OAKLANDS FARM SOLAR PARK

Applicant: Oaklands Farm Solar Ltd

Environmental Statement
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Appendix 16.1 - Air Quality Assessment

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Air Quality Assessment	
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1 Introduction

1.1.1 Air Quality Assessments Ltd (AQA) has been commissioned by LUC to undertake an air quality assessment for the proposed development of Oaklands Farm Solar Park, located on land between Walton-on-Trent and Rosliston, South Derbyshire. The application site is shown in **Figure 1** on **Page 11**. There is a risk that emissions due to traffic generated by the proposed development would impact on local air quality.

1.1.2 This report describes the existing air quality conditions in proximity to the site and considers the effect of the development on local air quality. The main air pollutants of concern related to the health effects of road traffic emissions are nitrogen dioxide (NO_2) and fine particulate matter (PM_{10} and $PM_{2.5}$).

1.1.3 There is also the potential for the construction works to impact upon existing properties. The main pollutants of concern related to construction activities are dust and PM_{10}.

1.1.4 The assessment has been prepared taking into account all relevant local and national guidance and regulations.

2 Air Quality Legislation and Policy

2.1. EU Limit Values

2.1.1 The European Union's Directive on ambient air quality and cleaner air for Europe (European Parliament, Council of the European Union, 2008) set legally binding limit values for NO_2, PM_{10} and $PM_{2.5}$. The Air Quality Standards Regulations 2010 (The Stationary Office, 2010) implement the EU Directive limit values in English legislation. Achievement of the limit values is a national obligation rather than a local one.

2.1.2 The United Kingdom left the European Union on 31st January 2020; however, the EU legislation currently remains enshrined in UK law through the Air Quality Standards Regulations.

2.1.3 The limit values for NO_2 and PM_{10} are the same as the objective values (see below). Limit values apply at all locations, apart from where the public does not have access, where health and safety at work provisions apply and on the road carriageway. The limit value compliance dates differ from the objectives; the PM_{10} and NO_2 limit values applied from 2005 and 2010 respectively, whereas the $PM_{2.5}$ limit value applied from 2020.

2.2. National Legislation

2.2.1 Part IV of The Environment Act 1995, as amended by the Environment Act 2021, required the UK Government to prepare a national Air Quality Strategy. A new Air Quality Strategy for England was published in April 2023 (Defra, 2023a). The Air Quality Strategy sets out the actions that Defra expects local authorities to take in support of long-term air quality goals, including new $PM_{2.5}$ targets, and provides a framework to enable local authorities to make the best use of their powers and make improvements for their communities.

2.2.2 The strategy sets out air quality standards and objectives intended to protect human health and the environment. Standards are the concentrations of pollutants in the atmosphere, below which there is a minimum risk of health effects or ecosystem damage; they are set with regard to scientific and medical evidence. Objectives are the policy targets set by the Government, taking account of economic efficiency, practicability, technical feasibility and timescale, where the standards are expected to be achieved by a certain date. The Government has also published a Clean Air Strategy, which provides an overview of the actions that the government will take to improve air quality (Defra, 2019). The actions in the Clean Air Strategy focus on emissions from transport, the home, farming, and industry.

2.2.3 The Air Quality Strategy also describes the system of Local Air Quality Management (LAQM), which was introduced in Part IV of the Environment Act 1995. LAQM requires every local authority to carry out regular review and assessments of air quality in its area. Where an objective has not been, or is unlikely to be achieved, the local authority must declare an Air Quality Management Area (AQMA) and prepare an action plan which sets out appropriate measures to be introduced in pursuit of the objectives. $PM_{2.5}$ is not included in the LAQM framework; however, the government expects all local authorities to effectively use their powers to reduce $PM_{2.5}$ emissions from the sources which are within their control.

2.2.4 The objectives for NO_2 and PM_{10}, as prescribed by the Air Quality (England) Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002 (The Stationary Office, 2000; The Stationary Office, 2002), are shown in **Table 1**. The objectives for PM_{10} and NO_2 were to have been achieved by 2004 and 2005 respectively and continue to apply in all future years thereafter.

2.2.5 The air quality limit value for $PM_{2.5}$, also shown in **Table 1**, was to be achieved by 2020. The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 set out two legally binding targets for $PM_{2.5}$, with interim targets for each set out in the Environmental Improvement Plan 2023 (The Stationery Office, 2023; Defra, 2023b). The $PM_{2.5}$ targets are:

- 10µg/m^3 annual mean concentration $PM_{2.5}$ nationwide by 2040, with an interim target of 12µg/m^3 by January 2028; and
- 35% reduction in average population exposure by 2040, with an interim target of a 22% reduction by January 2028, both compared to a 2018 baseline.

