Chapter 4

AIR QUALITY

4 Air quality

Introduction

4.1 ACCON UK was appointed to undertake an analysis of the potential for air quality effects, including the generation of dust during construction, increased emissions from traffic post-construction and the potential for odour emissions from on site treatment of wastewater if that option is chosen. This chapter summarises the findings of ACCON UK's assessment and the full report is included as technical appendix B. The references and data sources used in the assessment are shown in table 4.1.

Air Quality Consultants, 2016, Deriving Background Concentrations of NO_x and NO_2 for use with CURED V2A
Air Quality Consultants, 2016, Emissions of Nitrogen Oxides from Modern Diesel Vehicles
APIS website: www.apis.ac.uk
Defra, 2016, Review and Assessment: Technical Guidance LAQM.TG16
Defra website: http://laqm.defra.gov.uk
Environmental Protection UK and Institute of Air Quality Management, 2017, Land-Use Planning & Development Control: Planning for Air Quality
Institute of Air Quality Management, 2016, Guidance on the Assessment of Dust from Demolition and Construction v1.1
Natural England's Magic map website: www.natureonthemap.naturalengland.org.uk
South Cambridgeshire District Council, 2007, Development Control Policies Development Plan Document
South Cambridgeshire District Council, 2013, Proposed Submission Local Plan
South Cambridgeshire District Council, 2016, 2016 Air Quality Annual Status Report
Table 4.1: References and data sources

Legislation and policy

National legislation and policy

4.2 Part IV of the Environment Act 1995 introduced a system of local air quality management (LAQM). This requires local authorities to review and assess air quality within their boundaries against a series of objectives. The *Air Quality Strategy* (2007) established the policy for ambient air quality for the UK and set out national air quality objectives. Where these are unlikely to be met, a local authority must designate an air quality management area (AQMA) and draw up an air quality action plan.

4.3 The Air Quality Standards Regulations 2010 implement the EC's Directive 2008/50/EC on ambient air quality and cleaner air for Europe. The regulations set out a series of mandatory limit values assigned to individual pollutants, based on an assessment of the effects of each pollutant on public health. These limit values are the same as the national air quality objectives, but differ in terms of compliance dates, locations where they apply and the legal responsibility for ensuring they are complied with. The limit values for the most relevant pollutants to this assessment are set out in table 4.2.

Pollutant	Averaging period	Limit value	Margin of tolerance
Nitrogen dioxide (NO_2)	One hour	200 µg/m^3 Not to be exceeded more than 18 times per year	--
	Calendar year	40 µg/m^3	--
Particulate matter (PM_{10})	One day	50 µg/m^3 Not to be exceeded more than 35 times per year	50%
	Calendar year	40 µg/m^3	20%
Particulate matter ($PM_{2.5}$)	Calendar year	25 µg/m^3	20%

Table 4.2: Air quality standard limit values

4.4 The National Planning Policy Framework (NPPF; 2012) sets out the government's planning policies for England. One of the 12 core principles in the NPPF is that planning should *"contribute to conserving and enhancing the natural environment and reducing pollution".* Specifically in relation to air pollution, paragraph 124 of the NPPF states that:

> *"Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan."*

4.5 The Department for Communities and Local Government's online National Planning Practice Guidance: *Air Quality* (2014) states that, when deciding whether air quality is relevant to a planning application, considerations could include whether the development would:

- Significantly affect traffic in the immediate vicinity of the proposed development site or further afield (e.g. by generating or increasing traffic congestion, significantly changing traffic volumes, vehicle speed or both, or significantly altering the traffic composition on local roads)
- Expose people to existing sources of air pollutants (e.g. by building new homes, workplaces or other development in places with poor air quality)
- Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations

Local policy

4.6 Policy NE/16 of South Cambridgeshire District Council's (SCDC) adopted Development Control Policies Development Plan Document (2007) relates to emissions to air and states that development proposals will need to have regard to any emissions arising from the proposed use and seek to minimise such emissions to control any risks and prevent detriment to local amenity. Development will not be permitted where it would adversely affect air quality in an AQMA.

