) have been identified within 20m south, and west, of the Site boundary respectively, which falls within the IAQM guidance distance criteria of 50m distance from the Site boundary. However, due to the local designation of these habitat, they are classed as a low sensitivity ecological receptor to construction dust risk from on-site activities, in line with the IAQM guidance[20].

10.2.48. Impacts have been determined at distance boundaries of 20m, 50m, 100m and 250m for earthworks and construction activities and at 50m for trackout activities.

10.2.49. A visual representation of these distance buffers is provided in **Figure A10.1** within **Appendix 10.3 ' Construction Dust Assessment'** for earthworks, construction and trackout.

Construction Phase Traffic Emissions

10.2.50. There are high sensitivity receptors including residential dwellings and schools located along the proposed construction routes. Construction routes associated with the Proposed Development are outlined within Chapter 9 'Transport and Access'. Commercial uses are also included; however, they are considered to be low sensitivity receptors.

10.2.51. There are no internationally designated ecological sites within 200m of the proposed construction routes, therefore there are no likely significant effects to national sensitive habitats or species.

10.2.52. The closest ecological receptors to the Site are the statutory designated Toton Fields Local Nature Reserve (LNR) located within 20m south of the Site, alongside the Toton Sidings LWS, located within 20 m west of the Site. However, this LNR and LWS are set back at a distance of approximately 500m and 700m from the B6003 at the east respectively, a proposed construction vehicle route to the Site. The Toton Sidings LWS is also set back at approximately 300 m from the A52 at the north, another proposed construction vehicle route. Therefore, both the LNR and LWS fall beyond the DMRB guidance[22] threshold of 200m from an anticipated construction vehicle route requiring for a detailed assessment of construction phase traffic emissions on ecological sites. As such, both the Toton Fields LNR and Toton Sidings LWS have not been considered within the assessment of construction phase traffic emissions on ecological sites.

10.2.53. However, as confirmed by the Applicant's ecologist, there are two designated ecological sites which fall within the DMRB guidance[22] threshold of 200m for a detailed assessment of construction phase traffic emissions on ecological sites. These consist of Bluebell Wood LWS, located 1.5km to the north of the Site, which is set back approximately 95m from the A52, a proposed construction vehicle route to the Site. Additionally, the statutory designated ecological receptor King Georges Park LNR, located approximately 2.1km northeast of the Site, is located within closer proximity of the A52, set back at 85m. As such, both King Georges Park LNR and Bluebell Wood LWS have been considered within the assessment of construction phase traffic emissions on ecological sites.

10.2.54. The location of the Toton Fields LNR, King Georges Park LNR and Bluebell Wood LWS in the vicinity of the Site is shown in **Figure 7.1: Designated Sites .**

10.2.55. It is to note that, as confirmed by the Applicant's ecologist, that given that the King Georges Park LNR and Bluebell Wood LWS are both already located within a highly urbanised area, existing levels of pollution will limit the quality of habitats interest. As levels of pollutants can be reasonably expected to exponentially decline with distance from the source, the location of the A52 at a minimum of 85m away, means that any impact from construction phase traffic emissions would be **negligible**. Therefore, the effect of construction phase traffic emissions as a result of the construction traffic flows on the two existing ecological receptors would be **insignificant**.

Operational Phase Traffic Emissions

10.2.56. Receptors have been identified to represent worst-case locations (these being at the façades of the residential properties closest to the road sources), as outlined in the LAQM.TG(22)[17] guidance. When selecting receptors, particular attention has been paid to assessing impacts close to junctions, where traffic may become congested and where there is a combined effect of several road links, and close to those roads where the traffic increases as a result of the Proposed Development will be greatest.

10.2.57. As confirmed by the Applicant's ecologist, the two designated ecological receptors, King George's Park LNR, and Bluebell Wood LWS have been identified as the closest ecological receptors to proposed operational traffic routes at distance of 85m and 95m from the A52 respectively, an anticipated operational route to the Proposed Development and the two cumulative schemes 'Land at Toton East' and 'Land at Toton North'. The location of the LNR and LWS in the vicinity of the Site is shown in **Figure 7.1: Designated Sites**. In line with the IAQM guidance for designated sites[21] and DMRB guidance[22], the operational traffic flows provided by the Applicant's transport consultants have confirmed that the 1000 total AADT criterion has the potential to be exceeded for operational traffic flows associated with both the Proposed Development along this road and also in the In-Combination DS scenario.

10.2.58. However, as confirmed by the Applicant's ecologist, given that both the King Georges Park LNR and Bluebell Wood LWS are already located within a highly urbanised area, existing levels of pollution will limit the quality of habitats interest. As levels of pollutants can be reasonably expected to exponentially decline with distance from the source, the location of the A52 at a minimum distance of 85m away, means that any impact from operational traffic emissions would likely be **negligible**. Therefore, further assessment of the effect of operational phase traffic emissions as a result of the additional DS and IC-DS scenario operational traffic on the existing King Georges Park LNR and Bluebell Wodd LWS ecological receptors has been screened out.

10.2.59. Existing human sensitive receptors within 200m of the roads used by future users and residents of the Proposed Development have also been identified, in line with EPUK/IAQM guidance are presented in **Table 10.2**, which have been assessed to present what is considered to be the worst-case locations. The locations of these existing sensitive human receptors identified within 200m of operational traffic routes are illustrated in **Figure 10.1** and are also outlined in **Table 10.2**. There are 30 existing highly sensitive receptors identified in the vicinity of the Site (26 residential, 4 educational) alongside two existing lower sensitivity commercial receptors to represent worst-case locations to potential pollutant exposure in the vicinity of the Site, in line with LAQM.TG(22) guidance[17]. Therefore,32 existing sensitive receptors have been assessed.

10.2.60. The two lower sensitivity commercial receptors in the vicinity of the Site are anticipated to be at lower risk of adverse impacts in comparison to the remaining 30 high sensitivity residential and educational receptors in the vicinity of the Site, as only the short-term averaging periods (1-hour mean) apply at the lower sensitivity commercial receptors due to the shorter period of time anticipated to be spent at these locations. In line with the IAQM guidance, only the 1-hour mean NO_2 AQO applies to the two lower sensitivity commercial receptors in the vicinity of the Site. This is in comparison with the high sensitivity residential and educational receptors in the vicinity of the Site which are classed to be at risk for the annual mean, 1-hour mean, and 24-hour mean AQOs relevant for NO_2, PM_{10} and $PM_{2.5}$.

10.2.61. Ground level floors have been modelled to be representative of worst-case air pollutant concentrations, except at one highly sensitive residential receptor (R23 at **Figure 10.1**) which has been modelled at a height of 4.4m to represent the anticipated pollutant concentrations at first floor level.

10.2.62. The Long Term (LT) receptors (i.e., annual means) and Short Term (ST) receptors (i.e. hourly and 24-hour) are outlined as per the LAQM.TG (22) guidance[17], with the annual, daily hourly AQOs both applicable to the 30 highly sensitive existing residential and educational receptors, as outlined in **Table 10.2**. Only the short term AQOs are applicable to the two lower sensitivity commercial receptors.