Table 1: The Objectives for NO_2 and PM_{10} and the $PM_{2.5}$ Limit Value

Pollutant	Concentration Measured As	Objective/Limit Value
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

2.2.6 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective. Examples of where the objectives should apply are provided in the Local Air Quality Management Technical Guidance (Defra, 2022) issued by the Department for Environment, Food and Rural Affairs (Defra). The annual mean NO_2 and PM_{10} objectives should apply at the building façades of residential properties, schools, hospitals, care homes etc.; they should not apply at the building façades of places of work, hotels, gardens or kerbside sites. The 24-hour mean PM_{10} objective should apply at all locations where the annual mean objective applies, as well as the gardens of residential properties and hotels. The 1-hour mean NO_2 objective should apply at all locations where the annual and 24-hour mean objectives apply, as well as at kerbside sites where the public have regular access, e.g., the pavements of busy shopping streets.

2.3. Planning Policy

National Policies

2.3.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied (Department for Levelling Up,

Housing and Communities, 2023). It provides a framework within which locally prepared plans for development can be produced. At Paragraph 8c, the NPPF states that the purpose of the planning system is to contribute to the achievement of sustainable development and includes an overarching 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."

2.3.2 With regard to environmental impacts from traffic, at Paragraph 108 the NPPF states that:

"Transport issues should be considered from the earliest stages of plan-making and development proposals, so that: …

d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; …"

2.3.3 The NPPF also states at Paragraph 180 that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by: …

e) preventing new and existing development from contributing to, 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; …"

2.3.4 The NPPF goes on to state at Paragraph 191:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development."

2.3.5 With specific reference to air quality, the NPPF states at Paragraph 192 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."

2.3.6 The NPPF also includes the following statement at Paragraph 194:

"The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

2.3.7 The NPPF is supported by Air Quality national Planning Practice Guidance (nPPG) (Department for Levelling Up, Housing and Communities, 2019). The nPPG states that:

"The Department for Environment, Food and Rural Affairs carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with relevant Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified." (Paragraph 001 Reference ID: 32-001-20191101)

2.3.8 The nPPG goes on to state that:

"Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity." Paragraph: 003 Reference ID: 32-003-20191101

2.3.9 The nPPG also sets out the information that may be required in an air quality assessment, stating that:

"Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific." 007 Reference ID: 32-007-20191101

2.3.10 It also provides guidance on options for mitigating air quality impacts, and makes clear that:

"Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact." Paragraph: 008 Reference ID: 32-008-20191101

2.3.11 The nPPG makes clear that:

"… dust can also be a planning concern, for example, because of the effect on local amenity." Paragraph: 001 Reference ID: 32-001-20191101

2.3.12 National Policy Statement (NPS) EN-1 includes Paragraph 5.2.1, which states that (Department for Energy Security and Net Zero, 2024)

"Energy infrastructure development can have adverse effects on air quality. The construction, operation and decommissioning phases can involve emissions to air which could lead to adverse impacts on health, on protected species and habitats, or on the wider countryside and species."

2.3.13 At Paragraph 5.2.8, NPS EN-1 also states that *"where the project is like 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"*.

2.3.14 At Paragraph 5.2.9, NPS EN-1 states:

"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."*

2.3.15 NPS EN-1 says (in 5.2.16) 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.. "

2.3.16 There is no mention of air quality in the designated NPS EN-3 in relation to solar development. There is no mention of air quality in the designated NPS EN-5.

Local Policies

2.3.17 One of the Strategic Objectives of the South Derbyshire Local Plan states (South Derbyshire District Council, 2016):

"To ensure future development is locally distinctive and environmentally, socially and economically sustainable through the achievement of design excellence, addressing the causes and effects of climate change and reducing waste and pollution."

2.3.18 The South Derbyshire Local Plan includes Policy SD1 Amenity and Environmental Quality, which states:

"A The Council will support development that does not lead to adverse impacts on the environment or amenity of existing and future occupiers within or around proposed developments.

