Rosefield Solar Farm

Environmental Statement

Volume 4
Appendix 6.1: Air Quality Assessment

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning
(Applications: Prescribed Forms
and Procedure) Regulations 2009

EN010158/APP/6.4
September 2025
Rosefield Energyfarm Limited

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1. Introduction

1.1. Purpose of the Report

1.1.1. This assessment presents the likely significant effects arising from the construction, operation (including maintenance), and decommissioning of the Rosefield Solar Farm (herein the 'Proposed Development') upon air quality. An air quality Environmental Statement (ES) chapter (**ES Volume 2, Chapter 6: Air Quality [EN010158/APP/6.2]**) has been prepared based on this assessment. The full description of the Proposed Development is provided within **ES Volume 1, Chapter 3: Proposed Development Description [EN010158/APP/6.1]**.

1.2. The Order Limits

1.2.1. The extent of the Order Limits are shown in **Location, Order Limits and Grid Coordinate Plans [EN010158/APP/2.1]** and the Proposed Development is described in full in **ES Volume 1, Chapter 3: Proposed Development Description [EN010158/APP/6.1]** and shown spatially on the **Works Plans [EN010158/APP/2.3].**

1.3. The Proposed Development

1.3.1. The Proposed Development comprises the construction, operation (including maintenance), and decommissioning of solar photovoltaic ('PV') development and energy storage, together with associated infrastructure and an underground cable connection to the National Grid East Claydon Substation.

1.3.2. The Proposed Development would include a generating station with a total exporting capacity exceeding 50 megawatts ('MW').

1.3.3. The location of the Proposed Development is shown on **ES Volume 3, Figure 1.1: Location Plan [EN010158/APP/6.3]**. The Proposed Development would be located within the Order Limits (the land shown on the **Works Plans [EN010158/APP/2.3]** within which the Proposed Development can be carried out). The Order Limits plan is provided as **ES Volume 3, Figure 1.2: Order Limits [EN010158/APP/6.3]**. Land within the Order Limits is known as the 'Site'.

1.3.4. The Proposed Development is described in Schedule 1 of the **Draft Development Consent Order (DCO) [EN010158/APP/3.1]** where the "authorised development" is divided into works packages. The works numbers for those packages are identified below and referred to throughout this assessment. Note that there is overlap of Work Areas in

some locations and so the sum of the Order Limits is not the total of these areas:

- Work No. 1: Ground Mounted Solar PV Generating Station
- Work No. 2: Rosefield Substation Compound
  - Work No. 2A: Rosefield Substation Compound
  - Work No. 2B: Abnormal Indivisible Load Corridor
- Work No. 3: Satellite Collector Compounds
  - Work No. 3A: Satellite Collector Compounds
  - Work No. 3B: Satellite Collector Compound Transformer
- Work No. 4: Battery Energy Storage System Compound
- Work No. 5: Main Collector Compound
- Work No. 6: Grid Connection Cabling Corridor
- Work No. 7: Interconnecting Cabling Corridor(s)
- Work No. 8: Temporary Construction and Decommissioning Compounds
  - Work No. 8A: Primary Construction Compounds; and
  - Work No. 8B: Secondary Construction Compounds
- Work No. 9: Highways Works (Facilitate access)
- Work No. 10: Green and Blue Infrastructure

1.3.5. The **Draft Development Consent Order (DCO) [EN010158/APP/3.1]** also allows for the following works to occur in connection with and in addition to the Work Nos. set out above within the Order Limits for those work areas. This has been considered within the assessments undertaken in this ES:

- Fencing, gates, boundary treatment and other means of enclosure;
- Bunds, embankments, trenching and swales;
- Works to the existing irrigation system(s) and works to alter the position and extent of such irrigation system(s);
- Rain or grey water harvesting and recycling systems;
- Roof top solar panels;
- Surface water drainage systems, storm water attenuation systems including storage basins, oil water separators, including channelling and culverting and works to existing drainage networks;

- Electrical, gas, water, foul water drainage and telecommunications infrastructure connections, diversions and works to, and works to alter the position of, such services and utilities connections;
- Works to alter the course of, or otherwise interfere with, non-navigable rivers, streams or watercourses;
- Works for the provision of security and monitoring measures such as CCTV columns and CCTV, security cabins, lighting columns and lighting and weather stations;
- improvement, maintenance, repair and use of existing streets, private tracks and access roads;
- Laying down, maintenance and repair of new internal access tracks, ramps, means of access, permissive footpaths and roads, crossings of drainage ditches and watercourses, including signage and information boards;
- Temporary and permanent public right of way diversions and closures and new and/or improvements to infrastructure (e.g. Gates and stiles) along temporarily or permanently diverted public rights or way footpaths;
- Landscaping and biodiversity mitigation and enhancement measures including planting;
- Tunnelling, boring and drilling works;
- Earthworks, site establishments and preparation works including site clearance (including vegetation removal); earthworks (including soil stripping and storage and site levelling) and excavations; the alteration of the position of services and utilities; and works for the protection of buildings and land; and
- Other works to mitigate any adverse effects of the construction, maintenance, operation or decommissioning of the authorised development.

2. Legislation Framework, Planning Policy and Guidance

2.1. Legislation

Air Quality Standards

2.1.1. The Air Quality Standards in the UK are derived from European Commission directives and are adopted into English law via the Air Quality (England) Regulations 2000 **[Ref. 1]** and Air Quality (England) Amendment Regulations 2002 **[Ref. 2]**. The Air Quality Limit Values Regulations 2003 **[Ref. 3]** and subsequent amendments implement the Air Quality Framework Directive into English Law. Directive 2008/50/EC **[Ref. 4]** was translated into UK law in 2010 via the Air Quality Standards Regulations 2010 **[Ref. 5]**. The Air Quality Standards Regulations 2016 [**Ref. 6**] amend the Air Quality Standards Regulations 2010 **[Ref. 5]** in 2016.

2.1.2. The relevant air quality standards to England and Wales to protect human health are summarised in **Table 2.1**.

Table 2.1: Air quality standards relevant to the Proposed Development

Substance	Averaging period	Exceedances allowed per year	Ground level concentration limit ($\mu g/m^3$)
Nitrogen dioxide (NO_2)	1 calendar year	-	40
	1 hour	18	200
Fine particles (PM_{10})	1 calendar year	-	40
	24 hours	35	50
Fine particles ($PM_{2.5}$)	1 calendar year	-	20

The Environmental Act 1995

2.1.3. These objectives are to be used in the review and assessment of air quality by local authorities under Section 82 of the Environment Act 1995 **[Ref. 7]**. If exceedances are measured or predicted through the review and assessment process, the local authority must declare an Air Quality Management Area (AQMA) under Section 83 of the Act and must produce an Air Quality Action Plan to outline how air quality is to be improved.

The Environmental Act 2021

2.1.4. The Environment Act 2021 **[Ref. 8]** amends the Environment Act 1995 **[Ref.1]** to establish the use of local air quality management frameworks in order to encourage cooperation at the local level and broaden the range of organisations that play a role in improving local air quality. Part 1 of The Environment Act requires targets to be set for fine particulate matter PM2.5, and these were introduced in The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 **[Ref. 9]**, as follows:

- $PM_{2.5}$ concentration interim target, annual mean of 12µg/m^3 by 2028;
- $PM_{2.5}$ exposure reduction interim target of 22% reduction compared to 2018 by 2028;
- $PM_{2.5}$ concentration binding target of annual mean of 10µg/m^3 by 2040;
- $PM_{2.5}$ exposure reduction binding target of 35% reduction compared to 2018 by 2040.

