SUNNICA ENERGY FARM

Preliminary Environmental Information Report

Chapter 14: Air Quality

Sunnica Ltd

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Contents

Tables

14. Air Quality

14.1 Introduction

14.1.1 The purpose of this PEI Report is to report on the findings of an assessment of the likely significant effects on local air quality as a result of the Scheme. A study area comprising the DCO Site and the affected road network has been assessed. Sensitive receptors within 350m of the DCO Site boundary, and within 50m of the roads expected to be affected by the construction phase traffic, and up to 500m from the site access points, have been considered, following guidance from the Institute of Air Quality Management (IAQM) (Ref 14-23).

14.1.2 The assessment relates to dust generation, and additional road traffic and plant emissions during the construction phase. The potential for operational impacts is also addressed. The decommissioning phase will be similar in nature, duration, and extent to the construction phase, albeit likely to be shorter and of lower magnitude due to the small amount of decommissioning required; it has therefore not been necessary to separately assess this phase and the effects for assessment purposes are assumed on a conservative basis to therefore be the same as the construction phase.

14.1.3 The potential impact of the Scheme on local air quality will be determined at sensitive receptors (human and ecological) which have been identified in the vicinity of the DCO Site.

14.2 Relevant Legislation, Guidelines and Policy

Relevant Legislation, Guidelines and Policy – National

European Air Quality Directives

14.2.1 The Clean Air for Europe (CAFE) programme revisited the management of Air Quality within the EU and replaced much of the existing air quality legislation with a single Directive, Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe (Ref 14-5; Ref 14-6). This Directive repealed and replaced the EU Framework Directive 96/62/EC on Ambient Air Quality Assessment and Management (Ref 14-7) and its associated Daughter Directives 1999/30/EC (Ref 14-8), 2000/69/EC (Ref 14-9) 2002/3/EC (Ref 14-10) (relating to limit values for ambient air pollutants) and the Council Decision 97/101/EC (Ref 14-11) which established a reciprocal exchange of information and data within Member States.

Directive 2008/50/EC is currently transcribed into UK legislation by the Air Quality Standards Regulations 2010 (and subsequent amended regulations) which came into force on 11th June 2010 (Ref 14-12; Ref 14-13). This sets binding limit values or objectives on pollutants with the aim of avoiding, preventing or reducing harmful effects on human health and on the environment as a whole.

Air Quality Standards Regulations 2010 (and amendments)

14.2.2 The pollutants of concern for this assessment are particulate matter (PM_{10} and $PM_{2.5}$) and nitrogen dioxide (NO_2). Pollutant standards relate to health-

based ambient pollutant concentrations in the air. Objectives incorporate target dates (all of which have now passed). Table 14.1 sets out the UK Air Quality Objectives.

Table 14.1: Air Quality Objectives

Pollutant	*Objective*	*Averaging Period*	*Not to be Exceeded More Than*
Nitrogen dioxide (NO_2)	200	1 hour	18 times per year (i.e. 99.79th percentile)
	40	Annual	Not applicable
Particulate matter (PM_{10})	40	Annual	Not applicable
	50	24 hour	35 times per year (i.e. 90.4th percentile)
Particulate matter ($PM_{2.5}$)	25	Annual	Not applicable

Local Air Quality Management

14.2.3 The provisions of Part IV of the Environment Act 1995 establish a national framework for air quality management, which requires all local authorities in England, Scotland and Wales to conduct local air quality reviews. Section 82(1) of the Act requires these reviews to include an assessment of the current air quality in the area and the predicted air quality in future years. The Environment Act 1995 also outlines measures to be taken by local planning authorities in relation to meeting the standards and objectives. Should the reviews indicate that the objectives prescribed in the UK Air Quality Strategy (AQS) (Ref 14-1) and the Air Quality (England) Regulations (Ref 14-2; Ref 14-3) will not be met, the local authority is required to designate an Air Quality Management Area (AQMA). Action must then be taken at a local level to ensure that air quality in the area improves. This process is known as 'local air quality management' or LAQM.

UK Air Quality Strategy

14.2.4 The UK AQS (Ref 14-1) identifies nine ambient air pollutants that have the potential to cause harm to human health and two for the protection of vegetation and ecosystems. The Strategy defines objectives for these pollutants that aim to reduce the impacts of these pollutants to negligible levels. The objectives are not mandatory but rather targets that local authorities should try to achieve.

The Department for Environment, Food and Rural Affairs (Defra) Clean Air Strategy 2019

14.2.5 In 2019, the UK government released its Clean Air Strategy 2019 (Ref 14-4) part of its 25 Year Environment Plan.

14.2.6 LAQM focus in recent years has primarily related to nitrogen dioxide (NO_2), and its principal source in the UK, road traffic. However, the 2019 Strategy broadens the focus to other areas, including domestic emissions from wood burning stoves and from agriculture. This shift in emphasis is part of a goal to reduce the levels of fine particulate matter ($PM_{2.5}$) in the air to below the World Health Organisation guideline level; lower than the current objective.

National Planning Policy

14.2.7 As outlined in **Section 1.3** of ***Chapter 1: Introduction***, the EIA for the Scheme must have regard to the relevant policies of the NPPF and relevant NPSs. Key aspects of the NPPF and relevant NPSs, which have been considered during the development of this chapter, are outlined below

- NPS EN-1, with particular reference to Section 5.2 and Paragraphs 5.2.6 to 5.2.13, in relation to the assessment of air quality and potential mitigation; and
- NPPF (Ref 14-14) with particular reference to paragraph 170 which considers air quality to be an important element of the natural environment. 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 …" and Paragraph 181 which expects planning policies and decisions to 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.

Planning Practice Guidance (2018)

14.2.8 The Planning Practice Guidance (PPG) (Ref 14-15) was published on the 6th March 2014 to provide more in-depth guidance to the NPPF. The PPG aims to make planning guidance more accessible, and to ensure that the guidance is kept up to date. As such, the PPG was amended in July 2017 to reflect the updated EIA Regulations, and subsequently revised again in 2018.