B The Council will take into consideration the following:

i) The potential for development to affect surface and ground water quality and its potential to affect the long term delivery of water quality standards set out in the Water Framework Directive or Habitats Directive.

ii) The potential for development to affect designated Air Quality Management Areas (AQMAs).

iii) The need for a strategic buffer between conflicting land uses such that they do not disadvantage each other in respect of amenity issues, such as odours, fumes, or dust and other disturbance such as noise, vibration, light or shadow flicker."

3 Methodology

3.1. Existing Conditions

3.1.1 Information on existing air quality within the study area has been collated from the following sources:

- The results of monitoring and the most recent publicly available Air Quality Annual Status Report (ASR) published by South Derbyshire District Council (South Derbyshire District Council, 2022);
- Background pollutant concentration maps published by Defra (Defra, 2023c).

3.2. Construction Impacts

3.2.1 A construction dust risk assessment has been undertaken following the methodology in the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2023).

3.2.2 The guidance divides activities on construction sites into four main types: demolition, earthworks, construction and trackout. The methodology is based on a sequence of steps. Step 1 screens the requirement for more detailed assessment; if there are no receptors within 250m of the site boundary, or within 50m of roads used by construction vehicles up to 250m from the site entrance, then there is no need for further assessment. Step 2 assesses the risk of dust impacts from each of the four activities, considering the scale and magnitude of the works (Step 2A), and the sensitivity of the area (Step 2B), which are combined at Step 2C to give the risk of dust impacts. Step 3 is to determine site-specific mitigation for each of the four activities based on the dust risk category defined at Step 2C. **Appendix A1** sets out the construction dust assessment methodology in more detail.

3.2.3 The IAQM construction dust assessment methodology ensures that, with appropriate mitigation in place, the residual effect from construction dust will normally be 'not significant'. Therefore, the assessment has been used to determine an appropriate level of mitigation for the construction phase.

3.3. Road Traffic Impacts

Health

3.3.1 Guidance for air quality and planning officers within local authorities, and developers and consultants involved in air quality assessments, has been published by Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) in Land-Use Planning & Development Control: Planning for Air Quality (EPUK and IAQM, 2017). . The guidance sets out criteria to help establish when an air quality assessment of impacts on health is likely to be considered necessary.

3.3.2 For impacts of existing air quality in new development, the requirement for an assessment should be based on professional judgement, taking into account:

- the background and future baseline air quality and whether this will be likely to approach or exceed the values set by air quality objectives;

- the presence and location of Air Quality Management Areas as an indicator of local hotspots where the air quality objectives may be exceeded;
- the presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular NO_2), that would cause unacceptably high exposure for users of the new development; and
- the presence of a source of odour and/or dust that may affect amenity for future occupants of the development.

3.3.3 For impacts of development on the local area, a two-stage approach is suggested, with the first stage intended to screen out small developments, and developments considered likely to have insignificant air quality effects. The full criteria are shown in **Appendix A1**.

3.3.4 A qualitative assessment of the air quality impacts associated with the development has been undertaken based on the scale of the development, the distance of the development from emissions sources and the existing air quality. The criteria in the EPUK/IAQM guidance and professional judgement have been used to screen the requirement for a full air quality assessment, with the professional experience of the consultant preparing this report set out in **Appendix A3**.

4 Baseline Conditions

4.1. LAQM Review and Assessment

4.1.1 No AQMAs have been declared by South Derbyshire District Council; therefore, it is highly unlikely concentrations of NO_2, PM_{10} or $PM_{2.5}$ exceed the objectives at any location where there is relevant exposure in South Derbyshire.

4.2. Local Air Quality Monitoring

4.2.1 No automatic monitoring has been undertaken by South Derbyshire District Council; however, an NO_2 diffusion tube monitoring network does operate. Data from monitoring sites located within 5km of the application site are shown in **Table 2**, with the monitoring locations shown in **Figure 1**.

4.2.2 No exceedances of the annual mean NO_2 objective have been measured between 2017 and 2021 and concentrations ranged between 9.2-35.4 µg/m^3.

4.2.3 Concentrations measured in 2020 and 2021 would have been affected by travel restrictions brought in to control the Covid-19 epidemic and may not be representative of usual conditions.

4.3. Background Concentrations

4.3.1 Estimated background concentrations at the application site, obtained from the national maps published by Defra, are shown in **Table 3**. The background concentrations are well below the objectives/standards.