Table 10.2 Existing Sensitive Human Receptors Identified

Existing Sensitive Receptor ID	Heights (m)	Location	OS Grid Reference (m)		Existing Sensitive Receptor Type	Long Term (LT) or Short Term (ST)
			X	Y		
R1	1.5	George Spencer Academy	449406	336137	Educational	LT/ST
R2	1.5	Sports Hall - George Spencer Academy	449329	336132	Educational	LT/ST
R3	1.5	George Spencer Academy	449402	336078	Educational	LT/ST
R4	1.5	Netball Courts - George Spencer Academy	449243	336075	Educational	LT/ST
R5	1.5	24 Brampton Drive	449532	336208	Residential	LT/ST
R6	1.5	Japanese Water Gardens	449545	336019	Commercial	ST
R7	1.5	273 Stapleford Lane	449687	335526	Residential	LT/ST
R8	1.5	1 Katherine Drive	449746	335481	Residential	LT/ST
R9	1.5	23 Silverdale	449198	336121	Residential	LT/ST
R10	1.5	14 Carnforth Close	448900	336086	Residential	LT/ST
R11	1.5	39 Mountfield Avenue	447524	335816	Residential	LT/ST
R12	1.5	12 Woburn Court	447405	335653	Residential	LT/ST
R13	1.5	11 Richmond Avenue	447349	335771	Residential	LT/ST
R14	1.5	167 Derby Road	450560	337914	Residential	LT/ST
R15	1.5	1 Hanley Avenue	450697	337956	Residential	LT/ST
R16	1.5	69 Derby Road	451101	338098	Residential	LT/ST
R17	1.5	40 Derby Road	451382	338127	Residential	LT/ST
R18	1.5	3 Lowes Court	451778	338095	Residential	LT/ST
R19	1.5	215 Derby Road	451626	338051	Residential	LT/ST
R20	1.5	320 Wollaton Road	452145	338089	Residential	LT/ST
R21	1.5	41 Derby Road	452449	338166	Residential	LT/ST
R22	1.5	Dominos Pizza	452703	338262	Commercial	ST
R23	4.4	Flat above Dominos	452703	338262	Residential	LT/ST
R24	1.5	Derby Road	453094	338315	Residential	LT/ST
R25	1.5	Bembridge Court	450405	337730	Residential	LT/ST
R26	1.5	114 Derby Road	450954	338107	Residential	LT/ST
R27	1.5	170 Derby Road	452064	338118	Residential	LT/ST
R28	1.5	26 Derby Road	452524	338220	Residential	LT/ST

Existing Sensitive Receptor ID	Heights (m)	Location	OS Grid Reference (m)		Existing Sensitive Receptor Type	Long Term (LT) or Short Term (ST)
			X	Y		
R29	1.5	5 Derby Road	452639	338197	Residential	LT/ST
R30	1.5	10 Windsor Court	447627	335793	Residential	LT/ST
R31	1.5	63 Westerlands	449756	336585	Residential	LT/ST
R32	1.5	23 Woodside Road	452795	338223	Residential	LT/ST

10.2.63. It should be noted that this is not an exhaustive list and there may be other locations within the vicinity of the Site which may experience air quality impacts as a result of traffic generated by the Proposed Development that have not been individually assessed.

Scoping Criteria

10.2.64. As set out in Chapter 2 of this ES, EIA Scoping is not a statutory requirement, when committing a scheme to EIA. The Applicant has not requested a formal Scoping Opinion in relation to the Proposed Development; however, has instead followed the scope of that agreed in relation to the larger, separate 'Toton North' scheme, which lies in proximity to the north-east of the Site. Given the primary reason for undertaking an EIA is in relation to the potential significant cumulative effects that could occur with Toton North (and other potential schemes), this is considered appropriate and robust.

10.2.65. **Table 10.1** provides an overview of the consultation that was undertaken to inform the Proposed Development and ES Chapter of the Toton West scheme, including the consideration of likely significant effects and the methodology for assessment. Further details of the correspondence with BBC are outlined within **Appendix 10.2**.

Table 10.1: Summary of Consultation

Consultee	Summary of consultation	Summary of Consultee Response
BBC Environmental Health	Hoare Lea provided BBC information regarding the assessment methodology, specifically the monitoring sites considered suitable for model verification for the baseline and future year assessments, where required. Response: Acceptance of the methodology was received by BBC. A copy of the correspondence with BBC is provided in **Appendix 10.2.**	No comments to be addressed as methodology was agreed.

10.2.66. The following effects are therefore considered to be not significant and are not considered further in this Chapter:

- Impacts to air quality at sensitive human and ecological receptors from non-road mobile machinery (NRMM) during the construction phase, since emissions of NO_X and PM_{10} will be required to adhere to emissions standards. Therefore, no significant effects are anticipated with regard to NRMM.

- Impacts to air quality from on-site combustion emissions during the operational phase since the energy strategy for the Proposed Development is anticipated to be all-electric, with no combustion sources likely to be utilised as the primary energy source. Therefore, no significant effects are anticipated with regard to the effects of energy plant emissions on nearby sensitive receptors.

- Impacts to air quality at sensitive ecological receptors from the emissions resulting from construction and operational phase traffic emissions. As confirmed by the Applicant's ecologist, given the location of the King Georges Park LNR and Bluebell Wood LWS already located within a highly urbanised area, existing levels of pollution will limit the quality of habitats interest. As levels of pollutants can be reasonably expected to exponentially decline with distance from the source, the location of the A52 at a minimum distance of 85m away, means that any impact from construction and operational traffic emissions would be negligible. Therefore, no significant effects are anticipated with regard to the effect of both construction and operational phase traffic emissions on ecological receptors.

- A qualitative Site Suitability Assessment (without modelling) will be undertaken as the baseline air quality conditions in the vicinity of the Site in 2023, as outlined in **Section 10.3**, demonstrate compliance and have significant headroom below the relevant annual mean, 1-hour mean and 24-hour mean AQOs for NO_2, PM_{10} and $PM_{2.5}$ in the vicinity of the Site. As such, the additional traffic associated with the operational phase of the Proposed Development is unlikely to increase the local NO_2, PM_{10} and $PM_{2.5}$ concentrations above their respective AQOs. Therefore, no significant effects are anticipated.

10.2.67. The Air Quality chapter considers the following potential effects that have the potential to cause significant effects:

- Impacts to air quality at sensitive human and ecological receptors due to fugitive dust emissions during the construction phase as appropriate mitigation measures will be implemented. A construction dust risk assessment has been undertaken within **Appendix 10.3**. With the appropriate mitigation measures in place, the effects of fugitive dust emissions during the construction phase are unlikely to be significant.

- Impacts to air quality at sensitive human receptors from the emissions resulting from construction phase traffic generation. All construction traffic movements are to be controlled by a CTMP (to be secured by condition) which will minimise the potential for significant effects arising from construction traffic emissions. As the EIA is progressed further, once more exact information on the construction vehicle movements and Proposed Development phasing becomes available, this will be reviewed and screened against the EPUK/ IAQM criteria to determine whether a detailed assessment is required to assess the potential effects of construction traffic emissions on air quality at existing sensitive human receptors.

- Impacts to air quality at sensitive human receptors as a result of the emissions from operational phase traffic generation.