14.2.9 The PPG notes that the air quality assessment should include the following information (paragraph 5):

- The existing air quality in the study area (existing baseline);
- The future air quality without the Scheme in place (future baseline); and
- The future air quality with the Scheme in place (with mitigation).

14.2.10 Paragraph 7 states 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 assessments are likely to be location specific. The scope and content of supporting information is best discussed and agreed between the local planning authority and applicant before it is commissioned.

14.2.11 The guidance also advises that the application should proceed to decision with appropriate planning conditions or planning obligations if the Proposed Development (with mitigation) would not lead to an unacceptable risk from air pollution, prevent sustained compliance with EU limit values or fail to comply with the regulation of the Conservation of Habitats and Species Regulations 2010 (Ref 14-16).

Local Planning Policy

- East Cambridgeshire District Local Plan Adopted April 2015, with particular reference to Policy ENV 9: Pollution;
- East Cambridgeshire District Council SPD Renewable Energy Development (Commercial Scale) October 2014 with reference to protecting residential amenity;
- Forest Heath and St Edmundsbury Councils: Joint Development Management Policies Document (last updated February 2015) (Ref 14-19) with particular reference to DM14: Protecting and Enhancing Natural Resources, Minimising Pollution and Safeguarding from Hazards; and
- Forest Heath District Council Core Strategy (2010) (Ref 14-20) with particular reference to Policy CS4: Reduce Emissions, Mitigate and Adapt to future Climate Change which indicates a requirement for development proposals to deliver high levels of sustainability in order to avoid expansion of the district's ecological footprint.

14.2.12 These policies further cement the need to ensure developments do not harm, and indeed actively enhance air quality where possible.

Other Relevant Guidance

Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) Planning Guidance

14.2.13 When determining the significance of the air quality assessment results with the Scheme, this assessment follows the non-statutory best practice guidance relating to air quality and development control published by Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) (Ref 14-23). The guidance ensures that air quality is adequately considered during land-use planning and development control process and is applicable to assessing the effect of changes in exposure of members of the public consequential to residential and mixed-use developments. This is of particular importance in urban areas where air quality is of a poorer standard. The guidance states that:

"Land-use planning can play a critical role in improving local air quality. At the strategic level, spatial planning can provide for more sustainable transport links between the home, workplace, educational, retail and leisure facilities, and identify appropriate areas for potentially polluting industrial development. For an individual development proposal, there may be associated emissions from transport or combustion processes providing heat and power."

14.3 Assessment Methodology

Introduction

14.3.1 There is currently no statutory guidance on the methodology for air quality impact assessments. Several non-statutory bodies have published their own guidance relating to air quality and development control, such as that by EPUK and the IAQM (Ref 14-23). This assessment has been carried out in accordance with on this guidance.

14.3.2 This section details the methods used to assess the potential effects on air quality during the construction and operational phases of the Scheme.

14.3.3 The potential for fugitive emissions of particulate matter from construction-phase activities has been qualitatively assessed via a Dust Risk Assessment in accordance with IAQM Guidance (Ref 14-23). Construction-phase road traffic emissions will be quantitatively assessed via a detailed dispersion modelling exercise as part of the Environmental Impact Assessment and reported within the Environmental Statement.

14.3.4 Due to the nature of the Scheme, there are anticipated to be very few trips generated, therefore a significant change to traffic flows is not anticipated to occur once the Scheme is complete and operational. A detailed assessment of emissions from operational road traffic and the subsequent impact upon local air quality is therefore not required and will not be considered further within this assessment for the operational stage.

Study Area

14.3.5 The study area for this assessment is the area up to 350m from the site boundary, following IAQM guidance (Ref 14-23).

Methodology for Assessment of Fugitive Emissions of Particulate Matter during Construction Phase

14.3.6 A qualitative risk-based assessment has been undertaken to assess the significance of any effects on sensitive receptors associated with the construction phase. The assessment is in accordance with on IAQM (Ref 14-23) guidance and considers potential sources of emissions on the basis of the four main activity groupings:

- Demolition (not relevant to this scheme);
- Earthworks (e.g. soil stripping, excavation etc.);
- Construction; and
- Track-out (movement of mud and soil out of the site by construction vehicles).

14.3.7 The emphasis within the guidance is on clarifying the risk of dust impacts from the DCO Site, which will allow mitigation measures commensurate with that risk to be identified.

14.3.8 For each activity group the following steps are applied with respect to identifying the potential effects, before coming to an overall conclusion about the significance of the effects predicted:

- Identification of receptors and their sensitivity;
- Identify the nature, duration and the location of activities being carried out;
- Establish the risk of significant effects occurring as a result of these activities (taking into magnitude of effect and receptor sensitivity);
- Review the proposed or embedded mitigation against good practice;
- Identify additional mitigation measures, if necessary, to reduce the risk of a significant adverse effect occurring at receptors; and,
- Summarise the overall effect of the works with respect to fugitive emissions of particulate matter and report the significance of the effects.

14.3.9 A 'Dust Risk Assessment' has been undertaken based on the IAQM guidance (Ref 14-23) and the findings are presented within the 'Dust Risk Assessment' section of this chapter. Construction of the Scheme will take place over a number of phases; however, the assessment has taken the whole site into consideration. As such, potential fugitive emissions may be lower than would be expected, as the works will be on a smaller scale than has been assumed by taking the site as a whole. As such the worst case has been assessed.

14.3.10 The Dust Risk Assessment has identified the DCO Site as being 'low to medium' risk for amenity and human health receptors, and 'high risk' for ecological receptors. The assessment outlines the appropriate level of mitigation required at the DCO Site to either avoid or to reduce potential effects to neighbouring sensitive receptors (property and amenity; human health; and designated ecological sites). Guidance states that the highest risk rating should be used for recommending mitigation measures, and as such those for a 'high risk' site will be recommended for implementation. These are presented in the 'Mitigation Measures' section below.