2.2. Planning Policy

2.2.1. The land use planning process is a key means of improving air quality, particularly in the long term, through the strategic location and design of new developments. Any air quality concern that relates to land use and its development can, depending on the details of the Proposed Development, be a material consideration in the determination of planning applications.

Overarching National Policy Statement for Energy (NPS EN-1)

2.2.2. Section 5.2 of NPS EN-1 **[Ref. 10]** details the planning policy for air quality, including guidance on undertaking the Environmental Impact Assessment (EIA).

2.2.3. Paragraph 5.2.8 states that: "*Where the project is likely to have adverse effects on air quality the applicant should undertake an assessment of the impacts of the proposed project as part of the ES*."

2.2.4. Paragraph 5.2.9 states that: "*The ES should describe:*

- *existing air quality concentrations and the relative change in air quality from existing levels;*
- *any significant air quality effects, mitigation action taken and any residual effects, distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project;*

- *the predicted absolute emissions, concentration change and absolute concentrations as a result of the proposed project, after mitigation methods have been applied; and*

- *any potential eutrophication impacts*."

2.2.5. Paragraph 5.2.10 states that: "*In addition, applicants should consider the Environment Targets (Fine Particulate Matter) (England) Regulations 2022 and associated Defra guidance*."

2.2.6. Paragraph 5.2.11 states that: "*Defra publishes future national projections of air quality based on estimates of future levels of emissions, traffic, and vehicle fleet. Projections are updated as the evidence base changes and the applicant should ensure these are current at the point of an application. The applicant's assessment should be consistent with this but may include more detailed modelling and evaluation to demonstrate local and national impacts. If an applicant believes they have robust additional supporting evidence, to the extent they could affect the conclusions of the assessment, they should include this in their representations to the Examining Authority along with the source*."

2.2.7. Paragraph 5.2.12 states that: "*Where a proposed development is likely to lead to a breach of any relevant statutory air quality limits, objectives or targets, or affect the ability of a non-compliant area to achieve compliance within the timescales set out in the most recent relevant air quality plan/strategy at the time of the decision, the applicant should work with the relevant authorities to secure appropriate mitigation measures to ensure that those statutory limits, objectives or targets are not breached*."

2.2.8. Paragraph 5.2.13 states that: "*The Secretary of State should consider whether mitigation measures are needed both for operational and construction emissions over and above any which may form part of the project application. A construction management plan may help codify mitigation at this stage. In doing so the Secretary of State should have regard to the Air Quality Strategy in England, or the Clean Air Plan for Wales in Wales, or any successors to these and should consider relevant advice within Local Air Quality Management guidance and PM2.5 targets guidance*."

2.2.9. Paragraph 5.2.14 states that: "*The mitigations identified in Section 5.14 on traffic and transport impacts will help mitigate the effects of air emissions from transport.*"

2.2.10. Paragraph 5.2.15 states that: "*Many activities involving air emissions are subject to pollution control. The considerations set out in Section 4.12 on the interface between planning and pollution control therefore apply. The Secretary of State must also consider duties under other legislation including duties under the Environment Act 2021 in relation to*

environmental targets and have regard to policies set out in the Government's Environmental Improvement Plan 2023."

2.2.11. Paragraph 5.2.16 states that: "*The Secretary of State should give air quality considerations substantial weight where a project would lead to a deterioration in air quality. This could for example include where an area breaches any national air quality limits or statutory air quality objectives. However, air quality considerations will also be important where substantial changes in air quality levels are expected, even if this does not lead to any breaches of statutory limits, objectives or targets*."

2.2.12. Paragraph 5.2.17 states that: "*The Secretary of State should give air quality considerations substantial weight where a project is proposed near a sensitive receptor site, such as an education or healthcare facility, residential use or a sensitive or protected habitat*."

2.2.13. Paragraph 5.2.18 states that: "*Where a project is proposed near to a sensitive receptor site for air quality, if the applicant cannot provide justification for this location, and a suitable mitigation plan, the Secretary of State should refuse consent*."

2.2.14. Paragraph 5.2.19 states that: "*In all cases, the Secretary of State must take account of any relevant statutory air quality limits, objectives and targets. If a project will lead to non-compliance with a statutory limit, objective or target the Secretary of State should refuse consent*."

2.2.15. Section 5.7 of NPS EN-1 **[Ref. 10]** details the planning policy for dust.

2.2.16. Paragraph 5.7.5 states that: "*The applicant should assess the potential for insect infestation and emissions of odour, dust, steam, smoke, and artificial light to have a detrimental impact on amenity, as part of the ES*."

2.2.17. Paragraph 5.7.6 states that: "*In particular, the assessment provided by the applicant should describe:*

- *the type, quantity and timing of emissions;*
- *aspects of the development which may give rise to emissions;*
- *premises or locations that may be affected by the emissions;*
- *effects of the emission on identified premises or locations;*
- *measures to be employed in preventing or mitigating the emissions*."

2.2.18. Paragraph 5.7.7 states that: "*The applicant is advised to consult the relevant local planning authority and, where appropriate, the EA about the scope and methodology of the assessment*."

2.2.19. Paragraph 5.7.8 states that: "*Mitigation measures may include one or more of the following:*

- *engineering: prevention of a specific emission at the point of generation; control, containment and abatement of emissions if generated;*
- *lay-out: adequate distance between source and sensitive receptors; reduced transport or handling of material;*
- *administrative: limiting operating times; restricting activities allowed on the site; implementing management plans*."

2.2.20. Paragraph 5.7.9 states that: "*Construction should be undertaken in a way that reduces emissions, for example the use of low emission mobile plant during the construction, and demolition phases as appropriate, and consideration should be given to making these mandatory in Development Consent Order requirements*."

2.2.21. Paragraph 5.7.10 states that: "*Demolition considerations should be embedded into designs at the outset to enable demolition techniques to be adopted that remove the need for explosive demolition*."

2.2.22. Paragraph 5.7.11 states that: "*A construction management plan may help clarify and secure mitigation*."

2.2.23. Paragraph 5.7.12 states that: "*The Secretary of State should satisfy itself that:*

- *an assessment of the potential for artificial light, dust, odour, smoke, steam and insect infestation to have a detrimental impact on amenity has been carried out;*
- *that all reasonable steps have been taken, and will be taken, to minimise any such detrimental impacts*."

National Policy Statement for Renewable Energy Infrastructure (NPS EN-3)

2.2.24. Section 2.10 of NPS EN-3 **[Ref. 11]** gives specific consideration to the assessment of emissions resulting from the proposed infrastructure.

National Planning Policy Framework (NPPF)

2.2.25. In February 2025, an update to the December 2024 NPPF **[Ref. 12]** was published. The NPPF includes a presumption in favour of sustainable development.

2.2.26. Section 2 of the NPPF deals with Achieving Sustainable Development and paragraph 8 states that "*Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):*

a) ***an economic objective*** *– to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;*

b) ***a social objective*** *– to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and*

c) ***an environmental objective*** *– to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.*

2.2.27. Section 15 of the NPPF deals with Conserving and Enhancing the Natural Environment, and paragraph 187 states that the intention is that the planning system should prevent "*new and existing development from contributing to, or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans*".

2.2.28. With specific regard to air quality, paragraph 199 of the NPPF states that "*Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that*

any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan".

Vale of Aylesbury Local Plan 2013-2033 (adopted September 2021)

2.2.29. Vale of Aylesbury Local Plan **[Ref. 13]** includes a policy relating to air quality for former district areas. Policy NE5 Pollution, air quality and contaminated land states the following:

"*Air quality*

Developments requiring planning permission that may have an adverse impact on air quality will be required to prove through a submitted air quality impact assessment that:

e. The effect of the proposal would not exceed the National Air Quality Strategy Standards (as replaced) or

f. The surrounding area would not be materially affected by existing and continuous poor air quality.