Assessment of Significance

Construction Phase

10.2.68. The IAQM construction guidance states that the primary aim of the construction phase risk assessment is to identify site specific mitigation that, once implemented, should ensure that there will be no significant effect. Therefore, the assessment has been used to determine an appropriate level of mitigation for the construction phase.

10.2.69. The IAQM construction guidance assessment methodology recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. The reason for this is that for almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to existing sensitive human and ecological receptors and therefore the residual effect will normally be **Negligible**.

10.2.70. However, for the purposes of this ES, the risk of impact has been considered based on the potential dust emissions magnitude and the sensitivity of the area with no mitigation measures being in place to identify the relevant mitigation measures required. The significance of the impact is then determined with the inclusion of embedded mitigation measures identified. The criteria in **Appendix 10.3** have been used for defining the risk of the pre-mitigation impacts identified in this Chapter.

10.2.71. The risk of impact is established, on the worst-case area sensitivity and in the absence of mitigation, for each of the construction related activities (earthworks, construction and trackout). There will be four levels of risk impacts. These are classified as **High** which would be considered as a **Major** effect, **Medium** impacts which would be considered as **Moderate** effects, **Low** impacts which would be considered as a **Minor** effect and **Negligible** impacts which would be considered as a **Negligible** effect.

Operational Phase

10.2.72. The following approach will be followed for the operational road traffic impact assessment.

10.2.73. For this assessment, all receptors are considered to be sensitive as the effects of air quality are related to human health.

10.2.74. The magnitude of change has been considered as the change experienced from the 2030 DM concentrations to the 2030 DS concentrations, alongside from the 2030 DM concentrations to the 2030 IC-DS concentrations at existing sensitive receptor locations.

10.2.75. The approach in the EPUK/IAQM guidance has been used to describe the magnitude of impact at individual existing receptors. This is based on the percentage of change in concentration relative to the AQAL and with the total long-term average concentration with the Proposed Development, as shown in the below table. In this assessment the AQAL is the annual mean objective. For NO_2 and PM_{10} this is 40 µg/m^3 and for $PM_{2.5}$ this is 20 µg/m^3, with a 2040 annual mean $PM_{2.5}$ target of 10 µg/m^3 as outlined in the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[12] which applies as an AQAL here due to the Proposed Development anticipated opening year of 2041.

Table 10.3 Impact Descriptors for Individual Existing Receptors (EPUK/IAQM Guidance)

		% change in concentration relative to Air Quality Assessment Level (AQAL)			
		1	2-5	6-10	>10
Long-term average concentration at receptor in assessment	75% or less of AQAL	Negligible	Negligible	Slight	Moderate
	76-94% of AQAL	Negligible	Slight	Moderate	Moderate
	95-102% of AQAL	Slight	Moderate	Moderate	Substantial
	103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
	110% of AQAL	Moderate	Substantial	Substantial	Substantial

10.2.76. The impact descriptors outlined in **Table 10.3** have been used to define the significance of the effects identified and these can be 'beneficial' or 'adverse':

- **Substantial** or **Major** effect: where the Proposed Development is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity. This effect is considered to be '**Significant**';

- **Moderate** effect: where the Proposed Development is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability; or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability. This effect is considered more likely to be '**Significant**' but will be subject to professional judgement;

- **Minor** effect: where the Proposed Development is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Development is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change. This effect is considered less likely to be '**Significant**' but will be subject to professional judgement; and

- **Negligible**: where the Proposed Development is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change. This effect is '**Not Significant**'.

10.2.77. Where significant impacts are predicted, mitigation measures are recommended to reduce the impact.

10.2.78. The overall significance of the air quality impacts is judged as either significant or not significant taking account of:

- The existing and future air quality in the absence of the Proposed Development;
- The extent of current and future population exposure to the impacts; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

10.2.79. These factors were considered, and an overall significance determined for the impact of operational phase road traffic emissions. It should be noted that the determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

Limitations to the Assessment

10.2.80. The emission factors used are from Defra's most recent Emission Factor Toolkit (EFT) (v12.0.1), published in 2023. There remains some uncertainty regarding future NOx emissions but there is a growing body of evidence that shows that the most recent diesel vehicles have substantially lower NOx emissions than earlier generations, and this will be reflected in lower ambient concentrations of NO_2 in the future. As such, 2030 emission factors have been utilised for the operational phase detailed assessments to maintain a conservative assessment. Defra predicted background concentrations were also kept at 2030 for the DM, DS and IC-DS scenarios.

10.2.81. It has been assumed that DEFRA's NOx to NO_2 calculator (v.9.0) has accurately predicted NO_2 concentrations.

10.2.82. It has been assumed that weather conditions at Nottingham/Watnall meteorological station are similar to those in the vicinity of the Site, and that meteorological data for 2023 is representative of the conditions in 2030. The weather station lies approximately 10km to the north of the Site. There are no major physical features likely to have a significant impact on the weather conditions between the Nottingham/Watnall meteorological station and the Site and therefore using data from this weather station is considered acceptable. It is not possible to forecast future weather conditions with accuracy and therefore, assuming that weather conditions remain the same as now is a reasonable option.

10.2.83. It has been assumed that the background concentrations provided by both Defra background maps and the BBC passive diffusion tube monitoring locations for the year 2030 are representative of worst-case future year background concentrations.

10.2.84. To improve the modelling accuracy the air quality model results have been compared to measured air quality data and adjusted accordingly, using the model verification method

described in LAQM.TG(22)[17]. This ensures that the predicted concentrations in the baseline year are close to the measured data and any errors in the model predictions are reduced.

10.2.85. There is always some uncertainty regarding the prediction of air quality. This is associated with both the difficulty in simulating mathematically the complex atmospheric processes that affect pollutant concentrations and the uncertainties in the model input data. However, the professional judgement and experience of the consultants preparing this Air Quality ES Chapter has been used and the method for assessing air quality agreed to produce a robust assessment.

10.2.86. The existing sensitive human receptor locations identified in this assessment are considered to be worst-case locations in terms of sensitivity to poor air quality. This is not an exhaustive list and there may be other locations within the vicinity of the Site which may experience air quality impacts as a result of traffic generated by the Proposed Development that have not been individually assessed, however the sensitive receptor locations which have been assessed do present what is considered to be the worst-case scenario.

10.3. Baseline Conditions

Site Description and Context

10.3.1. The Site is not located within an AQMA and is approximately 3.4km southwest from the nearest AQMA, named 'AQMA No.2', which is located in the neighbouring Nottingham City Council's (NCC's) administrative area. This AQMA has been declared for exceedances of the annual mean NO_2 Air Quality Objective (AQO) only. There are currently no AQMAs declared within the BBC administrative area, with the BBC AQMA "Trowell" revoked on the 16th of January 2024 (declared in 2006 for exceedances of the NO_2 annual mean AQO).

10.3.2. The Site is located within BBC's administrative area. The Site is also located in close proximity to the administrative area of NCC and Erewash Borough Council (EBC).

Baseline Survey Information

Local Air Quality Monitoring

10.3.3. The automatic monitoring of pollutants NO_2, PM_{10} and $PM_{2.5}$ was undertaken by BBC at one site in 2023, through a Zephyr sensor (MCERTs certified), installed in 2022, located within the previous "Trowell" AQMA, approximately 3.3km north of the Site. Due to issues with the sensor throughout 2022, BBC did not report on the 2022 data in the 2023 Annual Status Report (ASR)[23] as it was deemed unreliable. However, it is noted that the issues were rectified, and the 2023 data (single year of monitoring data) at this Zephyr sensor was reported on for use in the latest BBC 2024 ASR[24].

