APPENDIX 2.1
SCOPING REQUEST

Cambridge North Phase Two Commercial Quarter
Brookgate
Bidwells
November 2021

BIDWELLS

EIA
SCOPING REPORT

Quality Assurance

Site name:	Cambridge North Phase Two Commercial Quarter
Client name:	Brookgate Land Ltd
Type of report:	EIA Scoping Report
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Signed	
Date	25 November 2021
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Signed	
Date	25 November 2021

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SECTION BREAK – DO NOT DELETE

1.0 Introduction

Purpose of this Report

1.1 Brookgate Land Ltd are seeking planning permission for a commercial development on land to the south of Cowley Road and adjoining Milton Avenue, Cambridge North. The proposals represent the next stage of the comprehensive redevelopment of Cambridge North and comprise:

- A Full Application for c47,280sqm (GEA) of Class E floorspace comprising an office building (One Milton Avenue) and two lab buildings together with ground floor amenity uses, a Mobility Hub comprising of c1031 car parking spaces including c3,742sqm of Class E floorspace at ground floor level, a temporary car park of c379 spaces, a wildlife habitat area, Network Rail compound area, enabling works and associated infrastructure; and
- An Outline Application for c41,940 sqm of Class E floorspace on the 'Triangle Site' comprising one lab building and one office building, together with ground floor amenity uses, enabling works and associated infrastructure.

1.2 The original version of this proposal was the subject of a Screening Opinion dated 6/6/2017 (S/1714/17/E1), which confirmed that an Environmental Impact Assessment (EIA) would be required in accordance with the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2017 (hereafter referred to as "the EIA Regulations"). Although the proposal and site area have now changed, the applicant accepts that the need for EIA remains.

1.3 A second version of this proposal was brought forward in 2020 and progressed as far as the receipt of a Scoping Opinion from South Cambridgeshire District Council (October 2020). Further review of the scheme has resulted in a number of changes, including removal of the residential element and amendments to the red line. This document sets out the suggested scope for the EIA as a basis for requesting a new Scoping Opinion.

Policy Background

1.4 The site is located within North East Cambridge (NEC), which has been identified for redevelopment within successive local plans and currently as an Area of Major Change under Policy SS/4 of the South Cambridgeshire Local Plan (2018). This policy encourages employment-led mixed-use redevelopment but does not specify the appropriate quantum or mix of uses, which are to be established through the development of an Area Action Plan (AAP).

1.5 The North East Cambridge AAP is currently being prepared by the Greater Cambridge Shared Planning Service, covering the area from Cambridge North Station through to CambridgeScience Park. An Issues and Options consultation (Reg 18) took place in February-March 2019, and the AAP Draft Plan (Reg 18) consultation took place between July-October 2020.

1.6 The Local Development Scheme for Greater Cambridge indicates that the next stages for the AAP are as follows:

- Proposed Submission Consultation (Reg 19) Autumn/Winter 2023 (dependent on outcome of Milton Waste Water Treatment Plant (WTP) DCO);
- Submission to Secretary of State for Independent Examination (Reg 22) Spring 2024 (subject to the outcome of Milton WTP DCO); and
- Adoption of AAP subject to progress of independent Examination.

Existing and Ongoing Development at Chesterton Sidings/Cambridge North Station

1.7 Network Rail and Brookgate Land Limited have been working together to facilitate the delivery of the new Cambridge North Station and surrounding land within the former Chesterton Sidings as part of the wider redevelopment of Cambridge North. The redevelopment of Cambridge North Station has comprised a number of planning applications, as summarised below.

1.8 The Cambridge North Station development comprises the station building adjacent to the existing railway line, with a 1,000-space covered cycle park located to the south, Station Square to the west and a 450-space car park to the north. Planning permission was secured in February 2015 (Ref: S/0467/13/CM) for the reconfiguration and consolidation of the existing minerals processing and transfer operation and other works associated with relocation of the former rail sidings. The associated rationalisation and realignment of the rail sidings were completed in 2016, freeing up land for development and for the provision of the new Cambridge North Station in the south-eastern corner of the former sidings.