Potentially polluting developments will be required to assess their air quality impact with detailed air dispersion modelling and appropriate monitoring. Air quality impact assessments are also required for development proposals that would generate an increase in air pollution and are likely to have a significantly adverse impact on biodiversity. Required mitigation will be secured through a planning condition or Section 106 agreement".

Buckinghamshire Council Climate Change and Air Quality Strategy (adopted September 2021)

2.2.30. Buckinghamshire Council Climate Change and Air Quality Strategy **[Ref. 14]** is a plan that helps Buckinghamshire Council to achieve national air quality objectives and zero carbon ambitions. It details actions to address climate change and poor air quality. Section 8 Targets states the following:

"*Air Quality*

Aim 2: Improve air quality across Buckinghamshire pursuant to achieving national air quality objectives:

Objective C: Reduce emissions to air from all council operations.

Objective D: Reduce human exposure to harmful levels of air pollution".

2.2.31. Buckinghamshire Council recognises the need to use innovative solutions, and dedicate funding and technical support, to effectively deliver against

the objectives in this strategy and Section 9 entitled The Council's Emissions, states the following:

"*A range of initiatives to reduce our emissions have been implemented already ranging from energy efficiency and renewable energy projects to using electric vehicles in our fleet. We will investigate and implement appropriate measures to address mitigate and adapt to climate change and poor air quality.*

Actions

12. Explore the potential for renewable energy generation projects on the council's land (for example a solar farm)".

2.3. Guidance

Air quality strategy

2.3.1. United Kingdom (UK) air quality policy is published under the umbrella of the Environment Act 1995 **[Ref. 7]**, Part IV and specifically Section 80, the National Air Quality Strategy. The latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland – Working Together for Clean Air, published in July 2007 **[Ref. 15, 16]** sets air quality standards and objectives for ten key air pollutants to be achieved between 2003 and 2020.

2.3.2. The Clean Air Strategy 2019 **[Ref. 17]** sets out ways that the UK government will seek to tackle major sources of pollution. This latest strategy aims to have a more joined-up approach, outlining actions the Government plans to take to reduce emissions from transport, homes, agriculture and industry.

Interim Planning Guidance on the consideration of the Environment Act $PM_{2.5}$ targets in planning decisions.

2.3.3. The Department for Environment, Food and Rural Affairs (Defra) is developing guidance for applicants and Planning Authorities in England to demonstrate that they have appropriately considered the $PM_{2.5}$ targets when making planning applications and planning decisions. The following questions are designed to be used as prompts to support the interim process **[Ref. 18]**:

1. How has exposure to $PM_{2.5}$ been considered when selecting the development site?

Applicants are advised to consider the following in their application:

- *Site proximity to people (particularly large populations and/or vulnerable groups, e.g. schools, hospitals, care homes, areas of deprivation) and the impact of the development on these,*
- *Site proximity to pollution sources and the impact of these on users of the development,*
- *Exposure and emissions during both construction and in-use.*

2. What actions and/or mitigations have been considered to reduce $PM_{2.5}$ exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of $PM_{2.5}$ and its precursors?

Applicants are advised to explain (with evidence where possible) why each measure was implemented. Or, if no mitigation measures have been implemented, why this was not proposed. Actions can refer to, but are not limited to, the following:

- *Site layout,*
- *The development's design,*
- *Technology used in the construction or installed for use in the development,*
- *Construction and future use of the development.*

Local Air Quality Management Technical Guidance

2.3.4. The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities in their air quality review and assessment work. This guidance, referred to in this document as the Local Air Quality Management Technical Guidance ('Local Air Quality Management Technical Guidance 22') **[Ref. 19]**.

Land-Use Planning & Development Control: Planning for Air Quality

2.3.5. Environmental Protection UK and the Institute of Air Quality Management jointly published a revised version of the guidance note 'Land-Use Planning & Development Control: Planning for Air Quality' in 2017 (herein the 'Environmental Protection UK-Institute of Air Quality Management 2017 guidance') **[Ref. 20]** to facilitate consideration of air quality within local development control processes. It provides a framework for air quality considerations, promoting a consistent approach to the treatment of air quality issues within development control decisions.

2.3.6. The guidance includes methods for undertaking an air quality assessment and an approach for assessing the significance of effects. The guidance

note is widely accepted as an appropriate reference method for this purpose.

Guidance on the Assessment of Dust from Demolition and Construction

2.3.7. The Institute of Air Quality Management published a guidance document on the assessment of construction phase impacts **[Ref. 21]**. The guidance was produced to provide advice to developers, consultants and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM_{10} impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified.

Non-Road Mobile Machinery Practical Guide V.6

2.3.8. The Greater London Authority published a revised version of the guidance 'Non-Road Mobile Machinery Practical Guide V.6' **[Ref. 22]** in 2024 which provides guidance on the London non-road mobile machinery Low Emissions Zone, including the processes and procedures that must be in place on all development sites to comply with the policy.

Design Manual for Roads and Bridges LA 105 Air Quality

2.3.9. Design Manual for Roads and Bridges LA 105 Air Quality **[Ref. 23]** was updated by National Highways in June 2024 and sets out the requirements for assessing and reporting the effects of highway projects on air quality.

3. Assessment Scope

3.1. Overall approach

3.1.1. The approach taken for assessing the potential air quality impacts of the Proposed Development may be summarised as follows:

- Baseline characterisation of local air quality;
- Qualitative assessment of the construction and decommissioning phase of the proposed development;
- Qualitative assessment of the operation phase of the Proposed Development;
- Cumulative impact assessment; and
- Recommendation of mitigation measures, where appropriate, to ensure any adverse effects on air quality are minimised.

3.2. Baseline characterisation

3.2.1. Existing or baseline air quality refers to the concentrations of relevant substances that are already present in ambient air. These substances are emitted by various sources, including road traffic, industrial, domestic, agricultural and natural sources.

3.2.2. A desk-based study has been undertaken including a review of monitoring data available from Buckinghamshire Council and estimated background data from the Local Air Quality Management Support website maintained by Defra. Consideration has also been given to potential sources of air pollution and the presence of AQMAs.

3.3. Construction and decommissioning phases assessment methodology

Dust and particulate matter emissions during construction and decommissioning phases, including the operation of construction equipment.

3.3.1. Construction and decommissioning works for the Proposed Development have the potential to lead to the release of fugitive dust and particulate matter. An assessment of the likely significant effects of dust and particulate matter at sensitive receptors during the construction and decommissioning phases has therefore been undertaken following the Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction v2.2 **[Ref. 21]**.

3.3.2. Three separate dust impacts were considered:

- Annoyance due to dust soiling;

- The risk of health effects due to an increase in exposure to PM_{10}; and
- Harm to ecological receptors.

3.3.3. In order to assess the potential impacts of construction and decommissioning, activities are divided into four types:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (defined as the transport of dust and dirt from the construction/demolition sites onto public road network, where it may be deposited and then re-suspended by vehicles using the network).

3.3.4. The risk of dust and PM_{10} arising to cause disamenity and/or health or ecological impacts was based on an assessment of likely emissions magnitude and the sensitivity of the surrounding environment. The risk category may be different for each of the four construction activities.

3.3.5. **Annex 1: Construction Dust Assessment Methodology** of this report sets out the construction dust assessment methodology in detail as per the Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction v2.2 **[Ref. 21]**. Once the level of risk has been determined, then site-specific mitigation proportionate to the level of risk can be identified (as detailed in **Section 6** of this assessment).