4.7 Emerging policy is provided by the council's Proposed Submission Local Plan (2013). Policy SC/13 Air Quality states that applicants must demonstrate that:

- The development will not adversely affect air quality in an AQMA
- Pollution levels within an AQMA will not have a significant adverse effect on the proposed use
- The development will not lead to the declaration of a new AQMA
- The development will not interfere with the implementation of the current air quality action plan
- The development will not lead to an increase in emissions, degradation of air quality or increase in exposure to pollutants at or above the health-based air quality objective
- Any impacts on the proposed use from existing poor air quality are appropriately mitigated
- The development promotes sustainable transport measures and use of low emission vehicles to reduce the air quality impacts of vehicles

4.8 Policy CC/6 Construction Methods requires constructors to be considerate to neighbouring occupiers, including by locating storage compounds and using plant to avoid dust generation.

Methodology

4.9 This assessment is only concerned with the effect of the proposed development on the existing sensitive receptors in the vicinity of the site. The suitability of the site for the proposed development, in terms of introducing new receptors to existing air quality, is a land use planning issue and as such is considered to be outside the scope of this EIA. However, this issue is examined in technical appendix B.

Baseline

4.10 Information on the existing air quality in the vicinity of the site was obtained by collating the results of monitoring carried out by SCDC. The council's closest suitable monitoring locations to the site for which reliable traffic data are available are the diffusion tubes in Harston (7.5 km to the north west of the site) and Thriplow (6 km to the west of the site). Data from the automatic monitoring site at Girton (15 km to the north west of the site) were also used. Background concentrations of air pollutants were obtained from the Defra website. The references and data sources used in the study are shown in table 4.1.

4.11 The BREEZE ROADS software was used to model baseline concentrations of NO_2, PM_{10} and $PM_{2.5}$ at 14 sensitive receptors in the vicinity of the site. Full details of the modelling inputs are provided in technical appendix B.

Impact assessment

Effects during construction

4.12 A qualitative assessment of the potential effects from the generation and dispersion of dust and PM_{10} during construction was undertaken in accordance with guidance produced by the Institute of Air Quality Management (IAQM, 2016). The assessment considered the potential for effects relating to annoyance from dust soiling and health effects from a significant increase in exposure to PM_{10}. As there are no designated nature conservation sites with dust-sensitive features within 350 m of the site, the risk of harm to ecological receptors from construction dust has not been assessed. The impacts were assessed based on the following factors:

- The size of the site
- The range of activities undertaken across the site
- Proximity to sensitive receptors
- Prevailing wind direction
- Complexity of terrain
- Any barriers between sources and receptors

4.13 The sensitivity of the study area to construction dust impacts was defined based on the criteria set out in the guidance, which are summarised in figure 4.2 and reproduced in full in technical appendix B. The magnitude of dust emissions was defined using the criteria in figure 4.3, taking into account the general activity descriptors on site and professional judgement. The risk of dust impacts was then determined using the matrix in figure 4.4 to combine the measures of area sensitivity and dust emission magnitude, taking into account professional judgement.

Effects post-construction

Emissions from road traffic

4.14 The BREEZE ROADS model was used to predict annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ at the 14 existing sensitive receptors, both with and without the proposed development, in the completion year of 2030. The modelling was undertaken using the most recently released emissions factor toolkit (v7.0) published by Defra. A sensitivity test was also carried out for NO_2 using Air Quality Consultants' CURED V2A tool, which assumed higher emissions from certain vehicles than have been predicted by Defra. Full details of the model verification and data inputs, including traffic data used in the assessment, are provided in technical appendix B.

4.15 The significance of post-construction effects from road traffic emissions was assessed using the criteria produced by EPUK and the IAQM (2017). These criteria define impact descriptors based on the percentage change relative to the air quality assessment level (AQAL) as a result of the proposed development and the long term average concentration at a receptor in relation to the AQAL (figure 4.5). The overall significance of effects is determined, in accordance with the guidance, using professional judgement and taking account of the impact descriptors.