1.9 Permission was granted in September 2016 for the 'Station Amendments' planning application (Ref: S/3102/15/FL & 15/2317/FUL), which comprised amendments to aspects of the permitted Cambridge North Station Interchange development (Ref: S/1236/15/FL & 15/0994/FUL) to facilitate the relocation and reconfiguration of the proposed station car park; revised vehicular, cycle and pedestrian access arrangements; and reconfiguration of Station Square and taxi drop-off area. The Station Amendments application established the location of a number of access roads and Station Square. This application was subject to EIA, and an Environmental Statement(ES) was submitted in support of this application. Cambridge North Station was completed and opened for passenger services in May 2017.

1.10 Two subsequent concurrent applications, comprising a hotel (also known as Two Cambridge Square) and office (also known as One Cambridge Square) adjacent to Cambridge North Station, both with ground-floor retail floorspace and a 145-space temporary car park and cycle storage, were granted planning permission in 2018. The Hotel was granted planning permission in August 2018 (under application reference S/2372/17/FL). Subsequent Non-Material Amendment applications were granted permission in October 2018 (under application reference S/3475/18/NM) and July 2020 (under application reference S/2372/17/NMA1).

1.11 The Office was granted planning permission in August 2018 (under application reference S/4478/17/FL). A subsequent Minor Material Amendment application was granted planning permission in April 2019 (under application reference S/4824/18/VC). A Non-Material Amendment application is also currently pending determination (S/4824/18/NMA). These proposals are referred to as "Phase 1a" and were brought forward to create a focus of activity around the new station, acting as a catalyst for the future regeneration of the wider site. EIA was deemed not to be required

for this project (Ref: S/1245/17/E1). Whilst the hotel is now complete, the office scheme is currently under construction.

2.0 Site Context

Location and Existing Condition

2.1 The Site lies within South Cambridgeshire District and forms part of the former Chesterton Sidings site, adjacent to Cambridge North Station. It is located on the north-east edge of Cambridge, approximately 3km from the city centre, and lies to the north and west of the River Cam, east of the Cambridge Business Park and south of the A14 and the Cambridge Water Recycling Centre. A plan showing the Application Site is attached as **Appendix 1**.

2.2 The Site is irregular in shape, with an area of approximately 9.7 hectares. It is bound to the north bythe remainder of the former Chesterton Sidings, to the east by the railway line, to the south by Two Cambridge Square (hotel), and to the west by the Cambridge Guided Busway (CGB) and Milton Avenue.

2.3 The Site is characterised by the existing surface level railway station car park of 428 spaces, areas of hardstanding and scrub. The site has been partially cleared as part of the site preparation works for Cambridge North Station. Milton Avenue, which provides access between Cowley Road and Cambridge North Station, forms part of the western edge of the site.

Geology and Hydrogeology

2.4 The majority of the Site is underlain bythe Gault Formation, which comprises mudstones of mainly siliciclastic sediments deposited as mud, silt, sand and gravel. The Proposed Development is not within a groundwater Nitrate Vulnerable Zone (NVZ) or groundwater Source Protection Zone (SPZ) or a Principal Aquifer.

Flood Risk and Drainage

2.5 The nearest watercourse to the Site is the River Cam which is located approximately 500m to the south and 500m to the east. The Environment Agency (EA) flood maps indicate that the Site is in Flood Zone 1 and, therefore, not at risk of flooding from rivers and seas. Further to this, the EA's map has identified that the Site is not located within an area at risk of reservoir flooding.

Ecology and Nature Conservation

2.6 There are no designated sites of international or national ecological importance located within the Site or within 2km of its boundary. There are six Local Nature Reserves (LNRs) within 2km of the Site, the closest of these being the Bramblefields LNR, which lies 100m to the south-west. There are 16 non-statutory designated sites located within 2km of the Site, the closest being the River Cam County Wildlife Site (CWS), located 300m to the east.