14.3.11 Assuming all mitigation measures will be effectively implemented at the level recommended by the Dust Risk Assessment taking the worst potential outcomes and conservative approach, no significant dust effects resulting from excavation and construction activities are anticipated beyond the DCO Site.

14.3.12 Identified measures will be set out in the Construction Environmental Management Plan (CEMP) for the Scheme, as set out in the Scoping Opinion. A Framework CEMP is included in ***PEI Report Volume 2: Appendix 16C***.

Methodology for Assessment of Construction Phase Non-Road Mobile Machinery Emissions (NRMM)

14.3.13 Emissions from construction Non-Road Mobile Machinery (NRMM) will have the potential to increase NO_2 and PM_{10} concentrations locally when in use during construction. Guidance states that experience of assessing the exhaust emissions from on-site plant (NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, therefore in the vast majority of cases they will not need to be quantitatively assessed (Ref 14-23). It is our professional opinion that this site does not require any unusual Plant that would deviate from the industry experience quoted above and require an assessment.

14.3.14 Emissions from NRMM will be temporary and localised and will be controlled through good-practice mitigation measures. For that reason, construction phase NRMM emissions will not be significant and, therefore, these emissions have not been modelled or are required to be considered any further in this assessment.

Methodology for Assessment of Construction Phase Road Traffic Emissions

14.3.15 The construction phase of the Scheme is likely to lead to a small increase in the number of vehicles on the local highway network for the duration of the construction works. EPUK (Ref 14-22) set out criteria to establish the need

for an air quality assessment for the construction phase of a development as being:

"Large, long-term construction sites that would generate large HGV flows (>200 per day) over a period of a year or more."

14.3.16 The maximum number of construction vehicles (including Light Duty Vehicles (LDVs) and Heavy Goods Vehicles (HGVs)) during the peak of construction will exceed 200 vehicles per day (anticipated to be over 200 HGV movements and over 500 LDV movements per day) and therefore has the potential to cause an adverse impact on air quality at nearby receptors. A detailed dispersion modelling exercise will therefore be carried out as part of the Environmental Impact Assessment (EIA) and reported in the Environmental Statement (ES) in order to quantitatively determine the potential impacts on ambient pollutant concentrations within the study area. The significance of these impacts will subsequently be assessed in accordance with EPUK and IAQM criteria.

14.3.17 Exhaust emissions from road vehicles may affect the concentrations of the principal pollutants of concern, NO_2, PM_{10} and $PM_{2.5}$, at sensitive receptors in the vicinity of the Scheme. Therefore, these pollutants will be the focus of the assessment of the significance of construction-phase road traffic impacts. Although SO_2, CO, benzene and 1,3-butadiene are also present in motor vehicle exhaust emissions, detailed consideration of the associated impacts on local air quality is not considered relevant in the context of this proposal as none of these pollutants are at risk of exceeding the relevant objective values within the study area (based on Local Authority Air Quality Management work across the country).

14.3.18 The assessment will use the dispersion model software 'ADMS-Roads' (currently version 5.0.0.1) to quantify pollution levels at selected receptors due to road traffic emissions. ADMS-Roads is a modern dispersion model that has an extensive published track record of use in the UK for the assessment of local air quality impacts, including model validation and verification studies.

14.3.19 The model outputs will be presented at individual receptor locations rather than across a regular grid to provide a contour plot. This chosen approach will provide a better representation of the impact of the scheme as it will avoid the need to interpolate results between gridded points.

14.3.20 The following model conditions will be determined and will form the basis of the assessment:

- Surface roughness at source;
- Minimum Monin-Obukhov length (used to describe the effects of buoyancy on turbulent flows, particularly in the lower tenth of the atmospheric boundary layer.) for stable conditions;
- Terrain types;
- Emissions of NO_X, PM_{10} and $PM_{2.5}$;
- Emission factors (to be derived from the latest version of the Emissions Factor Toolkit (EFT) emission factor dataset);

- Receptor location (x, y coordinates, determined by GIS; z = various);
- Meteorological data (ADMS requires one year of hourly sequential meteorological observation data from a station which experiences meteorological conditions that are representative of those experienced within the air quality study area); and
- Receptors (facades of selected receptors only).

14.3.21 Background pollutant concentrations will be sourced from Defra's latest background maps.

14.3.22 Annual Average Daily Traffic (AADT) flows on the affected road network for the baseline, future baseline (without development), and construction scenarios will be obtained from the transport study.

14.3.23 The performance of the model will be assessed in order to identify any discrepancies between modelled and measured concentrations at air quality monitoring sites within the study area. This will be undertaken in accordance with the methodology described in Defra's technical guidance (LAQM.TG16) (Ref 14-24). The verification process will be supported by Defra's oxides of nitrogen to nitrogen dioxide (NO_X - NO_2) conversion tool to convert modelled NO_X from the road to NO_2 by taking into account the background concentrations.

14.3.24 Modelled predictions will therefore initially be made for annual mean NO_2 concentrations at the monitoring sites in order to compare monitored and modelled NO_2 concentrations. An adjustment factor will be calculated and applied to the modelled road NO_X concentrations at receptor locations. In the absence of appropriate particulate monitoring data for the baseline year of assessment (which would enable calculation of an adjustment factor for PM), the adjustment factor calculated for modelled road NO_X concentrations will also be applied to modelled concentrations of PM_{10} and $PM_{2.5}$ at all receptor locations. The accuracy of the adjusted model will be determined using the Route Mean Square Error (RMSE) calculation.