3.3.6. The Magic Map application available online by Defra **[Ref. 24]** was used to identify designated habitats near the Site.

3.3.7. In the absence of any recommended guidance on the assessment of construction plant, the Non-Road Mobile Machinery Practical Guide **[Ref. 22]** has been adopted, which sets out the type of plant which is likely to have effects on air quality based on the size of plant. Whilst this guidance is used in London, taking account of the stricter emission limits set out by the Greater London Authority, it is considered robust for use for this assessment. The construction and decommissioning plant were then considered and assessed against the Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction v2.2 **[Ref. 21]** methodology which states "*consideration should be given to the number of plant/vehicles and their operating hours and locations to assess whether a significant effect is likely to occur*".

Road traffic exhaust emissions during construction and decommissioning phases

3.3.8. Exhaust emissions from construction and decommissioning phase vehicles may have an impact on local air quality adjacent to the routes

used by these vehicles to access the Site and in the vicinity of the Site itself. A qualitative screening level assessment against the Environmental Protection UK-Institute of Air Quality Management 2017 guidance **[Ref. 20]** screening criteria has been undertaken to assess the impacts on air quality due to construction and decommissioning phase traffic. **Table 3.1** below presents the Environmental Protection UK-Institute of Air Quality Management 2017 guidance **[Ref. 20]** screening criteria.

Table 3.1: Indicative criteria for requiring an air quality assessment (from Environmental Protection UK-Institute of Air Quality Management 2017 Guidance)

The development will	Indicative criteria to proceed to an air quality assessment
Cause a significant change in Light Duty Vehicle traffic slows on local roads with relevant receptors	A change of Light Duty Vehicle flows of: - more than 100 Annual Average Daily Traffic within or adjacent to an Air Quality Management Area more than 500 Annual Average Daily Traffic elsewhere
Cause a significant change in Heavy Duty Vehicle flows on local roads with relevant receptors	A Change of Heavy Duty Vehicle flows of: -more than 25 Annual Average Daily Traffic within or adjacent to an AQMA -more than 100 Annual Average Daily Traffic elsewhere

3.3.9. The Design Manual for Roads and Bridges LA 105 Air Quality [**Ref. 23**] sets out the requirements for assessing and reporting the effects of highway projects on air quality. The guidance states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the air quality assessment:

- Daily traffic flow changes of 1,000 Annual Average Daily Traffic or more; or
- Heavy Duty Vehicle flow changes of 200 Annual Average Daily Traffic or more.

3.3.10. Internationally, nationally and locally designated sites of ecological conservation importance on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity (known as designated habitats[1]) within 200m of the affected road network shall be included in the air quality assessment.

[1] Designated habitats include 'Ramsar' sites, Special Protection Areas, Special Areas of Conservation, Sites of Special Scientific Interest, Local Nature Reserves, Local Wildlife Sites, Nature Improvement Areas, ancient woodland and veteran trees.

3.3.11. A qualitative assessment against the Design Manual for Roads and Bridges LA 105 Air Quality **[Ref. 23]** screening criteria above has been undertaken to assess the impacts of the Proposed Development on Site of Specific Scientific Interest (SSSI), Local Wildlife Sites (LWSs), ancient woodlands and ancient semi-natural woodland due to construction and decommissioning phases traffic.

3.4. Operation phase assessment methodology

Dust and particulate matter emissions during the operation phase (including operation of the Proposed Development and maintenance activities)

3.4.1. Given the nature of the Proposed Development, no site activities resulting in significant emissions to air are anticipated during operation. Therefore, this assessment has not considered dust and particulate matter emissions from the operation of the Proposed Development any further.

3.4.2. No significant combustion sources such as combined heat and power plant or biomass boilers are proposed as part of the Proposed Development. The exception to this is the inclusion of two backup diesel generators, which will run for one hour per month for testing purposes. As the 1-hour NO_2 objective allows for 18 exceedances per year, it is judged highly unlikely that the 12 hours of operational use will combine with other nearby sources to cause an exceedance of the 1-hour NO_2 objective. Therefore, this report has not considered emissions related to stationary combustion emissions any further.

Road traffic exhaust emissions during the operation phase (including maintenance)

3.4.3. The Environmental Protection UK-Institute of Air Quality Management 2017 guidance **[Ref. 20]** and Design Manual for Roads and Bridges LA 105 Air Quality **[Ref. 23]** provide indicative criteria for when an air quality assessment is likely to be required. If none of the criteria are exceeded, it is considered unlikely that there will be any significant impacts on air quality during the operation phase.

3.4.4. Given the nature of the Proposed Development, there will only be limited movement of vehicles to the Site for maintenance. A screening level assessment against the Environmental Protection UK-Institute of Air Quality Management 2017 guidance **[Ref. 20]** and Design Manual for Roads and Bridges LA 105 Air Quality **[Ref. 23]** screening criteria has been undertaken in this assessment.

4. Baseline Air Quality Characterisation

4.1. Emissions sources and key air pollutants

4.1.1. The Site is located within the administrative area of Buckinghamshire Council The settlements of Calvert, Middle Claydon, Botolph Claydon, East Claydon and Hogshaw lie within 1.5km of parts of the Order Limits. Further afield (within 3km of the Order Limits) lie the settlements of Steeple Claydon, Edgecott, Shipton Lee, Quainton, Granborough and Winslow. Further detail on the location of the Site and its surroundings is detailed in **ES Volume 1, Chapter 2: Location of the Proposed Development [EN010158/APP/6.1].**

4.1.2. The main source of air pollution is likely to be road traffic emissions. The principal pollutants relevant to this assessment are considered to be NO_2, PM_{10} and $PM_{2.5}$, generally regarded as the most significant air pollutants released by vehicular combustion processes, or subsequently generated by vehicle emissions in the atmosphere through chemical reactions.

4.2. Presence of Air Quality Management Areas

4.2.1. The Proposed Development is located within the administrative area of Buckinghamshire Council. Buckinghamshire Council has currently declared five AQMAs. However, no AQMAs are located close to the Site. The closest AQMA is located in the neighbouring administrative area of Cherwell District Council in Bicester approximately 14km from the Order Limits. Therefore, the Proposed Development is not located within an AQMA.

4.3. Local authority air quality monitoring data

4.3.1. According to the Buckinghamshire Council 2024 Air Quality Annual Status Report **[Ref. 25]**, Buckinghamshire Council undertook automatic monitoring at two sites and non-automatic nitrogen dioxide (NO_2) diffusion tube monitoring at 176 locations during 2023.

4.3.2. NO_2 monitoring data is not available in the vicinity (within 3km) of the Order Limits. The nearest monitoring location to the study area is a roadside NO_2 diffusion tube location (Buckinghamshire Council reference: AV8) situated approximately 5.4km north east from the approximately centre of the Order Limits. The measured annual average NO_2 concentration at this diffusion tube site, for years 2019 – 2023, ranged between 19.3µg/m^3 and 27.3µg/m^3. The measured annual average NO_2 concentration at this diffusion tube site was 20.2µg/m^3 in 2023. These are below the annual mean NO_2 Air Quality Standard of 40µg/m^3. Particulate matter monitoring data is not available in the vicinity (within 3km) of the Order Limits.

4.4. Local air quality management background data

4.4.1. Estimated background air quality data available from the Local Air Quality Management website operated by Defra **[Ref. 26]**, may also be used to establish likely background air quality conditions at the Site.