4.16 In addition, the potential for effects from increased traffic emissions on designated nature conservation sites was examined. Ecological receptors were identified using Natural England's Magic online mapping and relevant critical loads were obtained from the UK Air Pollution Information System (APIS) website. Roadside concentrations were assessed and any areas of high NO_2 or particulate matter concentrations or significant effects as a result of the proposed development were identified for further assessment.

Odour generation from wastewater management

4.17 As the final solution for the management of the proposed development's wastewater has not yet been determined, an outline assessment has been undertaken of the potential for odour generation. Likely sources of odour associated with the proposed options for wastewater management have been identified, together with measures to minimise odour generation.

Limitations and assumptions

4.18 There are several components that contribute to the uncertainty of modelling predictions. The BREEZE ROADS model does not predict the concentration of $PM_{2.5}$ directly, so this has been calculated using the typical ratio between the background concentrations of PM_{10} and $PM_{2.5}$ in 2030.

4.19 Predicting pollutant concentrations in future years is naturally subject to uncertainty because the model cannot be verified and it is necessary to rely on projections provided by the Department for Transport and Defra as to what will happen to traffic volumes, background pollutant concentrations and vehicle emissions. In the past, emissions of oxides of nitrogen (NO_x) have been forecast to reduce more rapidly than was actually found to be the case. A detailed comparison of the predictions of Defra's latest emissions factor toolkit against the results of on-road emissions tests has shown that Defra's latest predictions still have the potential to under-predict emissions from some vehicles, albeit by less than has historically been the case (Air Quality Consultants, 2016).

4.20 As discussed above, a sensitivity test was carried out to take account of this issue. The results of the sensitivity test are likely to over-predict emissions from vehicles in the future and therefore provide a reasonable worst case upper-bound to the assessment. Further details are provided in technical appendix B.

Baseline

Local air quality monitoring

4.21 SCDC has investigated air quality in the district as part of its responsibility under the LAQM regime. It has declared an AQMA for exceedances of the NO_2 annual mean objective and the PM_{10} daily mean objective, which covers an area along the A14 between Bar Hill and Milton, approximately 14.5 km to the north west of the site. Cambridge City Council has also declared an AQMA for exceedances of the NO_2 annual mean objective that covers much of the city, approximately 10 km north west of the site. Uttlesford District Council has declared an AQMA for exceedances of the NO_2 annual mean objective in Saffron Walden town centre, approximately 8.3 km south east of the site. Given the distances involved, the AQMAs will not be affected by the proposed development and are not considered further.

4.22 Annual mean NO_2 concentrations recorded at the council's diffusion tubes in Harston and Thriplow in 2015 were 29.5 $\mu g/m^3$ and 27.1 $\mu g/m^3$ respectively, significantly below the annual mean objective of 40 $\mu g/m^3$.

Background concentrations

4.23 Information on background concentrations of pollutants in the vicinity of the site was obtained from the Defra website. The data in table 4.3 show that the estimated annual mean background concentrations of NO_2 and PM_{10} are significantly below the relevant annual mean objectives.

Year	NO_x (µg/m³)	NO_2 (µg/m³)	PM_{10} (µg/m³)
2017	13.3-16.2	9.8-11.8	15.1-17.0
2030	9.1-10.8	6.9-8.1	14.3-16.2

Table 4.3: Estimated background pollutant concentrations
Note: The ratio between PM_{10} and $PM_{2.5}$ at the site in 2017 is 0.71 and in 2030 is 0.70

Modelled baseline air quality

4.24 The modelled baseline NO_2, PM_{10} and $PM_{2.5}$ concentrations at 14 sensitive receptors in the vicinity of the site are shown in table 4.4. The locations of the sensitive receptors are shown on figure 4.1.