Table 2: Measured Annual Mean NO_2 Concentrations

ID in Figure 1	Location	Type [a]	Annual Mean (µg/m^3)				
			2017	2018	2019	2020	2021
SDDC3	Community Centre	UB	15.5	12.3	11.3	9.2	9.6
SDDC7	Lullington Road	R	28.0	26.0	23.3	19.8	19.9
SDDC8	Lullington Road	R	28.9	25.2	23.5	19.8	22.1
SDDC9	Woodland Road	R	30.7	32.9	32.3	24.8	26.1
SDDC10	Burton Road	K	35.4	31.8	29.0	24.8	27.7
SDDC19	Church Street	R	28.3	20.7	20.7	17.0	17.4
Objective			**40**				

a UB = Urban Background, R = Roadside, K = Kerbside.

Table 3: Estimated Annual Mean Background Concentrations (µg/m^3)

Year	NO_2	PM_{10}	$PM_{2.5}$
2023	7.0-10.3	11.1-13.1	7.1-7.5
Objective/Standard	**40**	**40**	**20**

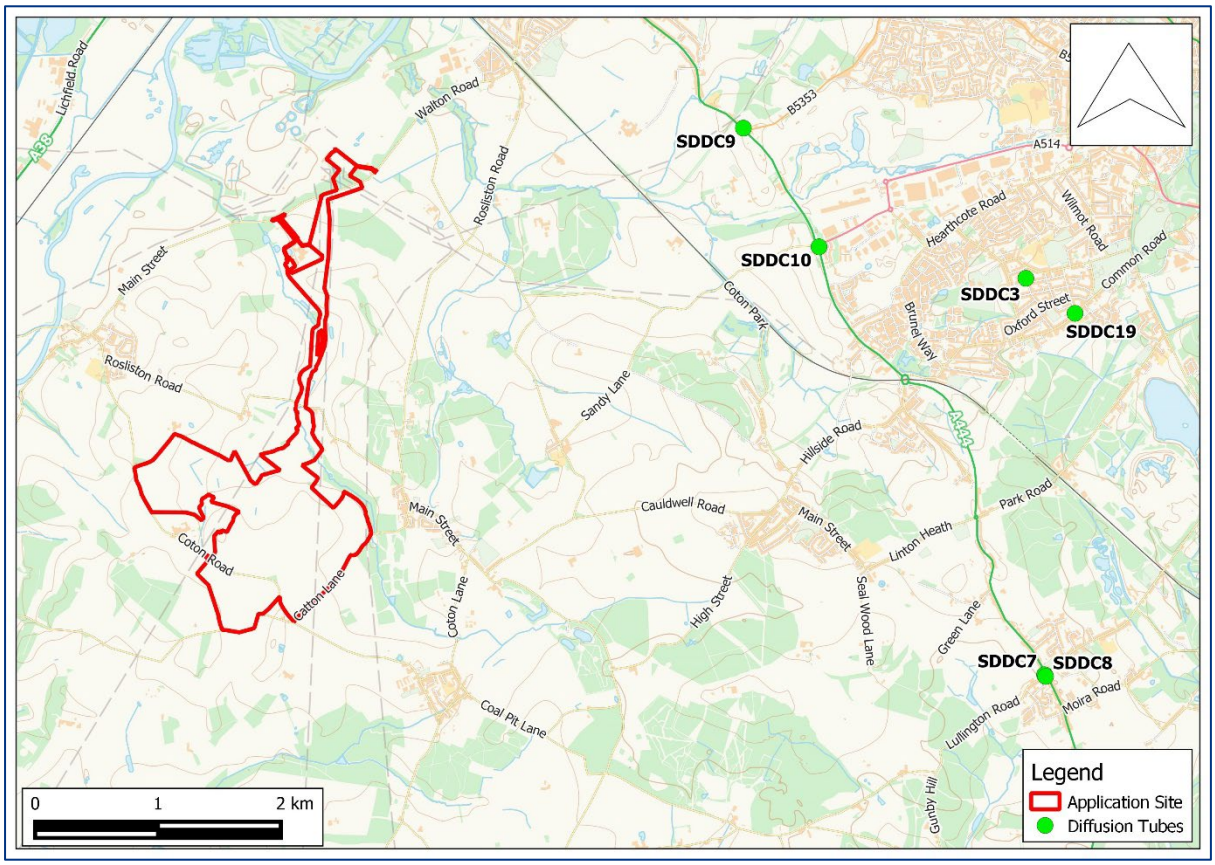

Figure 1: Application Site and Air Quality Monitoring Sites
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5 Air Quality Assessment

5.1. Construction Phase

5.1.1 Without mitigation, there is a risk that the construction phase of the development will lead to dust soiling and elevated concentrations of PM_{10}. These impacts may occur during demolition, earthworks and construction, as well as from track-out of dust onto the public highway, as vehicles leave the construction site.