Cultural Heritage

2.7 There are no Scheduled Ancient Monuments or Listed Buildings on the Site or within 500m of its boundary. There are also no Registered Park or Gardens or historic battlefields in close proximity

to the Site. The nearest Conservation Area is the Fen Ditton Conservation Area, located approximately 600m to the east, separated from it by existing development.

2.8 An Archaeological Desk-Based Assessment and Ground Investigation were carried out as part of the EIA for the Cambridge North Station Amendments application in 2015. The assessment concluded that the wider Chesterton Sidings site is thought to have been fields from the Medieval period up until the mid-19th Century, when the railway and its sidings were built. The investigations concluded that no archaeological remains were present and that any remains, even if present, would have been truncated by the later use of the Site. The survival of any archaeological deposits in the area is considered to be very unlikely.

Landscape Character

2.9 The Site is not subject to any landscape or land use designations. The Cambridge Green Belt is located approximately 350m to the east of the Site, separated from it by existing development. The Site is located on the extreme eastern edge of the Bedfordshire and Cambridgeshire Claylands National Character Area (NCA), and also demonstrates the influence of the adjacent Fens NCA and East Anglian Chalk NCA.

Transport

2.10 Vehicular access to the Site is gained via Milton Avenue, which links Cambridge North Station with Cowley Road. Cowley Road provides access to the wider highway network, including the A10 and its junction with the A14 to the north. In addition, the Site benefits from excellent sustainable transport links. It is adjacent to Cambridge North Station and the Guided Busway, will be served by other bus services using Milton Road and is within cycling distance of the MiltonPark and Ride. It is also adjacent to the cycleway along the Guided Busway and will be served bythe Chisholm Trail cycling route to be delivered through funding from the Greater Cambridge CityDeal. It is within walking distance of Chesterton, Abbey, King's Hedges and Milton.

Air Quality and Noise

2.11 The Site is not located within an Air Quality Management Area (AQMA). The main sources of background noise at the site are road traffic and train movements.

3.0 Proposed Development

Introduction

3.1 This section provides an outline description of the proposed development. Since the design is subject to further refinement, aspects of this description may change in detail (e.g. precise floorspace or unit numbers), but any such changes are unlikely to be material for scoping purposes.

Quantum and Mix of Uses

3.2 The Proposed Development will comprise:

- c92,960sqm (GEA) of Class E floorspace (offices, laboratories and associated amenity and retail uses (mainly at ground floor level));
- a multi-storey Mobility Hub (of c1,031 spaces);
- a temporary car park (of c379 spaces)
- an area of "wild habitat" to provide part of the biodiversity net gain;
- the re-provision of an existing Network Rail compound;
- roads, cycle ways and pedestrian routes;
- areas of public realm; and
- drainage and other supporting infrastructure.

Overview of Layout and Massing

3.3 The outline application would comprise one laboratory building and one office building, on what is known as the 'Triangle Site', defined by Milton Avenue to the west, Cowley Road to the north and the existing railway station car park to the east. The buildings would be located on the northern and southern parts of the site, separated by 'Chesterton Square', an area of proposed public realm. The northern building would be 5-6 storeys in height (+ plant) and the southern building 6-8 storeys.

3.4 The full application would comprise two main parcels; namely One Milton Avenue, located to the west of Milton Avenue; and a linear parcel located, largely on the site of the existing railway station car park.

3.5 One Milton Avenue would be a 5-7 storey office building, with a step-back at level 4 to accommodate a terrace.

3.6 The eastern parcel would accommodate, from north to south, a laboratory building of 4-5 storeys (+ plant), a laboratory building of 3-4 storeys (+ plant) and the Mobility Hub. The Mobility Hub would comprise ground + 7 levels of car parking, with amenity and retail space at ground level. The Mobility Hub would accommodate c1,031 car parking spaces. It is proposed that 628 of these spaces would be provided for rail users with the remainder for the commercial development. The existing 428 surface level car parking spaces for Cambridge North station will be maintained throughout the construction period through providing temporary surface level parking on the

'Triangle Site' and in a location north of Cowley Road. Once complete, the Mobility Hub will accommodate the existing quantum of rail-related car parking, plus an additional 200 car parking spaces for rail use.