10.3.4. BBC utilise passive diffusion tube monitoring locations to record annual mean NO_2 concentrations within their administrative areas. Monitoring data from passive diffusion tube monitoring locations within BBC administrative area in 2023 has been provided from the 2024 ASR[24].

10.3.5. The pollutant concentrations recorded in 2020 and 2021 are not considered to be representative of "normal" air quality conditions. Whilst it is expected that as a result of the

[23] Broxtowe Borough Council (2023) 2023 Air Quality Annual Status Report (ASR) for Broxtowe Borough Council
[24] Broxtowe Borough Council (2024) 2024 Air Quality Annual Status Report (ASR) for Broxtowe Borough Council

COVID-19 pandemic behaviours will change in the future, the impact of this on air quality long-term is currently unknown. Therefore, the use of 2020 and 2021 data will be omitted from any analysis but has been included for information. Monitoring data for 2023 is available for use as the latest year of representative monitoring data and as such will be considered as the baseline year, 2019 and 2022 monitoring data will be presented within this section for comparison.

10.3.6. The 2023 monitoring data from the automatic Zephyr sensor "Trowell Zephyr 932" operated by BBC has been provided from the BBC 2024 ASR, with the annual mean pollutant concentrations presented in **Table 10.5** below. The location of "Trowell Zephyr 932" is demonstrated in **Plate 10.1** below.

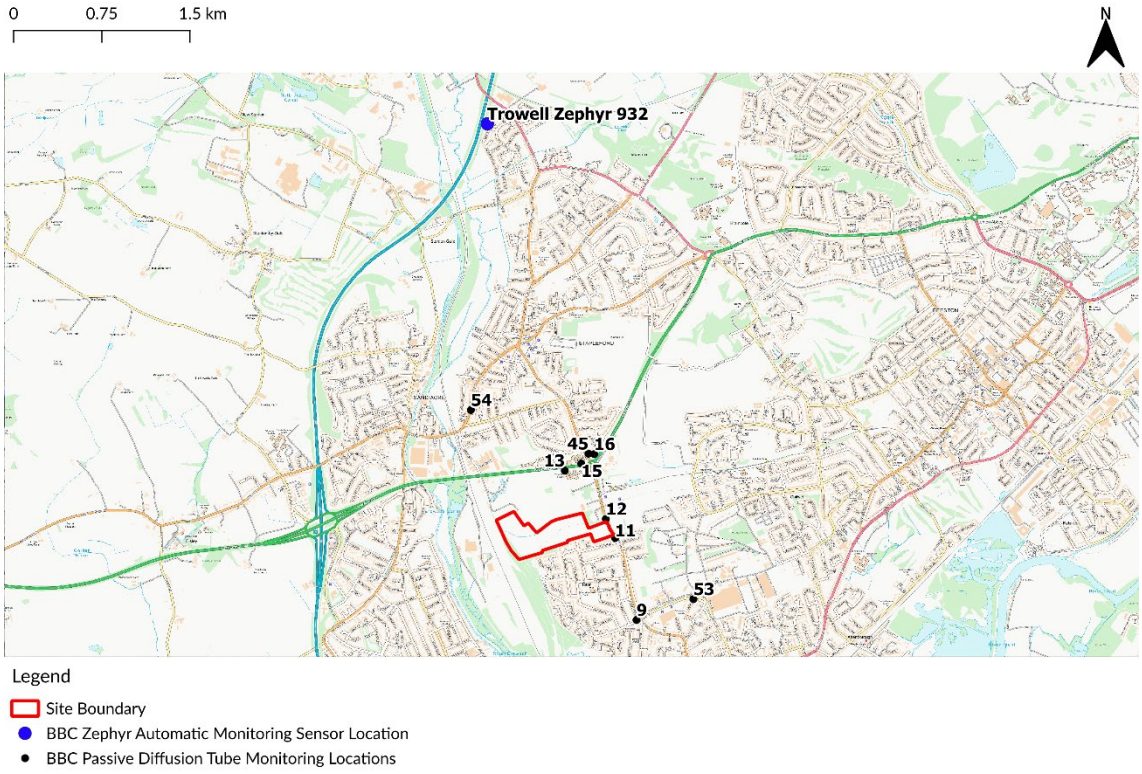

Plate 10.1 Location of the BBC Monitoring Stations in the vicinity of the Site. Contains OS Data © Crown Copyright and Database rights 2024

Table 10.5 Automatic Monitoring Data

Monitoring site and distance (km) from the Site boundary (approx.)	Objective	2023
NO_2		
Trowell Zephyr 932, 3.4km	Annual mean (µg/m^3)	15.6
	Number of hours with concentrations >200 µg/m^3	0
PM_{10}		
Trowell Zephyr 932 3.4km	Annual mean (µg/m^3)	12.3
	Number of days with concentrations > 50 µg/m^3	3
$PM_{2.5}$		
Trowell Zephyr 932, 3.4km	Annual mean (µg/m^3)	8.0

10.3.7. As shown in **Table 10.5**, in 2023, compliance with the annual mean AQOs for NO_2, PM_{10} and $PM_{2.5}$ was observed at this automatic Zephyr sensor 'Trowell Zephyr 932' located approximately 3.4km north of the Site. Furthermore, compliance with both the 1-hour mean NO_2 and 24-hour mean PM_{10} AQOs was also observed at this automatic sensor in 2023.

10.3.8. **Table 10.6** provides the recorded annual mean NO_2 concentrations at the nine nearest passive diffusion tube monitoring locations to the Site from the years 2019 to 2023. The locations of the ten passive diffusion tube monitoring locations are illustrated in **Plate 10.1.**

Table 10.6 Passive Diffusion Tube Monitoring Data (2019-2023)

Site ID	Site Type	Distance (m) from Site (approx.)	Annual Mean NO_2 Concentration (µg/m³)				
			2019	2020	2021	2022	2023
12	Roadside	25	20	17	19	19	17
11	Roadside	30	28	21	23	22	21
13	Roadside	385	25	18	20	19	17
15	Roadside	420	29	24	25	28	26
45	Roadside	510	27	20	21	21	19
16	Roadside	510	25	18	20	20	18
9	Roadside	750	22	16	18	17	15
53	Roadside	870	20	14	54	14	13
54	Roadside	940	30	22	24	22	21

Notes:

NO_2 concentrations have been rounded to the nearest whole number

10.3.9. As noted above, monitoring data for 2020 and 2021 has been included for information purposes only. There have been no exceedances of the annual mean NO_2 AQO of 40 µg/m³ at any of the passive diffusion tube monitoring locations within 1km of the Site in 2023, the most recent year of available monitoring data. The passive diffusion tube monitoring location with the highest concentration in 2023 was Site ID: 15, recording an annual mean NO_2 concentration of 26 µg/m³ or approximately 65% of the annual mean AQO. As such it is considered likely that no exceedances of the annual mean AQO will be experienced in the vicinity of the Site.