Information Sources

14.3.25 The following sources of information that define the Scheme have been reviewed and form the basis of the assessment of likely significant effects on air quality:

- Site Layout and Site Location Plans;
- Review of Defra Air Quality Background Concentration Maps;
- Examination of Local Authority Review and Assessment Reports.

Methodology for Determining Sensitive Receptors

14.3.26 Receptors of interest for the air quality assessment are those which represent locations where people are likely to be present as the assessment is most concerned with human health. The national air quality objective values for pollutants have been set at concentrations that provide protection to all members of society, including more vulnerable groups such as the very young, elderly or unwell. As such the sensitivity of receptors was accounted for in the definition of the air quality objective values and

therefore all receptors that represent exposure of the public are of equal sensitivity as any member of the public could be present at those locations.

14.3.27 Receptors to be considered against the annual mean objective will include public present in areas affected by regular exposure. This includes building facades of residential properties, schools, hospitals, care homes, etc. Receptors to be considered against the short-term objective include members of the public present in areas where the annual mean objective applies, but also areas with less regular exposure, such as any outdoor locations where the public might reasonably be expected to spend one hour or longer.

14.3.28 Sensitive receptors that have the potential to be affected by the Scheme have been considered for both the construction and operational phases. The methodology for determining sensitive receptors is described below.

Construction Phase Sensitive Receptors

14.3.29 For the purposes of the Dust Risk Assessment, potentially affected air quality sensitive receptors have been identified for the assessment through a review of OS mapping and aerial photography. The presence of sensitive ecological receptors holding a National or European designation within 50m of the DCO Site boundary, or within 50m from a route used by construction vehicles on the public highway (up to 500m from the Site access points) has also been established.

14.3.30 Based upon guidance for qualitatively assessing the risk of dust impacts from demolition and construction (Ref 14-23) a number of high sensitivity residential properties are to be included with regards to construction phase dust soiling and PM_{10} receptors.

14.3.31 The DCO Site has two primary access points, one in each of Sunnica East Site B and Sunnica West Site A, in addition to a number of secondary access points. Site construction traffic is therefore anticipated to use the existing road network within 500m of the Site entrance to access the Site.

14.3.32 For the purposes of the detailed dispersion modelling exercise, discrete receptors will be identified from OS mapping and aerial photography. Each discrete existing receptor selected for inclusion in the modelling assessment will represent the maximum level of exposure that could be experienced by other receptors in their vicinity and will therefore be considered sufficiently representative of them. As such the sensitivity of receptors was considered in the definition of the air quality objective values, and therefore, no additional subdivision of human health receptors on the basis of building or location type is necessary – this is recognised industry practice.

14.3.33 The potential air quality impacts on designated ecological sites within the study area will be modelled.

Methodology for Assessment of Significance

14.3.34 With regard to road traffic emissions, the change in pollutant concentrations relative to future baseline concentrations will be described at receptors that are representative of exposure to impacts on local air quality within the study area. The absolute magnitude of pollutant concentrations in the

'future baseline' and 'construction' scenario will also be described. This is used to consider the risk of the air quality limit values being exceeded in each scenario.

14.3.35 For consideration of a change in annual mean concentration of a given magnitude, the EPUK and IAQM have published recommendations for describing the effects of such impacts at individual receptors as set out in Table 14.2 and Table 14.3 below.

Table 14.2: Assessment of Significance for NO_2 and PM_{10}

Long Term Average Concentration at Receptor in Assessment Year ($\mu g/m^3$)	*Change in Concentration Relative to Air Quality Assessment Level (AQAL) – NO_2 and PM_{10} ($\mu g/m^3$)*				
	<0.2 (Imperceptible)	*0.2 - <0.6 (Very Small)*	*0.6 - <2.2 (Small)*	*2.2 -<4.0 (Medium)*	*>4.0 (Large)*
<30.2	Negligible	Negligible	Negligible	Minor	Moderate
30.2 - <37.8	Negligible	Negligible	Minor	Moderate	Moderate
37.8 - <41.0	Negligible	Minor	Moderate	Moderate	Substantial
41.0 - <43.8	Negligible	Moderate	Moderate	Substantial	Substantial
≥43.8	Negligible	Moderate	Substantial	Substantial	Substantial

Source: EPUK & IAQM (Ref 14-23)

Table 14.3: Assessment of Significance for $PM_{2.5}$

Long Term Average Concentration at Receptor in Assessment Year ($\mu g/m^3$)	*Change in Concentration Relative to Air Quality Assessment Level (AQAL) – $PM_{2.5}$ ($\mu g/m^3$)*				
	<0.1 (Imperceptible)	*0.1 - <0.4 (Very Small)*	*0.4 - <1.4 (Small)*	*1.4 -<=2.5 (Medium)*	*>2.5 (Large)*
<18.9	Negligible	Negligible	Negligible	Minor	Moderate
18.9 - <23.6	Negligible	Negligible	Minor	Moderate	Moderate
23.6 - <25.6	Negligible	Minor	Moderate	Moderate	Substantial
25.6 - <27.4	Negligible	Moderate	Moderate	Substantial	Substantial
≥27.4	Negligible	Moderate	Substantial	Substantial	Substantial

Source: EPUK & IAQM (Ref 14-23)

14.3.36 A change in predicted annual mean concentrations of NO_2 or PM_{10} of less than 0.2 $\mu g/m^3$ is considered to be so small as to be imperceptible. For short-term objectives, the guidance states that where the concentrations range from 11% - 20% of the relevant objective, the magnitude of impacts is small. Concentrations that are 21% - 50% and greater than 50% of the objectives have moderate or large impact respectively. A change (impact) that is imperceptible, given normal bounds of variation, would not be capable of having a direct effect on local air quality that could be considered to be significant.