3.7 A "wild habitat" area would be located to the east of the temporary car park north of Cowley Road and would comprise "open mosaic" habitat developed through the enhancement of existing trees and scrub.

4.0 EIA Methodology and Scope

Need for EIA

4.1 EIA is a systematic process through which the likely significant environmental effects of a proposed development are identified, assessed and, where possible, adverse impacts are reduced, and beneficial impacts enhanced. EIA ensures that information on the potential for significant environmental effects is readily available for decision-makers to consider in the determination of an application. The process in England and Wales is governed by the Town andCountry Planning (Environmental Impact Assessment) (England and Wales) Regulations 2017.

4.2 Certain types of development are required to be the subject of EIA ("EIA development"). Schedule 1 of the EIA Regulations lists the type and scale of development that automatically require EIA ("Schedule 1 development"). Schedule 2 of the EIA Regulations sets out the development types that may require EIA ("Schedule 2 development"). To qualify as a Schedule 2 development, it must be either located in a "Sensitive Area" as defined in Regulation 2(1) or exceed the applicable threshold in Schedule 2. Sensitive Areas include Sites of Special ScientificInterest (SSSIs), Areas of Outstanding Natural Beauty (AONBs) and Scheduled Monuments.

4.3 The proposal in this case does not qualify as a Schedule 1 development and is not located within or close to a Sensitive Area. It is, however, of a type and scale that falls within Schedule 2(10) 'Infrastructure Projects' - specifically 10(b) 'Urban Development Projects'. The scale of the proposed development exceeds the applicable threshold of 150 dwellings and therefore constitutes Schedule 2 development.

4.4 Schedule 2 development only requires EIA if it is likely to give rise to significant effects, which is determined by applying the criteria set out in Schedule 3 of the Regulations. In this case, the LPA was asked for its Screening Opinion in relation to a previous version of the development. This Opinion, issued on 6th June 2017, confirmed that EIA would be required (Planning Reference S/1714/17/E1).

4.5 Although the nature of the development has since changed, including a reduction in the site area, it still exceeds the applicable threshold in the Regulations. A likelihood that it could give rise to significant effects is therefore considered to remain, and the applicant has elected to carry out an EIA on that basis.

Scoping

4.6 This document sets out the suggested scope of the EIA and structure of the associated ES. It informs a request for a Scoping Opinion from SCDC in line with Regulation 15 of the EIA Regulations. It has been informed by the Scoping Opinion issued for the previous version of the scheme in October 2020.

4.7 In accordance with Regulation 15(2), this request includes:

- a plan sufficient to identify the land;
- a brief description of the nature and purpose of the development, including its location and technical capacity - see Sections 2 and 3;
- an explanation of the likely significant effects of the development on the environment: See Section 6 onwards; and
- such other information or representations as the person making the request may wish toprovide or make - see other sections of this Scoping Report, notably Section 4.

4.8 Guidance on scoping is provided in the National Planning Practice Guidance (NPPG), whichstates that:

"Whilst every Environmental Statement should provide a full factual description of the development, the emphasis should be on the "main" or ***"significant"*** *environmental effects to which a development is likely to give rise. The Environmental Statement should be proportionateand not be any longer than is necessary to assess properly those effects.* ***Where, for example, only one environmental factor is likely to be significantly affected, the assessment shouldfocus on that issue only. Impacts which have little or no significance for the particular development in question will need only very brief treatment to indicate that their possiblerelevance has been considered"*** *(emphasis added) (Paragraph: 035 Reference ID: 4-035- 20170728).*

4.9 Table 4.1 sets out the broad aspects of the environment in Schedule 4 of the EIA Regulations, and identifies which topics are considered necessary to consider in this EIA, with a justification. Topics listed are those for which significant effects are considered likely or cannot be ruled out and have consequently been scoped into the EIA. Not all topics scoped into the EIA are considered to merit a full technical assessment in the form of an ES chapter. Some topics are therefore proposed to be "scoped down" such that they would be reported in the ES on a commentary level. Scoping has been based on the professional judgement of the EIA team andthe information currently available on the Proposed Development, the Site and the surrounding area.