4.4.2. The website provides estimated annual average background concentrations of NO_2, PM_{10} and $PM_{2.5}$ on a 1km^2 grid basis. **Table 4.1** reproduces estimated annual average background concentrations for the grid square containing the Proposed Development for years 2025 – 2029 (the latter representing the year during which construction is anticipated to commence).

4.4.3. No exceedances of the NO_2, PM_{10} or $PM_{2.5}$ Air Quality Standards are predicted. Background concentrations are in general predicted to fall with time, because of the reduction in emissions to air resulting from new vehicle technology (for example, improved engine performance, electric vehicles and improvements in fuel quality). Therefore, background concentrations in future years are not expected to exceed their respective annual mean standards.

Table 4.1: Local Air Quality Management estimated background annual average NO_2, PM_{10}, $PM_{2.5}$ concentrations at the Site (from 2021 base map)

Assessment year	Estimated annual average pollutant concentrations derived from the Local Air Quality Management support website		
	Annual average NO_2 (µg/m^3)	Annual average PM_{10} (µg/m^3)	Annual average $PM_{2.5}$ (µg/m^3)
2025 (current year)	5.8	11.7	6.4
2026	5.7	11.6	6.3
2027	5.5	11.5	6.3
2028	5.4	11.5	6.2
2029 (expected construction commencement)	5.2	11.4	6.1
Air Quality Standard	40	40	20

Note: Presented concentrations for 1 km^2 grid centred on 473500, 223500; approximate centre of the Site is 473901, 223918.

5. Assessment of Impacts

5.1. Construction and decommissioning phases assessment

5.1.1. Atmospheric emissions from construction and decommissioning activities will depend on a combination of the potential for emissions (the type of activity and prevailing conditions) and the effectiveness of control measures. In general terms, there are two sources of emissions that will need to be controlled to minimise the potential for adverse environmental effects:

- Dust emissions from site activities; and
- Exhaust emissions from site plant, equipment and vehicles.

Dust and particulate matter emissions during construction and decommissioning phases, including the operation of construction equipment.

Dust emissions from site activities

5.1.2. Dust emissions arising from construction and decommissioning activities are likely to be variable in nature and will depend upon the type and extent of the activity, soil type and moisture content, road surface conditions and weather conditions. Periods of dry weather combined with higher than average wind speeds have the potential to generate more dust.

5.1.3. The construction and decommissioning activities anticipated as part of the Proposed Development that are often the most significant potential sources of fugitive dust emissions are:

- Demolition (during decommissioning phase only);
- Earthworks comprising of levelling, construction of foundations, haulage, tipping, stockpiling, landscaping and tree removal;
- Construction of the Proposed Development; and
- Trackout, involving the movement of vehicles over surfaces where muddy materials have been transferred off-site (for example, on to public highways).

Dust emissions magnitude

5.1.4. With reference to the Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction v2.2 **[Ref. 21]** criteria outlined in **Annex 1: Construction Dust Assessment Methodology** of this assessment, the dust emissions magnitude for demolition, earthworks, construction and trackout activities are summarised in **Table 5.1**.

Table 5.1: Summary of dust emission magnitude (before mitigation)

Activity	Evaluation of the effects	Dust emission magnitude
Demolition (during decommissioning phase)	- The total building volume to be demolished is assumed to be 12,000m^3-75,000m^3. - No on-site crushing and screening is proposed. - The height of demolition activities above ground is estimated to be <6m. - Demolition materials are potentially dusty.	Medium
Earthworks	- Total site area is >110,000m^2. - The number of heavy earthmoving vehicles active at any one time is expected to be 5-10. - The height of stockpiled materials is assumed to be 3-6m.	Medium
Construction	- Total building volume is estimated to be 12,000m^3-75,000m^3. - No on-site concrete batching and sandblasting is proposed. - Construction materials are considered to be potentially dusty.	Medium
Trackout	- The number of Heavy Duty Vehicle outward movements in any one day is estimated to be >50. - The extent as to which vehicles are to travel on unpaved roads is assumed to be >100m.	Large

Sensitivity of the area

5.1.5. As per the Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction v2.2 **[Ref. 21]**, the sensitivity of the area takes into account a number of factors, comprising:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM_{10}, the local background concentration; and
- Site specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

5.1.6. Consideration is given to human receptors and designated habitats; distances are calculated from the Order Limits and the trackout route proposed.

5.1.7. **ES Volume 3, Figures 6.1** and **6.2 [EN010158/APP/6.3]** show maps indicating the demolition (during decommissioning phase)/earthworks/ construction activities study areas and trackout activities study areas respectively, for identifying the sensitivity of the area. **Table 5.2** presents the determined sensitivity of the area. Construction activities are relevant up to 250m from the Order Limits whereas trackout activities are only considered relevant up to 50m from the edge of the road, as per the Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction v2.2 **[Ref. 21]**.

5.1.8. Human receptors have been identified within 250m of the Order Limits, comprising:

- Settlement of Botolph Claydon; and
- Settlement of East Claydon.

5.1.9. **ES Volume 3, Figures 6.3 [EN010158/APP/6.3]** shows the location of sensitive air quality receptors.

5.1.10. The following designated habitats have been identified within 200m of the Order Limits, through none are within the Order Limits:

- Bernwood BOA (overlaps with Parcels 1, 1a and 2 and the Interconnecting Cable Corridors)
- Sheephouse Wood Site of Specific Scientific Interest (SSSI) (adjacent to Parcel 1 and Parcel 1a);
- Finemere Wood SSSI (adjacent to Parcel 2);
- Shrub Woods LWS (adjacent to Parcel 1);
- Decoypond Wood LWS (adjacent to Parcel 1);
- Romer Wood LWS (located within the Internal Access Corridor to the north of Parcel 1a);
- Runts Wood LWS (adjacent to Parcel 2);
- Home Wood, Middle Claydon LWS (adjacent to the Interconnecting Cable Corridors);
- Balmore Wood LWS (95m west of Parcel 2);
- Greatsea Wood LWS (located within the Internal Access Corridor to the north of Parcel 1a) and;
- Calvert Railway Station LWS (174m west of Parcel 1).

Table 5.2: Sensitivity of the area

Potential impact		Sensitivity of the area			
		Demolition (during decommissioning phase)	Earthworks	Construction	Trackout
Dust soiling	Receptor sensitivity	High	High	High	Low
	Number of receptors	10-100	10-100	10-100	>1
	Distance from the source	<20m	<20m	<20m	<20m
	Sensitivity of the area	High	High	High	Low
Human health	Receptor sensitivity	High	High	High	Low
	Annual mean PM_{10} concentration	<24µg/m^3	<24µg/m^3	<24µg/m^3	-
	Number of receptors	10-100	10-100	10-100	≥1
	Distance from the source	<20 m	<20m	<20m	<20m
	Sensitivity of the area	Low	Low	Low	Low
Ecological	Receptor sensitivity*	Low-Medium	Low-Medium	Low-Medium	Low-Medium
	Distance from the source	<20m	<20m	<20m	>50m
	Sensitivity of the area	Low-Medium	Low-Medium	Low-Medium	Low

SSSI listed in **Section 5.2.8 are considered to have a medium sensitivity to dust deposition. LWSs and ancient woodlands and ancient semi-natural woodlands listed in **Section 5.2.8** are considered to have a low sensitivity to dust deposition.*

Risk of dust impacts

5.1.11. The dust emission magnitude (refer to **Table 5.1**) is combined with the sensitivity of the area (refer to **Table 5.2**) to determine the risk of impacts of construction activities before mitigation; these are evaluated based on risk categories of each activity in **Annex 1: Construction Dust Assessment Methodology** of this assessment. The risk of dust impacts from construction and decommissioning activities is identified in **Table 5.3**. Site specific mitigation measures to reduce construction and decommissioning phase impacts are defined based on this assessment in **Section 6**.