Ref	Receptor type	NO_2 (µg/m³)	PM_{10} (µg/m³) (Days >50 µg/m³)	$PM_{2.5}$ (µg/m³)
ER1	Residential	13.6	16.6 (1)	11.6
ER2	Residential	17.1	17.3 (1)	12.1
ER3	Residential	16.8	17.3 (1)	12.1
ER4	Residential	12.8	17.0 (1)	11.9
ER5	Residential	13.8	17.2 (1)	12.0
ER6	Residential	15.5	16.9 (1)	11.9
ER7	Residential	12.1	16.9 (1)	11.8
ER8	Residential	12.2	16.9 (1)	11.8
ER9	Pre-school	12.1	15.4 (0)	10.8
ER10	Genome Campus	12.0	15.3 (0)	10.7
ER11	Residential	12.0	17.3 (1)	12.1
ER12	Residential	14.6	16.7 (1)	11.7
ER13	Residential	11.0	16.2 (0)	11.4
ER14	Residential	11.0	16.3 (0)	11.4

Table 4.4: Modelled 2017 baseline annual mean pollutant concentrations at sensitive receptors

4.25 The annual mean concentrations of all three pollutants are below the relevant objectives at all the receptors. As the annual mean NO_2 concentrations are below 60 µg/m³, it is unlikely that the 1-hour mean objective is being exceeded. Similarly, as the annual mean PM_{10} concentrations are below 32 µg/m³, it is unlikely that the 24-hour mean objective is being exceeded (Defra, 2016). Full details of the findings of the NO_2 sensitivity test are set out in technical appendix B, but the results do not differ materially from those shown in table 4.4.

Future baseline

4.26 The modelled future baseline (2030) annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations at the sensitive receptors are shown in table 4.5. The annual mean concentrations of all three pollutants are predicted to be below the relevant objectives at all the receptors. Full details of the findings of the NO_2 sensitivity test are set out in technical appendix B, but the results do not differ materially from those shown in table 4.5.

Ref	Receptor type	NO_2 (µg/m³)	PM_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)
ER1	Residential	9.0	15.8	10.9
ER2	Residential	11.5	16.6	11.4
ER3	Residential	11.6	16.7	11.5
ER4	Residential	8.6	16.2	11.2
ER5	Residential	9.3	16.4	11.3
ER6	Residential	10.3	16.2	11.2
ER7	Residential	8.4	16.0	11.0
ER8	Residential	8.5	16.0	11.0
ER9	Pre-school	8.3	14.5	10.0
ER10	Genome Campus	8.2	14.5	10.0
ER11	Residential	10.4	16.5	11.4
ER12	Residential	9.5	15.8	10.9
ER13	Residential	7.7	15.4	10.6
ER14	Residential	7.7	15.4	10.6

Table 4.5: Modelled future baseline (2030) annual mean pollutant concentrations at sensitive receptors

Effects during construction

4.27 The main sources of dust and particulate matter during the construction phase include the following:

- Handling, storing, stockpiling and disposing of materials, including potential spillages
- Ground disturbance and exhaust emissions associated with the operation of site plant
- Laying of hard surfaces and landscaping
- Site clearance and preparation
- Construction and fabrication processes
- Internal and external finishing
- Emissions associated with construction traffic on haulage routes and nearby roads

4.28 The IAQM guidance divides construction activities into four types, reflecting their different potential impacts: demolition, earthworks, construction and trackout (the transfer of dust and dirt by vehicles onto the public highway). The proposed development does not include any demolition, so this is not considered further.

4.29 Depending on wind speed and turbulence, it is likely that the majority of dust will be deposited in the area immediately surrounding the source (up to 200 m away). The dominant wind direction at the site is from the south west, so properties within 200 m to the north east of the site are more at risk of experiencing the effects of construction dust. In accordance with the IAQM guidance, the assessment was generally undertaken up to 350 m from the site. As the site is classified as large, the effects of trackout have been assessed up to 500 m from the site.

4.30 With reference to the guidance in figure 4.2, the area is considered to be of low sensitivity to dust soiling effects because there are fewer than 10 existing receptors within 50 m of the dust source (including 50 m either side of the road for trackout). In relation to human health effects from PM_{10} emissions during construction, baseline PM_{10} levels in the area must be considered. The modelled baseline concentrations in table 4.4 are representative of conditions near the site. Using the matrix in figure 4.2, as the annual mean PM_{10} concentration is less than 24 $\mu g/m^3$ and there are fewer than 100 receptors within 350 m of the dust source (500 m for trackout), the site area is of low sensitivity to human health effects.