10.3.10. The 1-hour mean AQO for NO_2 is 200 µg/m³ and should not be exceeded more than 18 times within a year. In line with LAQM.TG(22)[17], an annual mean NO_2 concentration of 60 µg/m³ or above is often used to indicate a possible exceedance of the 1-hour mean NO_2 AQO. There has been no recorded exceedance of the 60 µg/m³ threshold at any of the passive diffusion tube monitoring locations within 1 km of the Site in the baseline year 2023. As such, no exceedance of the 1-hour mean NO_2 AQO is expected.

DEFRA Predicted Background Concentrations

10.3.11. The DEFRA predicted background concentrations[25] have been obtained from the national maps published by Defra. These estimated concentrations are produced on a 1km-by-1km grid basis for the whole of the UK. The Site falls into two grid squares. The minimum and maximum DEFRA predicted background concentrations[25] for the Site for pollutants NO_2, PM_{10} and $PM_{2.5}$ are provided in **Table 10.7** for 2023, the most recent year of available monitoring data.

10.3.12. As shown in **Table 10.7**, Defra predicted background concentrations[25] are below the relevant AQOs for all pollutants in 2023, the baseline year.

Table 10.7 Minimum and Maximum Defra Predicted Background Concentrations for 2023 in µg/m³.

Year	Minimum and Maximum Annual Mean Concentration (µg/m³)		
	NO_2	PM_{10}	$PM_{2.5}$
2023	11.1-11.6	13.3-13.6	7.6-7.8

Industrial Sources

10.3.13. A desk-based review of potential industrial sources using the Pollution Inventory from the Environment Agency[26] did not identify any significant industrial or waste management sources of air pollution within 2km of the Site that are likely to affect the Site with regard to air quality.

Future Baseline

10.3.14. The Defra predicted background concentrations for 2030, to represent future year baseline conditions in the vicinity of the Site.

10.3.15. As shown in **Table 10.8,** Defra predicted background concentrations[25] are below the relevant AQOs for all pollutants in 2030 and 2040, the closest available year to 2041, the earliest anticipated opening year of the Proposed Development. The 2040 Defra predicted background concentrations have been provided for information only as an indication of the air quality conditions anticipated at the Site in 2041. The 2030 Defra predicted background concentrations in the vicinity of the Site have been utilised in the assessment as a worst-case scenario of the air quality conditions anticipated at the Site.

[25] Defra (2024) Background Pollution Maps – 2021 – [online] available at: Background Mapping data for local authorities - 2021 - Defra, UK [Accessed: 28/01/2025]

[26] Environment Agency (2020) Pollution Inventory – [online], available at: Pollution Inventory - data.gov.uk [Accessed: 28/01/2025].

Table 10.8 Minimum and Maximum Defra Predicted Background Concentrations for 2030 and 2040 in µg/m³

Year	Minimum and Maximum Annual Mean Concentration (µg/m³)		
	NO_2	PM_{10}	$PM_{2.5}$
2030	8.8-9.1	12.8-13.0	7.1-7.3
2040	7.5-7.7	12.2-12.4	6.5-6.6

10.4. Assessment of Likely Significant Effects

Construction

Construction Dust Emissions

10.4.1. An assessment of construction dust risk has been undertaken and is provided within **Appendix 10.3**.

10.4.2. As outlined within **Appendix 10.3**, it is considered that due to the size and proximity of the nearby sensitive receptors that the highest risk of impact, 'high risk', has been applied to the Site in line with the IAQM guidance. Therefore, associated high risk mitigation measures should be implemented.

10.4.3. A list of the high-risk mitigation measures to be implemented and included as part of a CEMP to minimise dust emission during the construction phase and control impacts to a **negligible** level are outlined within **Appendix 10.3**. On that basis, there are expected to be no likely significant effects to air quality at existing sensitive receptors.

Construction Traffic Emissions

10.4.4. The impacts of vehicle emissions (NO_2, PM_{10} and $PM_{2.5}$) associated with the construction phase of the Proposed Development have the potential to affect existing sensitive receptors located at the roadside of the proposed construction routes.

10.4.5. The construction traffic flows are expected to fall below the EPUK/IAQM criteria, with all construction vehicle movements to be controlled by a CTMP and CEMP and therefore the impact on existing sensitive human receptors will be **negligible**; no significant effects are anticipated.

10.4.6. As all vehicle movements during the construction phase are to be controlled by a CTMP, the potential for air quality impacts from construction traffic emissions are inherently reduced. As such, the effect to air quality at existing sensitive human and ecological receptors from construction traffic emissions will be minimised through implementation of the CTMP.

Operation

Operational Traffic Emissions

10.4.7. Pollutant concentrations for NO_2, PM_{10} and $PM_{2.5}$ have been modelled at existing sensitive receptor locations in the vicinity of the roads anticipated to be used by traffic associated with the operation of the Proposed Development (DS scenario).

10.4.8. Modelling inputs for the impacts of operational phase traffic assessment are presented in **Appendix 10.4**.

NO_2

10.4.9. The predicted annual mean NO_2 concentrations are provided in **Table A10.17** in **Appendix 10.5** for the 2030 DM and 2030 DS scenarios. The results of the assessment are discussed below.

Long term Objective

10.4.10. Predicted annual mean NO_2 concentrations are not predicted to exceed the AQAL of 40 µg/m^3 at any of the existing sensitive human receptors where the annual mean objective applies in either of the DM or DS scenarios.

10.4.11. In the DS scenario, the greatest increase in NO_2 concentration occurred at the eight sensitive receptors R1, R2, R5, R10, R18, R24, R30 and R32 (**see Figure 10.1**). The modelled annual mean NO_2 concentration increase in the DS scenario at these receptors was 0.1 µg/m^3 or 0.2% of the AQO. The maximum annual mean NO_2 concentration predicted at these receptors in the DS scenario was 15.7 µg/m^3 at R10, which represents 39.3% of the AQO. As such, the change in concentration at this receptor is considered **'Negligible'** in line with EPUK and IAQM guidance.

10.4.12. The maximum NO_2 concentration predicted in the DS scenario is 15.8 µg/m^3 at receptor R14, which represents 39.4% of the AQO. Therefore, the annual mean NO_2 concentrations predicted at all other existing sensitive human receptors also fall below the annual mean AQO in the DS scenario.

10.4.13. The greatest increase in NO_2 concentration at receptors R1, R2, R5, R10, R18, R24, R30 and R32 was considered '**Negligible**' in line with EPUK and IAQM guidance and therefore no significant effects are anticipated. Therefore, the impacts on NO_2 concentrations at all other existing sensitive receptors in the DS scenario compared to the DM scenario are also considered '**Negligible**' in line with EPUK and IAQM guidance and are deemed **Not Significant**.

Short term Objective

10.4.14. The annual mean NO_2 concentrations predicted at all existing sensitive receptors in the DM and DS scenarios are below the 60 µg/m^3 trigger level outlined in LAQM.TG(22)[17] to indicate potential exceedance of the 1-hour mean NO_2 AQO. As such, it is considered unlikely that the 1-hour mean NO_2 objective will be exceeded at any of the existing sensitive human receptors considered in this assessment.

PM_{10}

10.4.15. The predicted annual mean PM_{10} concentrations are provided in **Table A10.18** in **Appendix 10.5** for the 2030 DM and 2030 DS scenarios. The results of the assessment are discussed below.