14.3.37 The significance of the reported effects will then be considered for the Scheme in overall terms. The potential for the development to contribute to or interfere with the successful implementation of policies and strategies for the management of local air quality will be considered if relevant, but the principal focus will be any change to the likelihood of future achievement of

the air quality objective values, as set out in the 'Air Quality Criteria' section of this chapter, for the following pollutants:

- Annual mean nitrogen dioxide (NO_2) concentration of 40 µg/m^3;
- Annual mean particulate matter (PM_{10}) concentration of 40 µg/m^3;
- Annual mean fine particulate matter ($PM_{2.5}$) concentrations of 25 µg/m^3;
- 24-hour mean PM_{10} concentration of 50 µg/m^3 not to be exceeded on more than 35 times per year; and
- 1-hour mean NO_2 concentration of 200 µg/m^3 not to be exceeded on more than 18 times per year.

14.3.38 The achievement of local authority goals for local air quality management are directly linked to the achievement of the air quality objective values described above, and as such the assessment will focus on the likelihood of achievement of the air quality objective values as a result of the proposed scheme.

14.3.39 In terms of the significance of any adverse impacts, an effect will be reported as being either 'not significant' or as being 'significant'. If the overall effect of the Scheme on local air quality or on amenity is found to be 'moderate' or 'substantial' this is deemed to be 'significant'. Effects found to be 'minor' are considered to be 'not significant', although they may be a matter of local concern. 'Negligible' effects are considered to be 'not significant'.

14.4 Stakeholder Engagement

14.4.1 The comment received from the consultation is provided in Table 14.4.

Table 14.4 Key consultation responses to main matters on Air Quality

Consultee	*Matter raise*	*Response*
Planning Inspectorate	The Planning Inspectorate agrees that with suitable mitigation secured through a construction environmental management plan (CEMP), air quality as a topic in the ES can be scoped out. The Planning Inspectorate would, however, expect to see mitigation secured in a draft/ framework CEMP and that effort is made to agree with the relevant consultation bodies and submitted with the application. The CEMP should include measures explicitly, but not limited to, address impacts from dust during construction	Mitigation measures to be incorporated into the CEMP have been proposed following the completion of the Dust Risk Assessment. Generic mitigation measures for a high-risk site are presented in Table 14.7. Specific mitigation measures for each construction phase activity are outlined in Table 14.8.

14.5 Baseline Conditions

14.5.1 The air quality in the study area is generally good. There are no AQMAs in this region, and the Council does not monitor the air quality around the DCO Site as there are no concerns about air quality.

14.5.2 A scheme specific NO_2 diffusion tube monitoring survey will be undertaken to determine baseline pollutant concentrations within the study area. The results of this survey will be used to inform model verification. This survey is due to commence in September 2020.

Background Pollutant Concentrations

14.5.3 The total concentration of a pollutant comprises those contributions from explicit local emission sources such as roads, chimney-stacks, etc., and those that are transported into an area from indeterminate sources (e.g. by wind from further away). If all the explicit local sources were removed, all that would remain is that which comes from indeterminate sources; it is this component that is called 'background'. A good understanding of background concentrations is important when completing air quality assessments as it allows for a good understanding of local pollutant sources.

14.5.4 Background data for the relevant 1 km x 1 km grid squares (related to the study area) will be sourced from Defra Background Maps for the assessment years (to match the traffic data), which will include the worst case construction year (2023).

Baseline Dust Climate

14.5.5 A background level of dust exists in all urban and rural locations in the UK. Dust can be generated on a local scale from vehicle movements and from the action of wind on exposed soils and surfaces. Dust levels can be affected by long range transport of dust from distant sources into the local vicinity.

14.5.6 This baseline rate of soiling is considered normal (based on professional judgement) and varies dependent on prevailing climatic conditions. The tolerance of individuals to deposited dust is therefore shaped by their experience of baseline conditions.

14.5.7 Existing local sources of particulate matter includes wind-blown dust from exhaust emissions from energy plant and road vehicles, brake and tyre wear from road vehicles and the long-range transport of material from outside the study area.

14.6 Embedded Mitigation

14.6.1 Mitigation measures appropriate to the assessed level of risk of dust nuisance will be implemented as set out below. These are considered to be embedded mitigation, as they are required in order to ensure no off-site impacts from dust.

14.6.2 Mitigation may be required for road traffic emissions during construction, but this will be assessed at the EIA stage and set out in the Environmental Statement.

14.7 Assessment of Likely Impacts and Effects

Dust Risk Assessment

14.7.1 The Dust Risk Assessment considers the potential dust emissions magnitude at each stage of the works in conjunction with the sensitivity of the surrounding area. Based on these parameters, the site will be classified as low, medium or high risk, and mitigation measures corresponding to the perceived level of risk can then be proposed.

14.7.2 The assessment considers the potential dust risk across a set of pre-defined zones, up to 350mfrom the DCO Site. These zones are presented in Plate 14-1.