4.31 While the soil on site is not likely to be highly dusty, as it comprises silty chalk, the size of the site with reference to figure 4.3 and the proposed construction of 3.5 m high bunds mean that the magnitude of dust emissions for earthworks is predicted to be large. As the total building volume will exceed 100,000 m^3 and construction methods are not known at this outline stage, the magnitude of dust emissions for construction is predicted to be large. In relation to trackout, there may be the potential for a relatively high level of unpaved road length during construction. However, the silty chalk surface material will be less dusty than a surface material with a high clay content. Therefore, the dust emission magnitude for trackout is predicted to be medium.

4.32 The dust emission magnitude and site area sensitivity have been combined to determine the risk of dust generation with no mitigation. For all three construction stages, the risk will be low for both dust soiling and human health effects.

Effects post-construction

Traffic

4.33 The predicted 'with development' NO_2, PM_{10} and $PM_{2.5}$ concentrations and the changes as a result of the proposed development are set out in table 4.6. The annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations will be significantly below the relevant objectives at the receptors. All the receptors are predicted to experience negligible increases in NO_2, PM_{10} and $PM_{2.5}$ levels as a result of the proposed development, which will not be significant. Full details of the findings of the NO_2 sensitivity test are set out in technical appendix B, but the results do not differ materially from those shown in table 4.6.

Receptor ref.	NO_2		PM_{10}		$PM_{2.5}$	
	Concentration (µg/m^3)	% change relative to AQAL	Concentration (µg/m^3)	% change relative to AQAL	Concentration (µg/m^3)	% change relative to AQAL
ER1	9.1	0	15.8	0	10.9	0
ER2	12.1	1	16.7	0	11.5	0
ER3	11.8	1	16.7	0	11.5	0
ER4	8.7	0	16.2	0	11.2	0
ER5	9.5	1	16.4	0	11.3	0
ER6	10.4	0	16.2	0	11.2	0
ER7	8.5	0	16.0	0	11.1	0
ER8	8.6	0	16.1	0	11.1	0
ER9	8.4	0	14.5	0	10.0	0
ER10	8.3	0	14.5	0	10.0	0
ER11	10.5	0	16.6	0	11.4	0
ER12	9.6	0	15.8	0	10.9	0
ER13	7.9	0	15.5	0	10.7	0
ER14	7.8	0	15.4	0	10.7	0

Table 4.6: Modelled 'with development' (2030) annual mean pollutant concentrations at sensitive receptors and change as a result of the proposed development

4.34 The annual mean NO_2 concentrations will be significantly below 60 µg/m^3 at all the receptors, so it is unlikely that the 1-hour mean NO_2 objective will be exceeded. Similarly, as the annual mean PM_{10} concentrations will be significantly below 32 µg/m^3, it is unlikely that the 24-hour mean PM_{10} objective will be exceeded at any of the receptors.

4.35 The sites of special scientific interest (SSSI) in close proximity to roads that will be used by occupiers of the proposed development are the Whittlesford – Thriplow Hummocky Fields SSSI and Dernford Fen SSSI. The APIS website shows that both sites have a critical nitrogen oxide load of 30 µg/m^3 (as NO_2) and, at the time of assessment, are significantly below this. As shown in table 4.6, all the modelled roadside locations will be significantly below 30 µg/m^3 with the proposed development in place. Therefore, the proposed development will not give rise to a significant effect at the ecological receptors as a result of increased road traffic emissions.

Odour

4.36 As discussed in chapter 2, three options are proposed to treat the wastewater arising from the proposed development. Traditional package treatment plants are self-contained, so there would be limited potential for fugitive odours from the plant itself if this option for on site treatment of wastewater were chosen. This is because the most odorous components of the system are the filter media or sludge, which are contained within the treatment units.

4.37 Therefore, the main potential odour source is the treated water, which requires further tertiary treatment using a constructed wetland. Subject to efficient treatment within the plants, the discharged water should not generate sufficient odour to cause a nuisance and the potential for odour is low when the units are working to specification. However, processes would need to be monitored in order to keep the biological oxygen demand and chemical oxygen demand within specification. Increases in either of these would increase the potential for odour generation. Controlling the initial organic loading and biological oxygen demand load can reduce odour generation.