4.10 Table 4.2 summarises those topics that are proposed to be scoped out of the EIA on the basis that they are unlikely to give rise to significant effects, together with a justification. Some of thesetopics may still be covered by technical reports that will be submitted in any event, but not as partof the ES. Table 4.3 synthesises Tables 4.1 and 4.2 to summarise the overall scope of the EIA.

Table 4.1: Consideration of Broad Environmental Topics

TOPIC	CONSIDERATION
Population and Human Health	

TOPIC	CONSIDERATION
Social Infrastructure (including health and open space)	The Proposed Development will introduce a substantial additional resident population to the area in the PRS dwellings that will require access to social infrastructure. It is likely that without further infrastructure the Proposed Development would have a significant effect. The proposed Maths College will be a substantive additional resource for the region which is likely to have a positive effect.
Economy and Employment	The Proposed Development will introduce a substantial additional resident population to the area that will require employment opportunities. The Proposed Development will also provide employment floorspace that will provide such opportunities but also create market opportunities for local businesses. It is likely that the overall effect will be significant on the local economy.
Tourism	The Proposed Development site is not located in an area with a large tourist economy. As such, it is unlikely to have a significant effect on tourism.
Human Health	It is proposed that a Human Health and Wellbeing assessment (adhering to the Rapid Heath Impact Assessment guidance published by the Health Urban Development Unit (HUDU)) (NHS 2017b) is prepared in support of the Proposed Development. The Health Impact Assessment is proposed to form a technical Appendix to the ES, supporting a technical chapter.
Flora and Fauna	
Ecology (including arboriculture)	The Site is disturbed land that has been recolonised to varying degrees to create a mosaic of habitats. Whilst these habitats are scarcely uncommon, they have value within an urban context, together with some potential to support protected species. The development will involve wholesale clearance of the site, except for peripheral areas that are not required for construction purposes. In view of the likely extent of habitat loss, together with the limitations on habitat creation imposed by the density of the development, a risk of significant effects cannot be discounted.
Soil and Water	
Ground Conditions (including contamination, stability and hydrogeology)	As former railway land, there is a possibility that soils and/or groundwater on the site could have been affected by contaminants such as hydrocarbons. Construction activities also pose a potential risk of contamination through accidental spillages.
Surface Water Drainage (including flood risk andwater quality	The site is not subject to a high risk of flooding. However, the development willchange the runoff characteristics across the greater part of the site, which will require the implementation of a drainage strategy based on sustainable principles.
Air and Climatic Factors	
Local Air Quality	Although existing air quality is not considered to be a limiting factor, this will need to be confirmed, particularly for the introduction of residential uses. Thedevelopment will introduce sources of airborne emissions such as traffic (both during construction and once completed).
Microclimate (Wind)	The massing of the Proposed Development is sufficient to create a potential riskto pedestrian comfort in some nearby streets and external spaces.
Microclimate (Daylight and Sunlight)	The massing of the Proposed Development is sufficient to have potential effectson natural lighting and overshadowing in nearby properties and external spaces.
Macroclimate/Climate Change	The development is likely to increase greenhouse gas (GHG) emissions fromthe site and will be expected to demonstrate that such emissions would be minimized through appropriate design and management measures in accordance with best practice and Building Regulations.