Long term Objective

10.4.16. Predicted annual mean PM_{10} concentrations are not predicted to exceed the AQAL of 40 µg/m^3 at any of the existing sensitive human receptors where the annual mean objective applies in both the DM and DS scenarios.

10.4.17. In the DS scenario, the greatest increase in PM_{10} concentration occurred at the three sensitive receptors R1, R24 and R32. The modelled annual mean PM_{10} concentration increase in the DS scenario at these receptors was 0.1 µg/m^3 or 0.2% of the AQO. The maximum annual mean PM_{10} concentration predicted at these receptors was 18.1 µg/m^3 at R1, which represents 45.2% of the annual mean PM_{10} AQO. As such, the change in concentration at these receptors is considered '**Negligible'** in line with EPUK and IAQM guidance.

10.4.18. As mentioned previously, the maximum annual mean PM_{10} concentration in the DS scenario was predicted to occur at receptor R1, equivalent to 45.2% of the annual mean PM_{10} AQO. Therefore, the annual mean PM_{10} concentrations predicted at all other existing sensitive receptors also fall below the annual mean AQO in the DS scenario.

10.4.19. In the DS scenario, the greatest increase in PM_{10} concentration at receptors R1, R24 and R32 was considered '**Negligible**' in line with EPUK and IAQM guidance and therefore no significant effects are anticipated. Therefore, the impacts on PM_{10} concentrations at all other existing sensitive receptors in the DS scenario compared to the DM scenario are also considered '**Negligible**' in line with EPUK and IAQM guidance and are deemed **Not Significant**.

Short term Objective

10.4.20. As outlined in **Paragraph 10.2.41** the relationship in LAQM.TG(22)[17] has been used to indicate potential exceedance of the short term 24-hour mean PM_{10} AQO.

10.4.21. Utilising the above relationship with the maximum annual mean PM_{10} concentration predicted in the DS scenario of 18.1 µg/m^3 at receptor R1 indicates that one exceedance of the 24-hour mean PM_{10} AQO is possible at the receptor R1.

10.4.22. As such, since only a single exceedance of the 24-hour mean PM_{10} AQO was predicted at receptor R1, which falls below the maximum 18 days of exceedance to indicate compliance with the 24-hour mean PM_{10} AQO.

10.4.23. As outlined in Paragraph 10.4.18, the predicted annual mean PM_{10} concentrations were all below that predicted at R1. As such, compliance with the 24-hour mean PM_{10} AQO was predicted at all existing sensitive human receptors in the vicinity of the Site in the DS scenario.

$PM_{2.5}$

10.4.24. The predicted annual mean $PM_{2.5}$ concentrations are provided in **Table A10.19** in **Appendix 10.5** for the 2030 DM and 2030 DS scenarios. The results of the assessment are discussed below.

Long term Objective

10.4.25. Predicted annual mean $PM_{2.5}$ concentrations are not predicted to exceed the AQAL of 20 µg/m^3 at any of the existing sensitive receptors where the annual mean objective applies in both the DM and DS scenarios.

10.4.26. In addition, as the Proposed Development opening year is 2041, the annual mean $PM_{2.5}$ target of 10 µg/m^3 to be met by 2040 outlined in *The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023*[12] has also been considered. In both the DM and DS scenarios, no exceedances of the annual mean PM_{10} target of 10 µg/m^3 (to be met by 2040) were predicted at any of the existing sensitive receptors in the vicinity of the Site.

10.4.27. In the DS scenario, the greatest increase in $PM_{2.5}$ concentration occurred at the three sensitive receptors R1, R24 and R32. The modelled annual mean NO_2 concentration increase in the DS scenario at this receptor was <0.1 µg/m^3 or 0.2% of the AQO. The maximum annual mean PM_{10} concentration at these receptors in the DS scenario was predicted to be 9.6 µg/m^3, which represents 48.1% of the annual mean $PM_{2.5}$ AQO, with 4.0% headroom below the annual mean 2040 $PM_{2.5}$ target[12]. As such, the change in concentration at this receptor is considered '**Negligible'** in line with EPUK and IAQM guidance.

10.4.28. The maximum $PM_{2.5}$ concentration predicted in the DS scenario is 9.6 µg/m^3 at receptor R1, equivalent to 48.1% of the annual mean $PM_{2.5}$ AQO, with 4.0% headroom below the annual mean $PM_{2.5}$ target of 10 µg/m^3 to be met by 2040[12]. Therefore, the annual mean $PM_{2.5}$ concentrations predicted at all other existing sensitive receptors also fall below the annual mean AQO in the DS scenario.

10.4.29. As outlined in Paragraph 10.4.27, the greatest increase in $PM_{2.5}$ concentration at receptors R1, R24 and R32 was considered '**Negligible**' in line with EPUK and IAQM guidance and therefore **Not Significant**. Therefore, the impacts on $PM_{2.5}$ concentrations at all other existing sensitive receptors in the DS scenario compared to the DM scenario are also considered '**Negligible**' in line with EPUK and IAQM guidance and are deemed **Not Significant**.

10.5. Mitigation, Enhancement and Residual Effects

Mitigation by Design

10.5.1. Although no mitigation is required for the operational phase transport impacts, a Travel Plan will be included which will further reduce the impact of traffic on air quality.

10.5.2. A Construction Traffic Management Plan (CTMP) and CEMP will be used to control activity during the construction phase, and secured by condition, and as such, emissions to air will be mitigated. A list of mitigation measures to be implemented and included as part of a CEMP to minimise dust emission during the construction phase and control impacts to a negligible level are outlined in **Appendix 10.3.**

Additional Mitigation.

10.5.3. Mitigation measures for the potential impacts during the construction phase from on-site activities and trackout are provided in the CEMP for the Site (to be secured by condition, please see **Chapter 4 'The Proposed Development' for further details**) and are in line with best practice management approaches, as recommended in **Appendix 10.3**. Mitigation measures recommended in **Appendix 10.3** were selected and are recommended to be incorporated into the CEMP based on the risk identified in **Table A10.9** in **Appendix 10.3**. With the mitigation considered in this assessment, no significant effects are likely to arise and therefore no further or additional mitigation is required.

10.5.4. It was determined from the results of the detailed dispersion modelling that the air quality impacts associated with the trip generation during the operational phase of the Proposed

Development are predicted to be '**Negligible**' at all modelled existing sensitive receptors. No significant effects are anticipated and no additional mitigation is required.

Table 10.9: Mitigation

Ref	Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects	How measure would be secured		
		By Design	By S.106	By Condition
1	Dust measures within a Dust Management Plan (potentially part of CEMP, to be secured by condition)	X		X
2	Travel Plan		X	X

Enhancements.

10.5.5. As no significant effects have been identified, no enhancements are required for the Proposed Development.

Residual Effects

Construction

10.5.6. The measures implemented via the CTMP and CEMP for the Proposed Development, to be secured by condition, are considered sufficient to minimise impacts to air quality from emissions associated with construction traffic and NRMM residual effects with regard to air quality.

Operation

10.5.7. There is considered to be no significant residual effects pertaining to increased NO_2, PM_{10} or $PM_{2.5}$ concentrations as a result of operational road traffic emissions on existing sensitive receptors in the vicinity of Proposed Development.