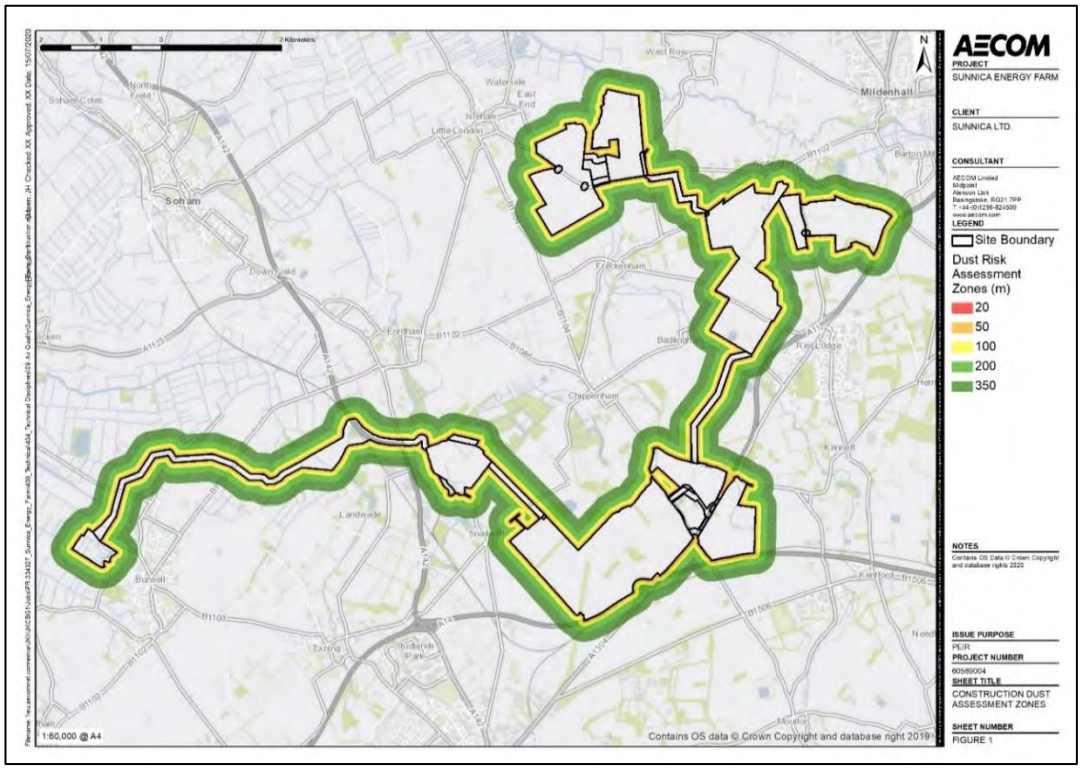

Plate 14-1 Construction Dust Risk Assessment Zones

14.7.3 The Dust Risk Assessment is provided in Table 14.5. Responses are written in italics.

Table 14.5 Dust Risk Assessment

STEP 1 – SCREENING

1a.	Is a human receptor site within:	
	50m of DCO Site	*Y*
	50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s)	*Y*
1b.	Is an ecological receptor site within:	
	50m of the DCO Site	*Y*
	50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s)	*Y*
IF ANSWERS TO 1A OR 1B ARE 'YES' COMPLETE 1C AND COMPLETE THE ASSESSMENT		
1c.	Provide a description of the proposed demolition and construction activities, their location and duration and any phasing of the development, including: • The proximity and number of receptors;	

	• The specific sensitivity of the receptor(s), e.g. a primary school or hospital; • The duration for which the sources of dust emissions may be close to the sensitive receptors; and • In the case of PM_{10} the local background concentration. *The anticipated duration of the works is from late 2022 to 2025 over a 24-month period, with peak construction occurring in 2023; sources of dust emissions likely to occur during this period. The greatest potential for dust effects is likely to occur during the excavation and earthworks phases, in addition to the substructure construction period.* *The DCO Site is located in a sparsely populated rural area and consequently there are a limited number of receptors in proximity to the DCO Site that may be affected by the works. This includes high sensitivity receptors such as residential properties, as well as medium sensitivity receptors such as commercial, office and warehouse units (see Plate 14-1)* *Defra background maps indicate an average background PM_{10} concentration of 15.8 µg/m^3 across the study area in 2018. This is well below the annual average objective value (40 µg/m^3).*	
STEP 2 – ASSESS THE RISK OF DUST IMPACTS		
STEP 2A – Define the Potential Dust Emission Magnitude		
DEMOLITION PHASE		
2a(i)	Is the volume of demolition:	
	Large • Total volume of building to be demolished (>50,000 m^2); or • Potential dusty construction material (e.g. concrete); or • On-site crushing and screening; or • Demolition activities >20m above ground level.	*N/A*
	Medium • Total volume of building to be demolished 20,000 m^3 – 50,000m^3; or • Potential dusty construction material; or • Demolition activities 10-20 m above ground level.	*N/A*
	Small • Total volume of building to be demolished <20,000 m^3; or • Construction material with low potential for dust release (e.g. metal cladding or timber); or • Demolition activities <10m above ground level and demolition during wetter months.	*N/A*
EARTHWORKS PHASE		
2a(ii)	Is the scale of the earthworks:	
	Large • Total site area >10,000m^2; or • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size); or • >10 heavy earth moving vehicles active at any one time on-site; or • Formation of stockpile enclosures >8m in height; or • Total material moved >100,000 tonnes (where known).	*Y*
	Medium • Total site area 2,500 m^2-10,000 m^2; or • Moderately dusty soil type (e.g. silt); or • 5-10 heavy earth moving vehicles active at any one time on-site; or • Formation of stockpile enclosures 4-8m in height; or • Total material moved 20,000-100,000 tonnes (where known).	N/A
	Small • Total site area <2,500 m^2; or • Soil type with large grain size (e.g. sand); or • <5 heavy earth moving vehicles active at any one time onsite;	N/A