TOPIC	CONSIDERATION
Odour	Although the site is in relatively close proximity to the Cambridge Water Recycling Centre, which is a known source of odour, recent studies indicate that the level of nuisance has decreased. In addition, residential uses (which are particularly sensitive to odour impacts) are not a component of this application.
Noise and Vibration	Background noise levels are influenced mainly by traffic and train movements,such that the suitability of the site for residential use is a consideration. In addition, the development will itself introduce sources of noise, during construction and from operational traffic and fixed plant.
Material Assets, including the Architectural and Archaeological Heritage	
Archaeology	Previous archaeological investigations of the Site have found no evidence tosuggest it has the potential to include archaeological remains.
Built Heritage	Whilst there are no built heritage assets within or in the immediate vicinity of the site, the surrounding area includes several Conservation Areas and listed buildings.
Transport	The Proposed Development will require amendments to highway infrastructure and has the potential to generate traffic, both during construction and once occupied.
Utilities (incl. energy and water supply)	Although the Proposed Development will create extra demand for utilities, this will be met by the relevant undertakers in accordance with their statutory powers. The impact of any off-site works will be assessed under each topic whererelevant.
Safeguarded Sites	The following safeguarded sites are located in the general vicinity of the Site: • Cambridge wastewater treatment works; • Chesterton Junction aggregates railhead; and • Veolia commercial waste depot, Cowley Road.
Landscape	
Landscape and Views	The Proposed Development will introduce buildings of substantial scale onto acurrently vacant site, which has the potential to affect the local townscape andviews.
The Inter-Relationship between the Above Factors	
Secondary Effects	Some potential for in-combination effects on nearby receptors (e.g. noise anddust emissions during construction).

Table 4.2 Scoping Matrix

(Shaded calls denote topics proposed to be scoped in)

	CONSTRUCTION		OPERATION	
	LIKELY TO BE SIGNIFICANT?	SCOPE IN/OUT	LIKELY TO BE SIGNFICANT?	SCOPE IN/OUT
Population and Human Health				
Social Infrastructure	No	Out	Yes	In
Economy and Employment	Yes	In	Yes	In

	CONSTRUCTION		OPERATION	
	LIKELY TO BE SIGNIFICANT?	SCOPE IN/OUT	LIKELY TO BE SIGNFICANT?	SCOPE IN/OUT
Health	No	Out	Yes	In
Biodiversity				
Ecology	Yes	In	Yes	In
Arboriculture	No	Out	No	Out
Land, Soil and Water				
Ground Conditions (including contamination, stability and hydrogeology)	Yes	In	Yes	In
Surface Water Drainage (including flood riskand water quality)	Yes	In	Yes	In
Air and Climate				
Local Air Quality	Yes	In	Yes	In
Microclimate (Wind)	No	Out	Yes	In
Microclimate (Daylight and Sunlight)	No	Out	Yes	In
Climate change (including greenhouse gas emissions and resilience)	Yes	In	Yes	In
Odour	No	Out	No	Out
Noise and Vibration	Yes	In	Yes	In
Material Assets, Cultural Heritage and the Landscape				
Archaeology	No	Out	No	Out
Built Heritage (setting only)	No	Out	Yes	In
Transport	Yes	In	Yes	In
Utilities (including energy & water supply)	No	Out	No	Out
Landscape and Visual Amenity	Yes	In	Yes	In

	CONSTRUCTION		OPERATION	
	LIKELY TO BE SIGNIFICANT?	SCOPE IN/OUT	LIKELY TO BE SIGNFICANT?	SCOPE IN/OUT
Obtrusive Lighting	No	Out	TBC	In
Safeguarded Sites	No	Out	TBC	In
The interaction between the factors referred to above				
None identified	No	In	No	In
Vulnerability to Accidents/Disasters that are not included above				
None identified	No	Out	No	Out

4.11 The proposed assessment topics and nominated consultants are set out in Table 4.3 below.

Table 4.3 Proposed Assessment Topics Consultants

TOPIC	CONSULTANT
Air Quality	PJA/Temple
Climate Change	Arup
Cultural Heritage	Turley
Ecology	RPS
Flood Risk and Drainage	PJA
Human Health	Bidwells
Landscape and Visual	Bidwells
Lighting	Arup
Noise and Vibration	PJA
Odour	Arup
Socio-Economics	Bidwells
Soils and Groundwater	PJA
Transport	PJA
Wind	Arup

4.12 The proposed scopes and methodologies for the topics that are to be fully assessed (i.e. eachwith their own ES chapter) are provided in Section 6 onwards of this report, together with a justification for scoping out Odour as an EIA topic (Chapter 16).