10.6. Cumulative and In-Combination Effects

10.6.1. A total of nine developments have been identified as cumulative schemes and outlined in **Table 2.5** of **Chapter 2: Assessment Scope and Methodology**. The potential for cumulative effect associated with six of these schemes (Site of the Magpie, Bramcote College, Field Farm Ilkeston, Land Adjacent of North West of Bramcote Crematorium, Land East of Coventry Lane and the Former Stanton Ironworks Site) has been discounted due to their locations being at a distance too far from the Site. Therefore, due to the location and separating distance of these six developments from the Site, potential significant cumulative effects are unlikely.

10.6.2. The three cumulative schemes that have been considered further for cumulative effects of the construction stage are 'Land at Toton East', 'Land at Toton North' and Southfields Farm BESS facility. Due to the nature of the Southfields Farm BESS facility, there are to be very minimal traffic flows associated with the operation of the Southfields Farm BESS facility and so the consideration of operational traffic associated with Southfields Farm have been discounted from the assessment, with only the two cumulative schemes of 'Land at Toton East' and 'Land at Toton North' considered in the cumulative effect of operation.

Construction

10.6.3. With the implementation of mitigation measures within their respective applications, it is anticipated that there would be no likely significant effects due to construction traffic emissions, dust or NRMM emission at local receptors.

10.6.4. Individual construction movements associated with the Proposed Development and cumulative schemes of 'Land at Toton East', 'Land at Toton North' and Southfields Farm BESS facility are to be controlled by the implementation of individual CTMPs for each scheme, to minimise impacts to air quality from emissions associated with construction traffic and NRMM residual effects with regard to air quality. As such it is considered that, the effects to air quality from NRMM and construction traffic emissions are to be insignificant.

10.6.5. It is not considered likely that there will be any cumulative effects from construction traffic associated with the Proposed Development and other developments located within the local area due to the implementation of relevant mitigation measures and management plans within their respective applications.

Operation

10.6.6. To consider the potential for any cumulative effects from operational traffic associated with the Proposed Development and other developments located within the local area, the IC-DS scenario considered the combination of operational flows of the Proposed Development alongside those of the cumulative schemes 'Land at Toton East' and 'Land at Toton North'. Due to the nature of the Southfields Farm BESS facility, there are to be very minimal traffic flows associated with the operation of the Southfields Farm BESS facility and so the consideration of operational traffic associated with Southfields Farm have been discounted from the assessment.

NO_2

10.6.7. The predicted annual mean NO_2 concentrations are provided in **Table A10.20 in Appendix 10.6** for the 2030 DM and 2030 IC-DS scenario. The results of the assessment are discussed below.

Long term Objective

10.6.8. In the IC-DS scenario, the greatest increase in NO_2 concentration occurred at R32. The modelled annual mean NO_2 concentration increase in the DS scenario at this receptor was 0.3 µg/m^3 or 0.8% of the AQO. The total annual mean NO_2 concentration at R32 was 13.4 µg/m^3, which represents 33.6% of the AQO. As such, the change in concentration at this receptor is considered '**Negligible'** in line with EPUK and IAQM guidance.

10.6.9. The maximum NO_2 concentration predicted in the IC-DS scenario is 15.9 µg/m^3 at receptors R10 and R14, which represents 39.8% of the annual mean NO_2 AQO. Therefore, the annual mean NO_2 concentrations predicted at all other existing sensitive receptors also fall below the annual mean AQO in the IC-DS scenario.

10.6.10. As outlined in Paragraph 10.6.8, the greatest increase in NO_2 concentration at receptor R32 in the IC-DS scenario was considered '**Negligible**' in line with EPUK and IAQM guidance and therefore **Not Significant**. Therefore, the impacts on NO_2 concentrations at all other existing sensitive receptors in the IC-DS scenario compared to the DM scenario are also considered '**Negligible**' in line with EPUK and IAQM guidance and are therefore deemed **Not Significant**.

Short term Objective

10.6.11. The annual mean NO_2 concentrations predicted at all existing sensitive receptors in the DM and IC-DS scenarios are below the 60 µg/m^3 trigger level outlined in LAQM.TG(22)[17] to indicate potential exceedance of the 1-hour mean NO_2 AQO. As such, it is considered unlikely that the 1-hour mean NO_2 objective will be exceeded at any of the existing sensitive human receptors considered in this assessment.

PM_{10}

10.6.12. The predicted annual mean PM_{10} concentrations are provided in **Table A10.21 in Appendix 10.6** for the 2030 DM and 2030 IC-DS scenarios. The results of the assessment are discussed below.

Long term Objective

10.6.13. In the IC-DS scenario, the greatest increase in PM_{10} concentration occurred at R32. The modelled annual mean PM_{10} concentration increase in the DS scenario at this receptor was 0.2 µg/m^3 or 0.6% of the AQO. As such, the change in concentration at this receptor is considered '**Negligible'** in line with EPUK and IAQM guidance.

10.6.14. The maximum PM_{10} concentration predicted in the IC-DS scenario is 18.2 µg/m^3 at receptor R1, equivalent to 45.6% of the annual mean PM_{10} AQO. Therefore, the annual mean PM_{10} concentrations predicted at all other existing sensitive receptors also fall below the annual mean AQO in the IC-DS scenario.

10.6.15. As outlined in Paragraph 10.6.13, the greatest increase in PM_{10} concentration at receptor R32 in the IC-DS scenario was considered **'Negligible**' in line with EPUK and IAQM guidance and therefore **Not Significant**. Therefore, the impacts on PM_{10} concentrations at all other existing sensitive receptors in the IC-DS scenario compared to the DM scenario are also considered '**Negligibl**e' in line with EPUK and IAQM guidance and are therefore deemed **Not Significant**.

Short term Objective

10.6.16. As outlined in **Paragraph10.2.41**, the relationship in LAQM.TG(22)[17] has been used to indicate potential exceedance of the short term 24-hour mean PM_{10} AQO.

10.6.17. Utilising the above relationship with the maximum annual mean PM_{10} concentration predicted in the IC-DS scenario of 18.2 µg/m^3 at receptor R1, indicates that two exceedances of the 24-hour mean PM_{10} AQO were predicted at receptor R1.

10.6.18. As such, since only two exceedances of the 24-hour mean PM_{10} AQO were predicted at receptor R1, which falls below the maximum 18 days of exceedance to indicate compliance with the 24-hour mean PM_{10} AQO.

10.6.19. As outlined in Paragraph 10.6.14, the predicted annual mean PM_{10} concentrations at all other existing sensitive receptors were below those predicted at R1. As such, compliance with the 24-hour mean PM_{10} AQO was predicted at all existing sensitive human receptors in the vicinity of the Site in the IC-DS scenario.

$PM_{2.5}$

10.6.20. The predicted annual mean $PM_{2.5}$ concentrations are provided in **Table A10.22** in **Appendix 10.6** for the 2030 IC-DS scenario. The results of the assessment are discussed below.

Long term Objective

10.6.21. Predicted annual mean $PM_{2.5}$ concentrations are not predicted to exceed the AQAL of 20 µg/m^3 at any of the existing sensitive receptors where the annual mean objective applies in the IC-DS scenario.