4.38 The enhanced treatment plants are fully enclosed, which reduces the potential for fugitive odour release if this option is chosen. The wastewater would be treated ecologically and the treated water would be discharged into a constructed wetland. As for the traditional package unit option, the performance of the plant would need to be monitored to ensure that the treated water is not odorous to a significant degree when it is released onto the wetland.

4.39 If the option of connecting to the existing wastewater network is chosen, the only potentially odorous location within the proposed development would be the wastewater pumping station proposed in the west of the main site. Without a finalised plant design, it is not possible to comment on the pumping station's odour potential. The prevailing wind may disperse any odours towards the proposed development if careful consideration is not given to the plant design. However, it should be noted that the pumping station would be adopted by Anglian Water and so would need to be controlled in accordance with Anglian Water's standards.

4.40 Once a wastewater treatment option has been selected for the proposed development, an additional detailed odour assessment should be carried out to ensure that the potential for odour nuisance is minimised for both users of the site and local residents. However, if best practice in design and management and regulatory requirements are adhered to, no significant odour effects are predicted.

Mitigation

4.41 While the risk of effects from increased dust during construction has been assessed as low, the following measures to reduce dust generation during construction will be put in place through a construction environmental management plan:

- A risk-based dust management plan will be compiled
- Details will be recorded of all dust and air quality complaints made and of all significant air quality incidents
- Solid barriers will be erected around areas where dust-generating activities are being undertaken for an extensive period
- Dust-generating activities will be carried out away from the site where possible and potentially dusty objects (such as stockpiles or goods coming into the site) will be covered or screened
- Mains powered generators will be used and vehicles will be switched off when idle
- Non-road mobile machinery used on the construction site will meet stage IIIA of directive 97/68/EC and its subsequent amendments as a minimum
- Dust suppression or minimisation techniques will be employed during site operations and dust-suppression equipment will be accessible
- Drop heights will be minimised

4.42 With these best practice mitigation measures in place, the risks associated with dust generation during construction will be negligible and not significant.

4.43 As no significant adverse effects were predicted post-construction, no mitigation measures are required. As discussed in chapter 12, a sustainable transport strategy for the proposed development will be implemented through a site-wide travel plan to minimise traffic generation.