4.13 It should be noted that, whilst Safeguarded Sites are scoped into the assessment, they will not be the subject of a full assessment chapter comparable with other topics. These sites will be addressed in the assessment of other topics where relevant (e.g. in relation to noise or fugitive dust emissions), on the basis of which a commentary-level assessment will be provided of any risk that the proposed development may pose to the continued operation of these sites.

4.14 The EIA Regulations require that EIAs are conducted by competent experts. The ES will providea statement of the expertise and qualifications of such experts. It is confirmed that the Scoping Report has been prepared by competent experts, and further details will be provided in the ES.

The Environmental Statement will contain all the information required by EIA Reg 18 and Schedule 4, subject to the precise scope agreed on the basis of this report.

EIA Methodology

4.15 The identification of the likely significant effects of the Proposed Development will be based on consideration of:

- the likelihood, character (direct, indirect, secondary or cumulative), duration (frequency, short, medium and long term, permanent or temporary) and importance of the impacts;
- the environmental sensitivity of relevant resources/receptors; and
- any quantified thresholds or indicative criteria set out in Government Regulations and Policy Guidelines.

4.16 Where quantifiable criteria are not used, clearly defined qualitative criteria and expert judgement will be applied. A standard methodology for determining effect significance is provided below under “significance criteria”.

4.17 Following the identification of the potential effects, mitigation will be developed to avoid, reduce or compensate for adverse effects. In general, ES mitigation can include:

- Measures relied upon which are part of the design, and thus for approval under the planning application. These include modifications to the location or design of the proposals at pre-consent stage. IEMA (2016) refers to these as “inherent” mitigations.
- Measures which need to be secured at a later stage, such as through a condition or planning obligation. These can be called “foreseeable” mitigation. Examples of these are provision of community infrastructure, adherence to noise limits, or management through a plan which has not yet been produced (such as provision of a Construction Environmental Management Plan (CEMP), with details to be agreed by condition).
- Measures which will be undertaken to meet other existing legislative requirements, or standard practice used to manage commonly occurring environmental effects. An example of these measures is adherence to emission control measures required under parallel consenting regimes, or standard considerate contractor practices to manage possible construction nuisances. These can be called “tertiary” mitigation.

4.18 Where mitigation is relied on in the ES, it will be identified according to type, with the mechanisms for securing mitigation noted, and where possible who is responsible for delivery, and timescales, including how they would be controlled by the competent authority. Residual effects are those remaining following implementation of the identified mitigation measures.

Significance Criteria

4.19 Each assessment topic will define its own assessment methodology to determine the likely significance of environmental effects, in accordance with relevant guidance. To provide consistency, generic significance criteria will be provided as a framework methodology. The relevance of these generic criteria to the individual assessment will be stated in the ES; for example, current guidance for ecological impact assessment (CIEEM 2016) discourages the use of

a matrix approach. The proposed generic assessment criteria are provided below. Table 4.5 sets out a typical approach to categorizing the sensitivity of the resources/receptors.

4.20 Effects arise from changes of specific magnitude to receptors/resources of assumed sensitivityand can be beneficial or adverse. Table 4.6 below sets out a typical approach to the categorization of magnitude of change.

4.21 By combining the value of each receptor and/ or resource and the magnitude of the change (impact) resulting from the Proposed Development, an assessment will be made of the significance of the effect. A typical approach is set out in Table 4.7 below. However, this is not amechanistic process; significance depends to a large degree on professional judgement, reflecting factors such as the spatial frame of reference. Terms and assumptions will be clearly set out in the ES so that the process is as transparent as possible.