Table 5.3: Summary of the dust risk from construction activities

Potential impact	Dust risk impact			
	Demolition (during decommissioning phase)	Earthworks	Construction	Trackout
Dust soiling	Medium risk	Medium risk	Medium risk	Low risk
Human health	Low risk	Low risk	Low risk	Low risk
Ecological	Low risk-Medium risk	Low risk-Medium risk	Low risk-Medium risk	Low risk

Exhaust emissions from construction and decommissioning plant

5.1.12. As set out in the Non-Road Mobile Machinery Practical Guide **[Ref. 22]**, only construction and decommissioning plant with a rated power output between 37-560kW is likely to give rise to air quality effects. Plant sized between 37-560kW which is likely to be used during the construction and decommissioning of the Proposed Development is likely to comprise:

- Excavator;
- Dump truck;
- Vibrating roller;
- Piling rig;
- Concrete mixer;
- Tele-handler
- Unloading crane; and
- Mobile elevating work platform.

5.1.13. The above plant would be used intermittently during the 30-month construction programme, depending on the construction activities to be undertaken and would move across the Site as the Proposed Development is built out. Construction working hours will be from 07:00 until 19:00 Monday to Friday and from 07:00 until 12:00 on Saturday. There will be no working on Sundays or Bank Holidays unless necessary and agreed with the local planning authority.

5.1.14. The setback distances from the residential properties and environmental designated sites are included within the **Design Commitments [EN010158/APP/5.9]** and listed within **ES Volume 1, Chapter 6: Air Quality [EN010158/APP/6.1]**. The setback distances, as well as the temporary nature of the plant to be used, and the low levels of air pollution at the Site (refer to **Sections 4.3 and 4.4**) means it is unlikely there would be a risk of emissions (either in isolation or combination) that could result in an exceedance of the Air Quality Standards. Furthermore, construction and decommissioning plant will be managed in a way which minimises the potential air quality impacts at sensitive receptor locations through measures included within the **Outline Construction Environmental Management Plan (Outline CEMP) [EN010158/APP/7.2]** and **Outline Decommissioning Environmental Management Plan (Outline DEMP) [EN010158/APP/7.4]**. Therefore, there is likely to be no significant air quality effects as a result of the construction and decommissioning plant of the Proposed Development.

Road traffic exhaust emissions during construction and decommissioning phases

5.1.15. The operation of vehicles powered by internal combustion engines results in the emission of exhaust gases containing the pollutants nitrogen oxides, PM_{10}, volatile organic compounds and carbon monoxide. The quantities emitted depend on factors such as engine type, service history, pattern of usage and fuel composition.

5.1.16. Construction and decommissioning traffic will comprise haulage/ construction/decommissioning vehicles and vehicles used for workers' trips to and from the Site. The greatest impact on air quality due to emissions from construction and decommissioning phase vehicles will be in areas adjacent to the application Site accesses and nearby road network.

Construction phase traffic

5.1.17. Construction phase Annual Average Daily Traffic data (AADT) (two-way trips) assumes that the year 2029 is the anticipated construction traffic peak. The year 2029 is the anticipated construction traffic peak as construction is scheduled to commence in 2029 and as traffic growth

increases year on year and any percentage impacts would therefore reduce beyond 2029. Construction phase traffic data is provided in **Table 5.4**.

Table 5.4: Summary of the dust risk from construction activities

Road	2029 construction traffic associated with the Proposed Development	
	Light Duty Vehicles (AADT)	Heavy Duty Vehicles (AADT)
A34	10	0
M40 North	10	18
M40 South	10	24
A41	29	100
A41 Bicester	109	100
A41 West	109	138
A41 East	109	3
Station Road/Dewes Lane	218	141
Snake Lane/Fiddlers Field	218	141
Claydon Road	218	141
Granborough Road	74	31

5.1.18. The Proposed Development is not predicted to generate Light Duty Vehicle movements exceeding the Environmental Protection UK-Institute of Air Quality Management 2017 guidance screening criteria **[Ref. 20]** (i.e. a change of Light Duty Vehicle flows of more than 500 AADT) during the construction phase. The predicted construction phase Heavy Duty Vehicle generation slightly exceeds the Environmental Protection UK-Institute of Air Quality Management 2017 guidance **[Ref. 20]** screening criteria (i.e. a change of Heavy Duty Vehicle flows of more than 100 AADT) on A41 West, Station Road/Dewes Lane, Snake Lane/Fiddlers Field and Claydon Road. However, as per the review of baseline conditions in **Section 4**, the annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations at the Site are expected to be well below the Air Quality Standards. The traffic effects during construction would be limited to a relatively short period at each phase of the Proposed Development and would be along traffic routes employed by haulage/construction vehicles and workers. Therefore, it is considered unlikely that the additional construction phase traffic emissions as a result of the Proposed Development would cause a significant adverse effect on local air quality and on nearby human receptors.

5.1.19. The Proposed Development is not predicted to generate construction traffic exceeding the Design Manual for Roads and Bridges LA 105 Air Quality [**Ref. 23**] screening criteria (i.e. Light Duty Vehicle flow changes of 1,000 AADT or more or Heavy Duty Vehicle flow changes of 200 AADT or more) during the construction phase. Therefore, it is considered unlikely that the additional construction phase traffic emissions as a result of the Proposed Development would cause a significant adverse effect on designated habitats.

Decommissioning phase traffic

5.1.20. The decommissioning year is assumed to be 40 years from commissioning. It is assumed that vehicular generation during decommissioning phase is similar or slightly fewer than the construction phase.

5.1.21. The Proposed Development is not expected to generate traffic exceeding the Environmental Protection UK-Institute of Air Quality Management 2017 guidance **[Ref. 20]** and Design Manual for Roads and Bridges LA 105 Air Quality **[Ref. 23]** screening criteria during the decommissioning phase. Therefore, it is considered unlikely that the additional decommissioning phase traffic emissions as a result of the Proposed Development would cause a significant adverse effect on local air quality, and human receptors and designated habitats.

5.2. Operation phase assessment

Road traffic exhaust emission during the operation phase (including maintenance)

5.2.1. Due to the nature of the Proposed Development, the principal operation (including maintenance) phase air quality impact is likely to be associated with traffic emissions as a result of any changes in traffic flows or flow composition the Proposed Development may bring. The vehicle trip generation from the Proposed Development once operational is anticipated to be minimal in comparison to the construction and decommissioning phases.

5.2.2. The Proposed Development is not expected to generate traffic exceeding the Environmental Protection UK-Institute of Air Quality Management 2017 guidance **[Ref. 20]** and Design Manual for Roads and Bridges LA 105 Air Quality **[Ref. 23]** screening criteria once operational. Therefore, it is considered that further assessment of the operation (including maintenance) phase traffic emissions is not required. The increased road traffic emissions resulting from the Proposed Development are expected to have a negligible impact on air quality, and human receptors and designated habitats during the operation (including maintenance) phase.

The effect of road traffic exhaust emissions during operation phase without mitigation measures is considered to be not significant.

6. Mitigation measures

6.1. Construction and decommissioning phases

Dust emissions from site activities

6.1.1. The dust emitting activities outlined in **Section 5** can be effectively controlled by appropriate dust control measures (described in **Table 6.1** below) and any adverse effects can be greatly reduced or eliminated. The mitigation measures described in **Table 6.1** will be used to control potential dust and particulate matter emissions during the construction and decommissioning phases. Mitigation measures are documented within and will be secured by the **Outline CEMP [EN010158/APP/7.2]** and the **Outline DEMP [EN010158/APP/7.4]**.