5.1.2 There are no sensitive ecological receptors within 50m of construction activities and the effects of construction on ecology will not be considered further.

Risk of Dust Impacts

Potential Dust Emission Magnitude

5.1.3 There will be no demolition at the application site; therefore, the impacts due to dust during demolition will not be considered further.

5.1.4 The total area of development is approximately 192ha; however, any disturbance of the soil during installation of the solar panels, which would cover most of this area, would be minimal. Some earthworks would be required during the preparation of the land for the access roads, substation and battery infrastructure and the total area affected would be around 93,000 m^2. Based on the example definitions in **Table A1** of **Appendix A1**, the dust emission class for earthworks is considered to be medium.

5.1.5 The substation would be the only building constructed, with a volume of around 270 m^3. The installation of the solar panels and battery infrastructure would not lead to any dust emissions. Based on the example definitions in **Table A1** of **Appendix A1**, the dust emission class for construction is considered to be small.

5.1.6 The maximum number of daily outward heavy duty vehicle (HDV) movements from the application site during the construction phase will occur during month four, when there will be 14 daily HDV movements from the site; therefore, based on the example definitions in **Table A1** of **Appendix A1**, the dust emission class for trackout is considered to be small.

5.1.7 A summary of the likely dust emission magnitudes is shown in **Table 4**.

Table 4: Likely Dust Emission Magnitudes

Source	Dust Emission Magnitude
Demolition	n/a
Earthworks	Medium
Construction	Small
Trackout	Small

Sensitivity of the Area

5.1.8 The sensitivity of the area depends on the specific sensitivities of local receptors, the proximity and number of receptors, local PM_{10} background concentrations and other site specific factors, e.g. natural screening by trees.

Sensitivity of the Area to Dust Soiling

5.1.9 There are no dust sensitive receptors located within 100m of any of the works that may lead to dust emissions, i.e., the earthworks associated with the access roads, substation and battery infrastructure and the construction of the substation. Therefore, with reference to **Table A5** of **Appendix A1**, the area is thus considered to be of low sensitivity to dust soiling from on-site works.

5.1.10 The dust emission magnitude for trackout is small, therefore there is a risk of material being tracked up to 50m from the site exits. Construction vehicles would be likely to use the access roads constructed for the proposed development. There are no receptors within 20m of the road up to 50m from the proposed site access roads; therefore, with reference to **Table A5** of **Appendix A1**, the area is considered to be of low sensitivity to dust soiling from trackout.

Sensitivity of the Area to the Health Effects of PM_{10}

5.1.11 Residential properties are considered to be high sensitivity receptors to the health effects of PM_{10} see **Table A3** of **Appendix A1**). Annual average PM_{10} concentrations at receptors that may be affected by PM_{10} emissions during construction would be close to background levels (11.1-13.1µg/m^3), and significantly less than 24µg/m^3; therefore, with reference to **Table A6** of **Appendix A1**, the area is considered to be of low sensitivity to the health effects of PM_{10} during on-site works and from trackout.

5.1.12 A summary of the sensitivity of the area to the effects of the construction works is shown in **Table 5**.

Table 5: Summary of the Area Sensitivity

Potential Effect	Sensitivity of the Area	
	On-site Works	Trackout
Dust Soiling	Low	Low
Health	Low	Low

Risk of Impact and Significance

5.1.13 The dust emission magnitudes in **Table 4** have been combined with the area sensitivities in **Table 5** and a risk category has been assigned to each construction activity using the matrix in **Table A8** of **Appendix A1.** The resultant risk categories, shown in **Table 6**, have then been used to determine the appropriate level of mitigation necessary for a residual effect that is likely to be 'not significant'.

Table 6: Summary of the Risk of Impacts Without Mitigation

Construction Activity	Dust Soiling	Health
Demolition	n/a	n/a
Earthworks	Low	Low
Construction	Negligible	Negligible
Trackout	Negligible	Negligible

Transport Emissions

5.1.14 The average daily traffic generated during the construction phase has been estimated by Royal HaskoningDHV, the Transport Consultants supporting the planning application for the proposed development. It has been estimated that the construction phase would result in maximum annual average daily trips (AADT) of 14 heavy duty vehicles and 67 light duty vehicles. Therefore, with regard to the screening criteria in **Appendix A1** for areas outside an AQMA, the health impacts due to emissions from construction phase transport emissions would be insignificant.