	• Formation of stockpile enclosures <4min height; or • Total material moved <10,000 tonnes (where known), or earthworks during wetter months.	
CONSTRUCTION PHASE		
2a(iii)	Is the scale of the works:	
	Large • Total building volume >100,000 m^2; or • Piling; or • On-site concrete batching; or • Sandblasting.	*Y – site area exceeds 100,000m^2*
	Medium • Total building volume 25,000 m^3-100,000 m^3; or • Potentially dusty construction material (e.g. concrete); or • On-site concrete batching.	N/A
	Small • Total building volume <25,000 m^3; or • Construction material with low potential for dust release (e.g. metal cladding or timber).	N/A
TRACKOUT		
2a(iii)	Only receptors within 50m of the route(s) used by vehicles on the public highway and up to 500m from the site entrance(s) are considered to be at risk from the effects of dust. Will the trackout be:	
	Large • >50 Heavy Duty Vehicle (HDV; >3,5t) outward movements in one day; • Potentially dusty surface material (e.g. high clay/silt content); or • Unpaved road length >100m.	*Y*
	Medium • 10-50 HDV (>3,5t) outward movements in any one day; • Moderately dusty surface material (e.g. high clay content); or • Unpaved road length 50-100m (high clay content)	N/A
	Small • <10 HDV (>3.5t) trips in any one day; • Surface material with low potential for dust release; or • Unpaved road length <50m.	N/A
STEP 2B – Define the Sensitivity of the Area		
Define the Receptor Sensitivity		
2b(i)	Sensitivity of People to Dust Soiling Effects	
	Is the location a:	
	• High sensitivity receptor	*Y*
	• Medium sensitivity receptor	N/A
	• Low sensitivity receptor	N/A
2b(ii)	Sensitivity of People to Health Effects of PM_{10}	
	Is the location a:	
	• High sensitivity receptor	*Y*
	• Medium sensitivity receptor	N/A
	• Low sensitivity receptor	N/A
2b(iii)	Sensitivity of Receptors to Ecological Effects – *The following designated ecological sites have been identified within 50m of the DCO Site and within 500m from the site entrance on routes expected to be used by HGVs:* • *Snailwell Meadows SSSI; and* • *Chippenham Fen and Snailwell Poor's Fen (SSSI / Ramsar / SAC).* An 'ecological receptor' refers to any sensitive habitat affected by dust soiling. This includes the direct impacts on vegetation or aquatic ecosystems of dust deposition, and the indirect impacts on fauna (e.g. on foraging habitats). For locations with a statutory designation, e.g. Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs), consideration should be given as to whether the particular site is sensitive to dust and this will depend	

	on why it has been designated. Some non-statutory sites (i.e. local wildlife sites) and/or locations with very specific sensitivities may also be considered if appropriate. *Therefore, the risk of dust effects at Nationally or European designated ecological sites will be considered further in this assessment.*

Estimate the number of receptors and the distance from the DCO Site in the closest buffer with receptors:
There are between 5-10 residential dwellings within 20m of the DCO Site, with additional receptors within the full 350m buffer.

Combined Sensitivity of the area for Dust Soiling Effects = *MEDIUM. The presence of 1-10 high sensitivity receptors (i.e. residential dwellings) within 20m of the Site boundary results in a combined MEDIUM sensitivity for Dust Soiling Effects.*

Combined Sensitivity of the area to Human Health Impacts = *LOW. Annual mean PM_{10} concentrations of <24 across the study area in conjunction with the presence of <100 sensitive receptors within 20m of the Site boundary result in a combined LOW sensitivity for Human Health Impacts.*

Combined Sensitivity of the area to Ecological Impacts = *HIGH. Nationally designated, potentially sensitive ecosystems are situated within 20m of the Site boundary, thus a combined HIGH sensitivity of the study area to Ecological Impacts.*

Demolition

14.7.4 The development of the application site will not require any demolition. Demolition has therefore been scoped out and will not be considered further within this assessment.

Earthworks

14.7.5 The Scheme site area is greater than 10,000 m^2, and therefore the potential dust emissions magnitude associated with earthworks is considered to be large.

14.7.6 The sensitivity of the area to dust soiling during the Earthworks phase is high due to the proximity of sensitive receptors, therefore, the risk of dust impact for earthworks activities is classified as medium risk to dust soiling.

14.7.7 The sensitivity of the area is low for human health impacts due to low background particulate matter concentrations. Therefore, the risk of dust impact for earthworks activities is classified as a low risk to human health.

14.7.8 Sensitivity of ecological sites within the study area to dust-related impacts is high due to their proximity to the DCO Site boundary, and therefore a high risk to ecology has been predicted.

Construction

14.7.9 The site area exceeds 100,000 m^2 and therefore the potential dust emissions magnitude for construction activities is expected to be large.

14.7.10 The sensitivity of the area to dust soiling is high due to the proximity of sensitive receptors, therefore the risk of dust soiling is medium.

14.7.11 The sensitivity of the area to human health impacts is low. Therefore, the risk of impacts on human health is low.

14.7.12 Sensitivity of ecological sites within the area is high. Therefore, the risk of dust impact for construction activities is classified as high risk to ecology has been predicted.

Trackout

14.7.13 The number of construction-related HDV movements generated by the Scheme is estimated to exceed 50 vehicles per day during the peak of the construction. Considering the size of the DCO Site, and the soil type, the potential dust emissions magnitude for trackout is assumed to be large.

14.7.14 The sensitivity of the area to dust soiling is high, therefore the risk of dust soiling is high.

14.7.15 The sensitivity of the area to human health is low. Therefore, the risk of dust impacts on human health is low.

14.7.16 Sensitivity of ecological sites within the area is high. The risk of dust impact for trackout activities is classified as high risk for ecology.

14.7.17 A summary of the magnitude of emissions, sensitivity of receptor and the significance of effect is provided in Table 14.6, Table 14.7 and Table 14.8, below.

Table 14.6: Summary of Potential Dust Emission Magnitudes for Construction Phase Activities

Activity	*Potential Dust Emission Magnitude*
Demolition	N/A
Earthworks	Large
Construction	Large
Trackout	Large

Table 14.7: Summary of Area Sensitivity to Construction Phase Activities

Potential Impact	*Sensitivity of the Surrounding Area*			
	Demolition	*Earthworks*	*Construction*	*Trackout*
Dust Soiling	N/A	Medium	Medium	Medium
Human Health (PM_{10} effects)	N/A	Low	Low	Low
Ecology	N/A	High	High	High

Table 14.8: Summary of Risk of Dust Effects for Construction Phase Activities on Human Receptors without Mitigation

Potential Impact	*Summary of Dust Risk*			
	Demolition	*Earthworks*	*Construction*	*Trackout*
Dust Soiling	N/A	Medium Risk	Medium Risk	Medium Risk
Human Health (PM_{10} effects)	N/A	Low Risk	Low Risk	Low Risk
Ecology	N/A	High Risk	High Risk	High Risk

14.8 Decommissioning

14.8.1 Decommissioning is assumed to generate similar effects to those anticipated during the construction phase, and therefore the mitigation measures proposed for implementation during the construction phase will be appropriate for application to decommissioning. A Decommissioning Environmental Management Plan will be prepared for the Scheme.