6.1.2. The categories identified have been used to define appropriate, site-specific mitigation measures for the Proposed Development, which are divided into general measures and measures specific to demolition, earthworks, construction and trackout. Depending on the level of risk, different mitigation measures are assigned, in accordance with the Institute of Air Quality Management Guidance on the Assessment of Dust from Demolition and Construction v2.2 **[Ref. 21]**. For general mitigation measures, the highest risk assessed has been applied.

Table 6.1: Dust emissions mitigation measures

Communications
• Develop and implement a stakeholder communications plan that includes community engagement before work commences on Site. • Display the name and contact details of people accountable for air quality and dust issues with respect to the Proposed Development at the Primary Construction Compound. This may be the Environmental Manager/engineer or the Site Manager. • Implement a Construction Environmental Management Plan, which includes measures to control all emissions, to be approved by the Local Planning Authority.
Site management
• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the Local Planning Authority when asked. • Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site and the action taken to resolve the situation in the logbook.
Monitoring

- Undertake regular on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the Local Planning Authority when asked. Monitoring will, where possible, should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of the Order Limits in agreement with the relevant homeowners/landowners.
- Carry out regular Site inspections to monitor compliance with the Construction Environmental Management Plan, record inspection results, and make an inspection log available to the Local Planning Authority when asked.
- Increase the frequency of Site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- During the construction and decommissioning phases, agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Planning Authority. Where possible, commence baseline monitoring at least three months before work commences on Site.

Preparing and maintaining the Site

- Plan Site layout so that machinery and dust causing activities are located away from sensitive receptors, as far as is possible.
- Erect solid screens or barriers around activities where there is a high potential for dust production.
- Avoid runoff of water or mud from the Site. This may include measures such as diverting run-off, installing sediment traps and/or swales.
- Keep Site fencing, barriers and scaffolding clean.
- Remove materials that have a potential to produce dust from Site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating vehicle/machinery and sustainable travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas.
- Implement a Travel plan (part of the **Outline CTMP [EN010158/APP/7.5]**) that supports and encourages sustainable travel.

Construction operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Measures specific to demolition (during decommissioning phase only)

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
- Ensure effective water suppression is used during demolition operations.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Measures specific to earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in stages during work and not all at once.

Measures specific to construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures specific to trackout

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site.
- Avoid any dry sweeping of large areas.
- Ensure vehicles entering and leaving Site are covered to prevent escape of materials during transport.
- Record all inspections of haul routes and any subsequent action in a Site logbook.
- Implement a wheel washing system.

Exhaust emissions from construction and decommissioning plant

6.1.3. Any emissions from non-road mobile machinery can be reduced by ensuring that any plant used on-site comply with the nitrogen oxides, particulate matter and carbon monoxide emissions standards specified in the Regulation (EU) 2016/1628 of the European Parliament and of the Council (as amended) **[Ref. 27]** as a minimum, where they have net power of between 37kW and 560kW. The emissions standards vary depending on the net power the engine produces. The emissions controls are outlined and secured within the **Outline CEMP [EN010158/APP/7.2]** and the **Outline DEMP [EN010158/APP/7.4]** which have been prepared and are submitted in the support of the DCO Application. The construction working hours are detailed within the **Outline CEMP [EN010158/APP/7.2]**.

Road traffic exhaust emissions during construction and decommissioning phases

6.1.4. Any effects on air quality from traffic during construction and decommissioning of the Proposed Development would be temporary (i.e. during the construction/decommissioning period only) and can be suitably controlled by the employment of mitigation measures (described in **Table 6.1** above and documented within the **Outline Construction Traffic Management Plan (Outline CTMP) [EN010158/APP/7.5]** and **Outline Travel Plan** (part of the **Outline CTMP [EN010158/APP/7.5]**)) which has been prepared and is submitted in support of the DCO Application.

6.2. Operation phase

Road traffic exhaust emissions during the operation phase (including maintenance)

6.2.1. No specific operation phase mitigation measures are required. Nevertheless, best practice mitigation measures (described in **Table 6.1** above) can be considered to further reduce any residual effects on air quality. An **Outline Operational Environmental Management Plan**

(Outline OEMP) [EN010158/APP/7.3] including such measures described has been prepared and is submitted in support of the DCO Application.

7. Residual Effects

7.1. Construction and decommissioning phases

Dust and particulate matter emissions during construction and decommissioning phases, including the operation of construction equipment

7.1.1. Construction and decommissioning effects are not significant provided that appropriate dust control and construction and decommissioning phases mitigation measures are applied as listed in the mitigation measures section (refer to **Paragraphs 6.1.1 to 6.1.3**). Residual effect is therefore **not significant**.

Road traffic exhaust emissions during construction and decommissioning phases

7.1.2. Any effects on air quality from traffic during construction and decommissioning of the Proposed Development will be temporary (i.e. during the construction/decommissioning period only) and can be suitably controlled by the employment of mitigation measures (refer to **Paragraph 6.1.4**). Residual effect is therefore **not significant**.

7.2. Operation phase

Road traffic exhaust emissions during the operation phase (including maintenance)

7.2.1. The Proposed Development is not anticipated to have a significant effect on local air quality. Nevertheless, best practice mitigation measures described in **Table 6.1** and documented within the **Outline OEMP [EN010158/APP/7.3]** can be considered to further reduce any residual effects on air quality. Residual effect of the Proposed Development on air quality whilst it is in operation is considered to be **not significant**.

8. Cumulative effects

8.1. Construction and decommissioning phases

8.1.1. The phasing/commencement of any other committed (i.e. permitted and proposed) developments in the locality could potentially result in a scenario where a number of other construction sites are in operation at the same time as the Proposed Development and concurrently generating emissions to air.

8.1.2. The IAQM 2024 construction dust guidance **[Ref. 19]** states that beyond 250m from a site boundary, the risk of impact from activities carried out on-site during the construction phase can be considered to be negligible. There are four developments within 250m of the Order Limits, which are the East Claydon Greener Grid (25/01297/APP), solar farm development at Tuckey Farm East Claydon Road (19/00983/APP), High Speed Rail 2 development, and a solar park development on a capped part of the Calvert Landfill Site (CM/0016/21). All developments are expected to agree and follow a site specific Construction Environmental Management Plan or Dust Management Plan and Decommissioning Environmental Management Plan that will adequately control dust emissions and construction/decommissioning plant exhaust emissions from construction and decommissioning. Therefore, with appropriate mitigation measures in place, the construction phase cumulative effect is considered to be **not significant.**

8.1.3. As per the construction phase impacts, all permitted developments are expected to agree and follow a site specific Decommissioning Environmental Management Plan during decommissioning phase, that will adequately control dust emissions, decommissioning plant exhaust emissions and road traffic exhaust emission from decommissioning. Therefore, with appropriate mitigation measures in place, the decommissioning phase cumulative effect is considered to be **not significant.**

8.2. Operation phase

8.2.1. The Proposed Development and other existing development and/or approved developments are not predicted to generate traffic exceeding the relevant screening criteria (i.e. Environmental Protection UK-Institute of Air Quality Management 2017 guidance **[Ref. 20]**, and Design Manual for Roads and Bridges LA 105 Air Quality **[Ref. 23]** screening criteria) once operational. All permitted developments are expected to follow best practice mitigation measures to minimise emissions to air. Therefore, exceedance of the relevant Air Quality Standards is considered unlikely and cumulative operation phase effects are considered **not significant.**

9. References

Ref. 1: Air Quality (England) Regulations 2000. Available online: https://www.legislation.gov.uk/uksi/2000/928/contents/made