5.2. Operational Phase

Impact of the Development

5.2.1 Once the proposed development is operational, no more than around 2-3 visits per day would be required for maintenance, i.e., around 6 daily light vehicle trips.

5.2.2 The increase in traffic is significantly less than the 500 AADT light vehicle screening criteria for areas outside an AQMA, as set out in **Appendix A1**; therefore, detailed assessment of the air quality impacts of the development on the surrounding area should not be required and the impacts will be insignificant.

Impact on the Development

5.2.3 There would be no relevant exposure to the air quality objectives at the application site and an assessment of the air quality effects at the site is not required.

6 Mitigation

6.1. Construction Phase

6.1.1 The application site has been identified as a negligible to low risk site for dust soiling and health effects during the construction phase, as set out in **Table 6**. The dust risk category has been used, along with the professional judgement of the consultant, to determine the appropriate level of mitigation at the site. The mitigation measures, taken from the IAQM guidance, are described in **Appendix A4**.

6.2. Operational Phase

6.2.1 The screening assessment has shown that the air quality impacts will be insignificant. Mitigation measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions standards, largely via European legislation. Therefore, it is not considered appropriate to propose further mitigation measures for this scheme.

7 Residual Impacts

7.1. Construction Phase

7.1.1 The IAQM guidance is clear that, with appropriate mitigation in place, the residual effect will normally be 'not significant'. With the implementation of the mitigation measures set out in **Appendix A4**, the residual effects are judged to be insignificant.

7.1.2 During adverse weather conditions, or where there is an interruption to the water supply, there may be occasional, short-term dust annoyance; however, the likely scale and duration of these effects would not change the conclusion that the residual effects are insignificant.

7.2. Operational Phase

7.2.1 The residual impacts will be the same as those identified in **Section 5**.

8 Conclusions

8.1.1 The air quality impacts associated with the construction and operation of the Oaklands Farm Solar Park have been assessed.

8.1.2 The construction phase will have the potential to create dust. It will therefore be necessary to implement mitigation measures to minimise dust emission. With these measures in place, it is expected that any residual effects will be insignificant.

8.1.3 The development will not increase traffic above the level of the IAQM/EPUK screening criteria during the construction or operational phase; therefore, detailed air quality assessment should not be necessary, and the development will have an insignificant effect on local air quality due to vehicle emissions.

8.1.4 There will be no relevant exposure to the air quality objectives at the development.

8.1.5 The air quality effects of the proposed development have been assessed and found to be insignificant. Therefore, with regards air quality, there should be no constraints to the development of the application site for the proposed use as the development is consistent with the relevant parts of:

- the NPPF and Air Quality PPG;
- NPS EN-1; and
- Policy SD1 of the South Derbyshire Local Plan.

9 References

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10 Appendices

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A1 Construction Dust Assessment Methodology

A1.1.1 The IAQM guidance divides activities on construction sites into four types to reflect their different potential impacts:

- demolition;
- earthworks;
- construction; and
- trackout.

A1.1.2 A series of steps then consider the potential impact due to:

- annoyance due to dust soiling;
- the risk of health effects due to increased exposure to PM_{10}; and
- harm to ecological receptors.

A1.2. Step 1: Screen the Need for a Detailed Assessment

A1.2.1 An assessment is required where there is a human receptor within 250 m of the site boundary, and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s), or where there is an ecological receptor within 50 m of the site boundary, and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

A1.2.2 Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is negligible, and any effects will be not significant.

A1.3. Step 2: Assess the Risk of Dust Impacts

A1.3.1 A site is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emissions magnitude (Step 2A); and
- the sensitivity of the area to dust impacts (Step 2B).

A1.3.2 These two factors are combined at Step 2C to determine the risk of dust impacts from each type of construction activity, with no mitigation applied.

Step 2A: Potential Dust Emissions Magnitude

A1.3.3 The dust emission magnitude is classified as small, medium or large. Examples of how the potential dust emission magnitude for each activity can be defined are shown in **Table A1**.