Residual effects

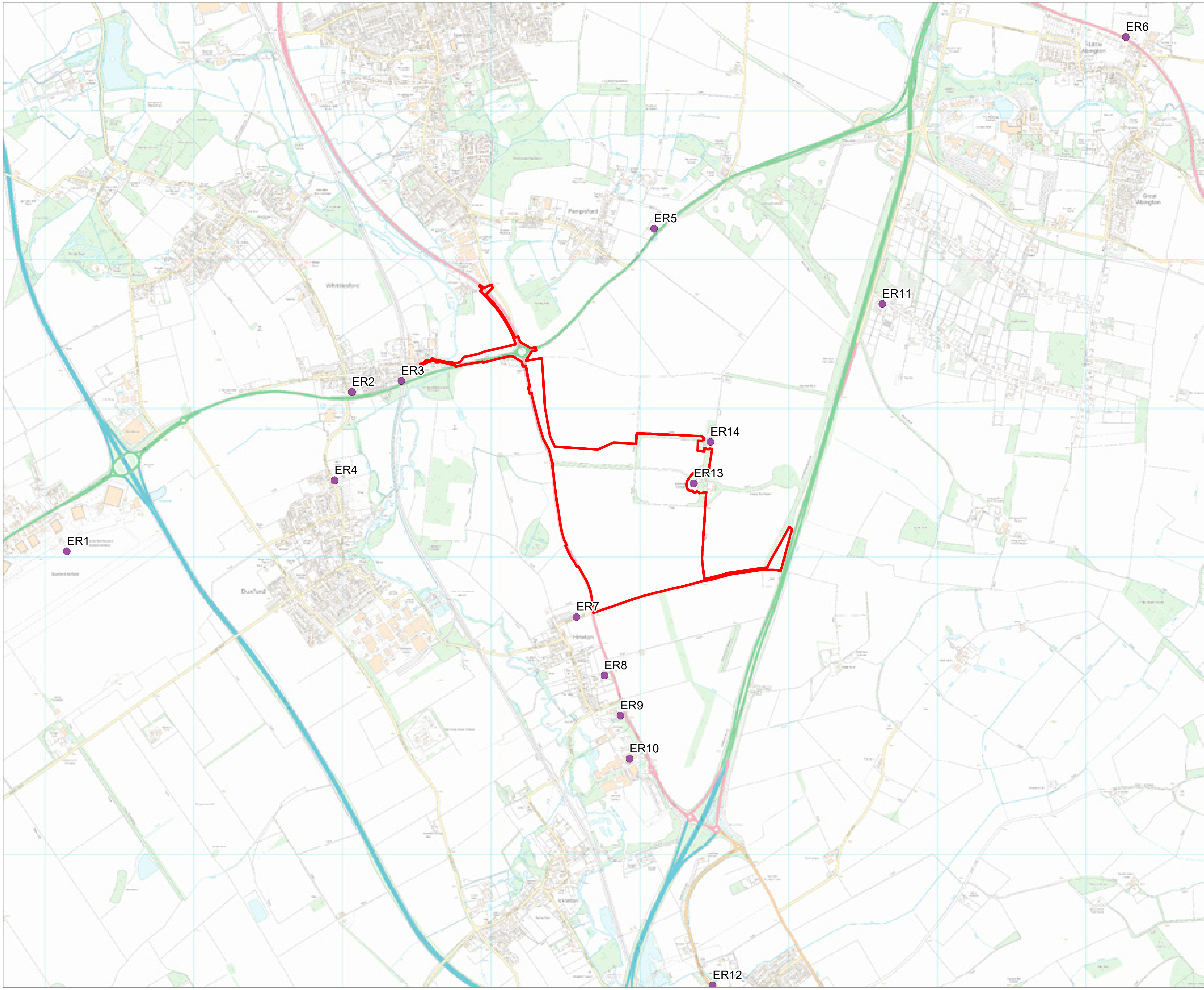
4.44 No significant residual effects are predicted.

Cumulative effects

4.45 As set out in chapter 3, the potential for cumulative effects with a number of consented and proposed developments in the area needs to be assessed. It is possible that the construction periods of the proposed development and other developments in the area may overlap. However, it is likely that these developments will also implement best practice construction methods to minimise dust generation. Given this, and the distance between the nearest sensitive receptors to the site and the other developments, no significant cumulative construction dust effects are predicted.

4.46 The traffic data used in the post-construction modelling included traffic arising from committed developments in the vicinity of the site. Therefore, the potential cumulative post-construction traffic emissions effects are included in the modelling results and no additional cumulative effects are envisaged.

4.47 While there will be emissions from plant and machinery, and localised dust generation, during the construction of the underground electricity connection to the Fulbourn sub-station to serve the proposed development, and the possible off site wastewater rising main, these will be temporary and limited in magnitude. Standard and proven construction techniques will be used to minimise dust generation and no significant cumulative effects are predicted on air quality during construction. There is no potential for the electricity connection or possible rising main to lead to significant effects on air quality post-construction.



Locations sensitive receptors

Site boundary

0 620 m

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Figure 4.1 Locations of sensitive receptors