14.9 Mitigation Measures

14.9.1 The adoption of good site practice will be implemented through measures to control dust as outlined within the IAQM's 'Guidance on the assessment of Dust from Demolition and Construction' document (Ref 14-23) that are appropriate for the level of risk identified in the assessment and the construction phase activities.

14.9.2 The mitigation measures to be incorporated into the CEMP for the Scheme are summarised in Table 14.9 and Table 14.10.

Table 14.9: Mitigation for a High-Risk Site

Activity	*Mitigation Measure*	*Recommendation Level based on IAQM Guidance*
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on-site	Highly Recommended
	Display the name and contact details of person(s) accountable for air quality and dust issues on the DCO Site. This may be the environment manager/engineer or the site manager.	Highly Recommended
	Display the head or regional office contact information	Highly Recommended
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections	Highly Recommended
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.	Highly Recommended
	Make the complaints log available to the local authority when asked	Highly Recommended
	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the logbook.	Highly Recommended

Activity	*Mitigation Measure*	*Recommendation Level based on IAQM Guidance*
	Hold regular liaison meetings with other high-risk construction sites within 500m of the DCO Site (if applicable), to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.	Highly Recommended
Monitoring	Undertake daily 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 authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of DCO Site, with cleaning to be provided if necessary.	Desirable
	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	Highly Recommended
	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.	Highly Recommended
	Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on-site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	Highly Recommended
Preparing and Maintaining the Site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	Highly Recommended
	Erect solid screens or barriers around dusty activities that are at least as high as any stockpiles on-site where stockpiles are within 100m of receptors.	Highly Recommended
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period where operations are within 100m of receptors.	Highly Recommended
	Avoid site runoff of water or mud.	Highly Recommended
	Keep site fencing, barriers and scaffolding clean using wet methods.	Highly Recommended
	Remove materials that have a potential to produce dust from the DCO site as soon as	Highly Recommended

Activity	Mitigation Measure	Recommendation Level based on IAQM Guidance
	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.	Highly Recommended
Operating vehicle/machinery and sustainable travel*	Ensure all vehicles switch off engines when stationary - no idling vehicles.	Highly Recommended
	Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	Highly Recommended
	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)	Highly Recommended
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials	Highly Recommended
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)	Highly Recommended
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.	Highly Recommended
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate	Highly Recommended
	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.	Highly Recommended
Waste Management	Avoid bonfires and burning of waste materials.	Highly Recommended

Table 14.10: Activity-Specific Mitigation Measures

Activity	Mitigation Measure	Recommendation Level by IAQM Guidance
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable	Highly Recommended
	Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable	Highly Recommended
	Only remove the cover in small areas during work and not all at once	Highly Recommended

Activity	*Mitigation Measure*	*Recommendation Level by IAQM Guidance*
Construction	Avoid scabbling (roughening of concrete surfaces) if possible	Highly Recommended
	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.	Highly Recommended
	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.	Highly Recommended
	For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.	Desirable
Track-out	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	Highly Recommended
	Avoid dry sweeping of large areas.	Highly Recommended
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport	Highly Recommended
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	Highly Recommended
	Record all inspections of haul routes and any subsequent action in a site logbook.	Highly Recommended
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	Highly Recommended
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	Highly Recommended
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	Highly Recommended
	Access gates to be located at least 10 m from receptors where possible.	Highly Recommended

14.10 Residual Effects

14.10.1 The dust assessment has identified the potential for high risk of adverse effects on ecology (nationally significant ecological site within 20m of the

site boundary), medium risk associated with dust deposition, and low risk to human health. The high risk to the ecological site is a worst-case assuming that the sites are sensitive to dust deposition. This will be confirmed within the Ecology chapter of the ES. Following implementation of the CEMP, which will incorporate the mitigation measures outlined above, the effect on ecology, dust deposition, and human health is anticipated to be not significant.

14.10.2 An assessment of the effect of road traffic emissions on local air quality during the construction phase will be included in the ES. At this stage, given the relatively good air quality conditions in the DCO Site and surrounding area, it is not expected that the additional road traffic will lead to any exceedances of the national air quality strategy objectives. The traffic levels will be akin to the current peak hour, albeit occurring between 06:00-07:00 and 19:00-20:00. The significance of this change will be reported in the ES; however, at this stage it is not anticipated likely to be significant.

14.11 Cumulative Effects

14.11.1 This section of the chapter assesses the potential effects of the Scheme in combination with the potential impacts of other development schemes (referred to as 'cumulative developments') within the surrounding area, as listed within ***Chapter 5: EIA Methodology*** of this PEI Report.

14.11.2 Any development occurring at the same time as the Scheme will be required to undertake its own dust risk assessment and implement mitigation to ensure that there are no off-site impacts. As such there are no cumulative effects to be considered, as the Scheme will also ensure that there are no off-site impacts from the demolition and construction phase.

14.12 References

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Ref 14-6 Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02008L0050-20150918

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Ref 14-11 European Council, “97/101/EC: Council Decision of 27 January 1997 establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States,” 1997. Available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A31997D0101

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Ref 14-14 Department for Communities and Local Government (DCLG) (2019). The National Planning Policy Framework. DCLG. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdfv

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Ref 14-16 H.M. Government (2010). The Conservation of Habitats and Species Regulations 2010. Available at: http://www.legislation.gov.uk/uksi/2010/490/contents/made

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Ref 14-23 IAQM (2014). Guidance on the assessment of dust from demolition and construction. Institute of Air Quality Management.

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