Table A1: Examples of How the Dust Emission Magnitude can be Defined

Class	Example
Demolition	
Large	Total building volume >75,000m^3, potentially dusty construction material (e.g. concrete), 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 6-12m above ground level.
Small	Total building volume <12,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6m above ground, demolition during wetter months.
Earthworks	
Large	Total site area >110,000m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry to due small particle size), >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.
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 <4m in height.
Construction	
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.
Small	Total building volume <12,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).
Trackout [a]	
Large	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m.
Medium	20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m.
Small	<20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

a These numbers are for vehicles that leave the site after moving over unpaved ground.

Step 2B: Define the Sensitivity of the Area

A1.3.4 The sensitivity of the area takes account of:

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

A1.3.5 The specific sensitivities of different types of receptor to dust soiling and PM_{10} are shown **Table A2**, **Table A3** and **Table A4**. Professional judgement should be used to identify where on the spectrum of sensitivity a receptor lies, taking account of specific circumstances, i.e. the first occupants of residential units on a phased development may be expected to be less sensitive to dust soiling.

A1.3.6 The sensitivity of the area is then determined from the specific sensitivities of the receptors using the matrices set out in **Table A5**, **Table A6** and **Table A7**.

A1.3.7 Professional judgement should be used to determine the final sensitivity of the area, taking account of:

- any history of dust generating activities in the area:
- the likelihood of concurrent dust generating activity on nearby sites;
- any pre-existing screening between source and receptors;
- any conclusions drawn from analysing local meteorological data which accurately represents the area; and if relevant, the season during which the works will take place;
- any conclusions drawn from local topography;
- duration of the potential impact, as a receptor may become more sensitive over time; and
- any other known specific receptor sensitivities.

Step 2C: Define the Risk of Impacts

A1.3.8 The dust emission magnitude determined at Step 2A is combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts with no mitigation applied. The level of risk for each activity is determined using the matrix in **Table A8**.

A1.4. Step 3: Determine Site Specific Mitigation

A1.4.1 The dust risk category determined at Step 2C has been used, along with the professional judgement of the consultant, to determine the appropriate level of mitigation at the site. The highly recommended and desirable mitigation measures set out in the IAQM guidance form the basis of the mitigation set out in **Appendix A4**.

A1.5. Step 4: Determine Significant Effects

A1.5.1 The IAQM guidance is clear that, with appropriate mitigation in place, the residual effect will normally be ‘not significant’.

Table A2: Sensitivities of People to Dust Soiling

Class	Principles	Examples
High	Users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected a to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.	Dwellings, museum and other culturally important collections, medium and long term car parks and car showrooms.
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; or the appearance, aesthetics or value of their property could be diminished by soiling; or 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.	Parks and places of work.
Low	The enjoyment of amenity would not reasonably be expected; or property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or 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.	Playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.

Table A3: Sensitivities of People to PM_{10}

Class	Principles	Examples
High	Locations where members of the public may be exposed for eight hours or more in a day.	Residential properties, hospitals, schools and residential care homes.
Medium	Locations where the people exposed are workers, and where individuals may be exposed for eight hours or more in a day.	Office and shop workers, but will generally not include workers occupationally exposed to PM_{10}
Low	Locations where human exposure is transient.	Public footpaths, playing fields, parks and shopping streets.

Table A4: Sensitivities of Receptors to Ecological Effects

Class	Principles	Examples
High	Locations with an international or national designation and the designated features may be affected by dust soiling; or 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.	Special Areas of Conservation (SAC) designated for acid heathlands or local site designated for lichens adjacent toa the demolition of a large site containing concrete (alkali) buildings.
Medium	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition.	Sites of Special Scientific Interest (SSSI) with dust sensitive features.
Low	Locations with a local designation where the features may be affected by dust deposition.	Local Nature Reserves with dust sensitive features.

Table A5: Sensitivity of the Area to Dust Soiling Effects on People and Property [1]

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	**>100**	High	High	Low	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 A6: Sensitivity of the Area to Human Health Effects [1]

Receptor Sensitivity	Annual Mean PM_{10}	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	**>32 µg/m³**	**>100**	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m³	**>100**	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m³	**>100**	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m³	**>100**	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	**>32 µg/m³**	**>10**	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
		>10	Medium	Low	Low	Low	Low

[1] For demolition, earthworks and construction, the distances are measured from the dust source, or the application site boundary. For trackout, the distances are measured from the side of the roads used by construction traffic. Without site-specific mitigation, trackout may occur from roads up to 500 m from large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge or the road.