Construction dust – sensitivity of the study area

Receptor sensitivity	No. receptors	Distance from source (m) <20	<50	<100	<350
Dust soiling effects on people and property					
High (e.g. dwellings, museums, long and medium stay car parks)	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium (e.g. parks and places of work)	>1	Medium	Low	Low	Low
Low (e.g. playing fields, farmland, short term car parks)	>1	Low	Low	Low	Low
Human health impacts					
High (e.g. dwellings, schools, care homes) and annual mean PM_{10} concentration >32 μg/m³	>100	High	High	High	Low
	10-100	High	High	Medium	Low
	1-10	High	Medium	Low	Low
High and annual mean PM_{10} concentration 28-32 μg/m³	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	High	Medium	Low	Low
High and annual mean PM_{10} concentration 24-28 μg/m³	>100	High	Medium	Low	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
High and annual mean PM_{10} concentration <24 μg/m³	>100	Medium	Low	Low	Low
	10-100	Low	Low	Low	Low
	1-10	Low	Low	Low	Low
Medium (e.g. office and shop workers) and annual mean PM_{10} concentration >32 μg/m³	>10	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium and annual mean PM_{10} concentration 28-32 μg/m³	>10	Medium	Low	Low	Low
	1-10	Low	Low	Low	Low
Medium and annual mean PM_{10} concentration <28 μg/m³	>1	Low	Low	Low	Low
Low (e.g. parks, playing fields, public footpaths)	>1	Low	Low	Low	Low
Ecological impacts					
High (e.g. internationally designated site with dust-sensitive features)	N/A	High	Medium	Not sensitive	
Medium (e.g. SSSI with dust-sensitive features)	N/A	Medium	Low	Not sensitive	
Low (e.g. locally designated site with dust-sensitive features)	N/A	Low	Low	Not sensitive	

Derived from: Institute of Air Quality Management, 2016, Guidance on the assessment of dust from demolition and construction

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Construction dust – dust emission magnitude

Dust emission magnitude	Activity
Large	Demolition: >50,000 m^3 building demolished; potentially dusty construction material (e.g. concrete); on site crushing and screening; demolition activities >20 m above ground level. Earthworks: Total site area >10,000 m^2; potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size); >10 heavy earth moving vehicles active at any one time; formation of bunds >8 m in height; total material moved >100,000 tonnes. Construction: Total building volume >100,000 m^3; on site concrete batching; sandblasting. Trackout: >50 HDV outward movements in any one day; potentially dusty surface material (e.g. high clay content); unpaved road length >100 m.
Medium	Demolition: Total building volume 20,000-50,000 m^3; potentially dusty construction material; demolition activities 10-20 m above ground level. Earthworks: Total site area 2,500-10,000 m^2; moderately dusty soil type (e.g. silt); 5-10 heavy earth moving vehicles active at any one time; formation of bunds 4-8 m in height; total material moved 20,000-100,000 tonnes. Construction: Total building volume 25,000-100,000 m^3; potentially dusty construction material (e.g. concrete); on site concrete batching. Trackout: 10-50 HDV outward movements in any one day; moderately dusty surface material (e.g. high clay content); unpaved road length 50-100 m.
Small	Demolition: Total building volume <20,000 m^3; construction material with low potential for dust release (e.g. metal cladding or timber); demolition activities <10 m above ground level; demolition during wetter months. Earthworks: Total site area <2,500 m^2; soil type with large grain size (e.g. sand); <5 heavy earth moving vehicles active at any one time; formation of bunds <4 m in height; total material moved <20,000 tonnes; earthworks during wetter months. Construction: Total building volume <25,000 m^3; construction material with low potential for dust release (e.g. metal cladding or timber). Trackout: <10 HDV outward movements in any one day; surface material with low potential for dust release; unpaved road length <50 m.

From: Institute of Air Quality Management, 2016, Guidance on the assessment of dust from demolition and construction.

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Construction dust – risk of dust effects without mitigation

Area sensitivity	Dust emission magnitude: Large	Dust emission magnitude: Medium	Dust emission magnitude: Small
High	High	Medium	Low (medium for demolition)
Medium	Medium (high for demolition)	Medium (low for trackout)	Low (negligible for trackout)
Low	Low (medium for demolition)	Low	Negligible

From: Institute of Air Quality Management, 2016, Guidance on the assessment of dust from demolition and construction.

Air quality – impact descriptors for individual receptors

Long term average concentration at receptor in assessment year	Percentage change in concentration relative to air quality assessment level (AQAL)			
	1%	2-5%	6-10%	>10%
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Note: The table is intended to be used by rounding the change in the percentage pollutant concentration to whole numbers, which then makes it clear which cell the impact falls within. Changes of 0% (i.e. less than 0.5%) will be described as negligible.

From: Environmental Protection UK and the Institute of Air Quality Management, 2017, Land-Use Planning & Development Control: Planning for Air Quality.