Ref. 2: Air Quality (England) (Amendment) Regulations 2002. Available online: https://www.legislation.gov.uk/uksi/2002/3043/contents/made

Ref. 3: The Air Quality Limit Values Regulations 2003. Available online: https://www.legislation.gov.uk/uksi/2003/2121/made

Ref. 4: Directive 2008/50/EC of the European Parliament and of the Council of 21st May 2008 on Ambient Air Quality and Cleaner Air for Europe. Available online: https://faolex.fao.org/docs/pdf/eur80016.pdf

Ref. 5: Air Quality Standards Regulations 2010. Available online: https://www.legislation.gov.uk/uksi/2010/1001/contents/made

Ref. 6: Air Quality Standards (Amendment) Regulations 2016. Available online: https://www.legislation.gov.uk/uksi/2016/1184/contents/made

Ref. 7: Environment Act 1995. Available online: https://www.legislation.gov.uk/ukpga/1995/25/contents

Ref. 8: Environment Act 2021. Available online: https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted

Ref. 9: Environment Targets (Fine Particulate Matter) (England) Regulations 2023. Available online: https://www.legislation.gov.uk/uksi/2023/96/contents/made

Ref. 10: Department for Energy Security and Net Zero (2023). Overarching National Policy Statement for Energy (EN-1). Available online: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1

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Annex 1: Construction Dust Assessment Methodology

1.1 Construction dust assessment methodology

1.1.1 This appendix contains the construction dust assessment methodology used in the assessment.

1.1.2 To assess the potential impacts, construction activities are divided into demolition, earthworks, construction and trackout. The descriptors included in this section are based upon the IAQM 2024 construction dust guidance **[Ref. 19]**. The assessment follows the steps recommended in the guidance.

Step 1: Screen the requirement for assessment

1.1.3 The first step is to screen out the requirement for a construction dust assessment, this is usually a somewhat conservative level of screening. An assessment is usually required where there is:

- a 'human receptor' within:
  - 250m of the boundary of the Site; or
  - 50m of the route used by construction vehicles on the public highway, up to 250m from the Site entrance(s).
- an 'ecological receptor':
  - 50m of the boundary of the Site; or
  - 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the Site entrance(s).

Step 2A: Defining the Potential Dust Emission Magnitude

Demolition

1.1.4 The dust emission magnitude category for demolition is varied for each site in terms of timing, building type, duration and scale. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large**: Total building volume >75,000m^3, potentially dusty construction material, on-site crushing and screening, demolition activities >12m above ground level;
- **Medium**: Total building volume 12,000m^3 – 75,000m^3, potentially dusty construction material, demolition activities 6m – 12m above ground level; and
- **Small**: Total building volume <12,000m^3, construction material with low potential for dust release, demolition activities <6m above ground, demolition during wetter months.

Earthworks

1.1.5 The dust emission magnitude category for earthworks is varied for each site in terms of timing, geology, topography and duration. Examples of the potential dust emission classes are provided in the guidance as follows:

- **Large**: Total site area >110,000m^2, potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds >6m in height;
- **Medium**: Total site area 18,000m^2 – 110,000m^2, moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 3m – 6m in height; and
- **Small**: Total site area < 18,000m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3m in height.

Construction

1.1.6 The dust emission magnitude category for construction is varied for each site in terms of timing, building type, duration, and scale. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large**: Total building volume >75,000m^3, on-site concrete batching, sandblasting;
- **Medium**: Total building volume 12,000m^3 – 75,000m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching; and
- **Small**: Total building volume <12,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

1.1.7 Factors which determine the dust emission magnitude class of trackout activities are vehicle size, vehicle speed, vehicle number, geology and duration. Examples of the potential dust emissions classes are provided in the guidance as follows:

- **Large**: >50 Heavy Duty Vehicle (>3.5 t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- **Medium**: 20 – 50 Heavy Duty Vehicle (>3.5 t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 – 100m; and
- **Small**: <20 Heavy Duty Vehicle (>3.5 t) trips in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B: Defining the Sensitivity of the Area

1.1.8 The sensitivity of the area is defined for dust soiling, human health and ecosystems. The sensitivity of the area takes into account the following factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM_{10}, the local background concentration; and
- site-specific factors, such as whether here are natural shelters such as trees, to reduce the risk of wind-blown dust.

1.1.9 **Table 1** has been used to define the sensitivity of different types of receptors to dust soiling, health effects and ecological effects.

Table 1: Scale of receptors sensitivity

Sensitivity of receptor	Dust soiling	Human receptors	Ecological receptors
High	Users can reasonably expect an enjoyment of a high level of amenity. The appearance, aesthetics or value of their property would be diminished by soiling. The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Examples include dwellings, museums and	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Examples include residential properties, hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas	Locations with an international or national designation and the designated features may be affected by dust soiling. Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain published by Joint Nature Conservation Committee **[Ref. 28]**. Examples include a Special Area of Conservation designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large

Sensitivity of receptor	Dust soiling	Human receptors	Ecological receptors
	other culturally important collections, medium and long term car parks and car showrooms.	for the purposes of this assessment.	site containing concrete (alkali) buildings.
Medium	Users would expect to enjoy a reasonable level of amenity but would not reasonably expect to enjoy the same level of amenity as in their home. The appearance, aesthetics or value of their property could be diminished by soiling. The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Examples include parks and places of work.	Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Examples include office and shop workers but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. Locations with a national designation where the features may be affected by dust deposition. Example is a Site of Special Scientific Interest with dust sensitive features.
Low	The enjoyment of amenity would not reasonably be expected.	Locations where human exposure is transient.	Locations with a local designation where the features may be

Sensitivity of receptor	Dust soiling	Human receptors	Ecological receptors
	Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling. There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.	Examples include public footpaths, playing fields, parks and shopping streets.	affected by dust deposition. Example is a Local Nature Reserve with dust sensitive features.

1.1.10 Based on the sensitivities assigned of the different types of receptors surrounding the Site and numbers of receptors within certain distances of the site, a sensitivity classification for the area can be defined for each. **Tables 2** to **4** indicate the method used to determine the sensitivity of the area for dust soiling, human health and ecological impacts, respectively.

1.1.11 For trackout, as per the IAQM 2024 construction dust guidance **[Ref. 19]**, it is only considered necessary to consider trackout impacts up to 50m from the edge of the road.

Table 2: Sensitivity of the area to dust soiling effects on people and property

Receptor sensitivity	Number of receptors	Distances from the source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 3: Sensitivity of the area to human health impacts

Receptor sensitivity	Annual mean PM_{10} concentration	Number of receptors	Distances from the source (m)			
			<20	<50	<100	<250
High	>32 µg/m^3	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m^3	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m^3	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Table 4: Sensitivity of the area to ecological impacts

Receptor sensitivity	Distances from the source (m) <20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2C: Defining the Risk of Impacts

1.1.12 The final step is to use both the dust emission magnitude classification with the sensitivity of the area, to determine a potential risk of impacts for each construction activity, before the application of mitigation. **Tables 5** to **8** indicate the method used to assign the level of risk for each construction activity.

Table 5: Risk of dust impacts from demolition

Sensitivity of area	Dust emission magnitude Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 6: Risk of dust impacts from earthworks

Sensitivity of area	Dust emission magnitude Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 7: Risk of dust impacts from construction

Sensitivity of area	Dust emission magnitude Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 8: Risk of dust impacts from trackout

Sensitivity of area	Dust emission magnitude Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk

Sensitivity of area	Dust emission magnitude		
	Large	Medium	Small
Low	Low Risk	Low Risk	Negligible

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