	28-32 µg/m³	**1-10**	Low	Low	Low	Low	Low
	<28 µg/m³	**≥1**	Low	Low	Low	Low	Low
Low	**-**	**≥1**	Low	Low	Low	Low	Low

Table A7: Sensitivity of the Area to Ecological Effects [1]

Receptor Sensitivity	**Distance from the Source (m)**	
	<20	**<50**
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Table A8: Defining the Risk of Dust Impacts

Sensitivity of the Area	**Dust Emission Magnitude**		
	Large	**Medium**	**Small**
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Earthworks			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

A2 Criteria Used to Establish when an Air Quality Assessment is Likely to be Necessary

A2.1.1 Criteria to Proceed to Stage 2.

A. If any of the following apply:

- 10 or more residential units or a site area of more than 0.5ha;
- more than 1,000 m^2 of floor space for all other uses or a site area greater than 1ha

B. Coupled with any of the following:

- the development has more than 10 parking spaces
- the development will have a centralised energy facility or other centralised combustion process

Note: Consideration should still be given to the potential impacts of neighbouring sources on the site, even if an assessment of impacts of the development on the surrounding area is screened out.

A2.1.2 The Stage 2 criteria are shown in **Table A9**.

Table A9: Indicative Criteria for Requiring an Air Quality Assessment

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans <3.5t gross vehicle weight)	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA; - more than 500 AADT elsewhere.
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight)	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA; - more than 100 AADT elsewhere.
3. Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA.
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
5. Introduce or change a bus station.	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA; - more than 100 AADT elsewhere.

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20 m of a relevant receptor; coupled with the car park having more than 100 movements per day (total in and out).
7. Have one or more substantial combustion processes	Where the combustion unit is: - any centralised plant using bio fuel; - any combustion plant with single or combined thermal input>300kW; - a standby emergency generator associated with a centralised energy centre (if likely to be tested/used >18 hours a year).
8. Have a combustion process of any size	Where the pollutants are exhausted from a vent or stack in a location and at a height that may give rise to impacts at receptors through insufficient dispersion. This criterion is intended to address those situations where a new development may be close to other buildings that could be residential and/or which could adversely affect the plume's dispersion by way of their size and/or height.

A3 Professional Experience

Bob Thomas, BSc (Hons) PgDip MSc MIEnvSc MIAQM CSci

Bob Thomas is a Director at AQA, with over twenty years working in the sciences and sixteen years' experience in the field of air quality management and assessment. He has carried out air quality assessments for a wide range of developments, including residential, commercial, industrial, minerals and waste developments. He has been responsible for air quality projects that include ambient air quality monitoring of nitrogen dioxide, dust and PM_{10}, the assessment of nuisance odours and dust, and the preparation of Review and Assessment reports for local authorities. He has extensive dispersion modelling experience for road traffic, energy centre and industrial sources, and has completed many stand-alone reports and chapters for inclusion within an Environmental Statement. Bob has worked with a variety of clients to provide expert air quality services and advice, including local authorities, planners, developers, architects and process operators, and has provided expert witness services at public inquiry. He is a Chartered Scientist, a Member of the Institute of Air Quality Management and a Member of the Institution of Environmental Sciences.

A full CV for Bob Thomas is available at http://aqassessments.co.uk/about

A4 Construction Mitigation

A4.1.1 The following is a set of measures that should be incorporated into the specification for the works.

A4.2. Communications

- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environmental manager/engineer or the site manager; and
- display the head or regional office contact information.

A4.3. 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 authority when asked; and
- 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 log book.

A4.4. Monitoring

- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Authority when asked; and
- 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 area being carried out and during prolonged dry or windy conditions.

A4.5. Preparing and Maintaining the Site

- Plan the site layout so that machinery and dust-causing activities are located away from receptors, as far as is possible;
- erect solid screens or barriers around dusty activities or the site boundary that are as at least as high as any stockpiles on site; and
- avoid site runoff of water or mud.

A4.6. Operating Vehicle/Machinery and Sustainable Travel

- Ensure all vehicles switch off their engines when stationary – no idling vehicles; and
- avoid the use of diesel- or petrol-powered generators and use mains electricity or battery-powered equipment where practicable.

A4.7. 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, conveyors and covered skips; and
- minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

A4.8. Waste Management

- No bonfires and burning of waste materials.