10.6.22. In addition, no exceedances of the annual mean PM_{10} target of 10 µg/m^3 to be met by 2040, outlined in *The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023*[12], were predicted at any of the existing sensitive receptors in the vicinity of the Site in the IC-DS scenario.

10.6.23. In the IC-DS scenario, the greatest increase in $PM_{2.5}$ concentration occurred at receptors R1, R24 and R32. The modelled annual mean $PM_{2.5}$ concentration increase in the DS scenario at these receptors was 0.1 µg/m^3 or 0.6% of the AQO. The maximum annual mean $PM_{2.5}$ concentration in the IC-DS scenario was predicted to be 9.7 µg/m^3 at receptor R1, which represents 48.5%,of the annual mean $PM_{2.5}$ AQO, with 3.0% headroom below the annual mean 2040[12] $PM_{2.5}$ target of 10 µg/m^3. As such, the change in concentration at these receptors is considered '**Negligible'** in line with EPUK and IAQM guidance.

10.6.24. As mentioned preciously, the maximum $PM_{2.5}$ concentration predicted in the IC-DS scenario is 9.7 µg/m^3 at receptor R1, equivalent to 48.5% of the annual mean $PM_{2.5}$ AQO, with 3.0% headroom below the annual mean $PM_{2.5}$ target of 10 µg/m^3 to be met by 2040[12]. Therefore, the annual mean $PM_{2.5}$ concentrations predicted at all other existing sensitive receptors also fall below the annual mean AQO and 2040 target[12] in the IC-DS scenario.

10.6.25. As outlined in **Paragraph 10.6.23**, the greatest increase in $PM_{2.5}$ concentration at receptor R32 in the IC-DS scenario was considered '**Negligible'** in line with EPUK and IAQM guidance and therefore **Not Significant**. Therefore, the impacts on $PM_{2.5}$ concentrations at all other existing sensitive receptors in the IC-DS scenario compared to the DM scenario are also considered '**Negligible**' in line with EPUK and IAQM guidance and are therefore deemed **Not Significant**.

10.7. Summary

Introduction

10.7.1. This assessment has considered the impacts of the Proposed Development on local air quality in terms of dust and particulate matter emissions during construction and emissions from road traffic generated by the operational phase.

Baseline Conditions

10.7.2. The Site is not located within an AQMA and is approximately 3.4km southwest from the nearest AQMA, named 'AQMA No.2', which is located in the neighbouring Nottingham City Council's (NCC's) administrative area.

10.7.3. Monitored concentrations in the vicinity of the Proposed Development show pollutant concentrations have been below the AQOs in 2023, the most recently available year of monitoring data.

Likely Significant Effects

Construction Phase

10.7.4. It has been predicted that the construction traffic flows will fall below the EPUK/IAQM screening criteria. It is to note that all construction phase traffic movements are to be controlled via the CTMP for the Proposed Development. As such, the residual effect for construction traffic emissions can be considered **Negligible** and therefore, **Not Significant**.

10.7.5. A qualitative assessment of the potential dust soiling and PM_{10} effects to human health and ecological receptors as a result of the construction activities during the construction phase has been carried out. The unmitigated risk was determined to be high risk, in line with the IAQM guidance[20]. With the implementation of suitable mitigation measures included within the CEMP, to be secured by condition, and good site practice, the impacts from construction dust can be controlled and the residual effect for construction activities can be considered **Negligible** and therefore, **Not Significant**.

Operational Phase

10.7.6. The assessment has also demonstrated that pollutant concentrations will be well below the objectives at all existing receptors in 2030, which serves as a worst-case assumption of the Proposed Development opening year in 2041. The results from the detailed assessment of operational transport emissions (the percentage change in pollutant concentrations predicted at existing sensitive human receptors in the DS and IC-DS scenarios compared to the DM scenario), show that the impact on all existing sensitive receptors is anticipated to be **Negligible** for all pollutants, and therefore **Not Significant.**

Mitigation and Enhancement

10.7.7. Construction phase emissions to air will be controlled by a CEMP and CTMP, to be secured by condition.

Cumulative and In-Combination Effects

10.7.8. There are not expected to be any significant cumulative and in combination effects from the construction or operational phases when considering the cumulative schemes of 'Land at Toton East', 'Land at Toton North' (operational and construction phase) and the Southfields Farm BESS facility (construction phase only; the operational phase hasn't been assessed due to the nature of the Southfields Farm BESS scheme).

Construction Phase

10.7.9. With the implementation of mitigation measures within their respective applications, it is anticipated that there would be no likely significant effects due to construction traffic emissions, dust or NRMM emission at local receptors.

10.7.10. Individual construction movements associated with the Proposed Development and cumulative schemes of 'Land at Toton East', 'Land at Toton North' and Southfields Farm BESS facility are to be controlled by the implementation of individual CTMPs for each scheme, to minimise impacts to air quality from emissions associated with construction traffic and NRMM residual effects with regard to air quality. As such it is considered that, the cumulative impacts and in-combination effects to air quality from NRMM and construction traffic emissions are to be insignificant.

Operational Phase

10.7.11. The assessment has also demonstrated that pollutant concentrations will be well below the objectives at all existing receptors in 2030. As a worst-case assumption, despite only the 'scoped in cumulative site' 'Land at Toton East' being intended to be operational in the future year of 2030, the operational traffic flows on the local road network associated with the Proposed Development and the other 'scoped in cumulative site' of 'Land at Toton North' (with anticipated opening years of 2041) have also been included in the 2030 IC-DS scenario, to provide a robust and worst-case cumulative assessment.

10.7.12. The results from the detailed assessment of operational transport emissions (the percentage change in pollutant concentrations predicted at existing sensitive human receptors in the IC-DS scenario compared to the DM scenario), show that the impact on all existing sensitive receptors is anticipated to be **Negligible** for all pollutants, and therefore **Not Significant.**

Conclusion

10.7.13. The overall construction and operational air quality effects of the Proposed Development are judged to be '**Not Significant'**. It is concluded that the proposed package of mitigation will ensure that the Proposed Development is acceptable and that there will be no adverse significant effects to air quality.

10.7.14. **Table 10.10** provides a summary of effects, mitigation and residual effects.

Table 10.10: Summary of Effects, Mitigation and Residual Effects

Receptor / Receiving Environment	Description of Effect	Nature of Effect *	Sensitivity Value**	Magnitude of Effect**	Geographical Importance ***	Significance of Effects ****	Mitigation / Enhancement Measures	Residual Effects ****
Construction								
Existing residential and commercial receptors	Dust Emissions	Temporary direct	High	Large	Local	Negligible impact and therefore **Not Significant** with Mitigation by design implemented	n/a	Negligible **(not significant)**
Operation								
Existing residential and commercial receptors	Changes to concentrations of NO_2 and PM_{10} and $PM_{2.5}$	Permanent Direct	High	Negligible	Local	Negligible impact and therefore **Not Significant**	n/a	Negligible **(not significant)**
Cumulative and In-Combination								
Existing and committed residential receptors	Changes to concentrations of NO_2 and PM_{10} and $PM_{2.5}$	Permanent Direct	High	Negligible	Local	Negligible impact and therefore **Not Significant**	n/a	Negligible **(not significant)**