4.22 For most topics, not all effects will be significant in EIA terms. Typically, those falling within the "upper end" of the spectrum of effects (i.e. moderate to major, to use the terminology adopted here) should be regarded as significant. Where any such effects are adverse, opportunities should be sought to avoid, reduce or otherwise mitigate them.

Table 4.5 Typical Categorization of Resource/Receptor Sensitivity

VALUE	SENSITIVTY	CHARACTERISTICS
International /National	VERY HIGH	Extremely rare (endangered), potentially extremely vulnerable to change, of international importance or recognition, very limited potential for substitution. For example, World Heritage Site, RamsarWetland etc.
National	HIGH	Rare, resources and receptors of National Importance or recognition, limited potential for substitution, highly vulnerable tochange, protected in national legislation. For example, Sites of Special Scientific Interest, National Parks, Grade I and Grade II*Listed Buildings and Scheduled Ancient Monuments.
Regional/ County/ District:	MODERATE	Resources and receptors are somewhat rare or vulnerable and difficult to substitute. Resources and receptors of Regional, County or District Importance E.g. Regional and Country Wildlife, Grade II Listed Buildings.
District / Local	LOW	Locally important, difficult to substitute at a local level, rare or unusual at the local level but well represented elsewhere. Forexample, Local Nature Reserves, Locally Listed Buildings etc.
Local:	VERY LOW	Resources and receptors which are of limited importance or value, not vulnerable to change, can be readily substituted and/or which have been partially destroyed. e.g. undesignated buildings of somelimited historical significance.

Table 4.6 Typical Approach to the Categorization of Magnitude of Change

MAGNITUDE	CHARACTERISTICS OF CHANGE
Major Beneficial	The Proposed Development would remove features that adversely affect the existing environment, prevent further degradation, and enhance and protect the environment inthe long-term.
Moderate Beneficial	The Proposed Development would notably reduce rate of current degradation and/ orenhance existing character.

	Minor Beneficial	The Proposed Development would reduce rate of current degradation.
	None	The Proposed Development would not result in any meaningful change to the receptor/resource.
	Minor Adverse	The Proposed Development would increase the rate of current degradation or introducesome minor detractors into the environment.
	Moderate Adverse	The Proposed Development would result in the partial loss of a resource or notablydegrade a receptor environment.
	Major Adverse	The Proposed Development would result in the complete loss of a resource or compromise the integrity of a receptor such that its long-term survival is highly unlikely.

Table 4.7 Significance Matrix

Magnitude of Change	BASELINE SENSITIVITY: VERY HIGH	HIGH	MODERATE	LOW	VERY LOW
Major Beneficial	Major Beneficial	Major-Moderate Beneficial	Moderate Beneficial	Moderate/Minor Beneficial	Minor Beneficial
Moderate Beneficial	Major-Moderate Beneficial	Moderate Beneficial	Moderate/Minor Beneficial	Minor Beneficial	Minor/Negligible Beneficial
Minor Beneficial	Moderate Beneficial	Moderate/Minor Beneficial	Minor Beneficial	Minor/Negligible Beneficial	Negligible
Neutral	Negligible	Negligible	Negligible	Negligible	Negligible
Minor Adverse	Moderate Adverse	Moderate/Minor Adverse	Minor Adverse	Minor/Negligible Adverse	Negligible
Moderate Adverse	Major-Moderate Adverse	Moderate Adverse	Moderate/Minor Adverse	Minor Adverse	Minor/Negligible Adverse
Major Adverse	Major Adverse	Major-Moderate Adverse	Moderate Adverse	Moderate/Minor Adverse	Minor Adverse

4.23 The following terms are suggested for guidance in categorizing the significance of effects:

- **Major beneficial or adverse significant impact** - where the development would cause agreat improvement (or deterioration) to the existing environment;
- **Moderate beneficial or adverse significant impact** - where the development would causea noticeable improvement (or deterioration) to the existing environment;
- **Minor beneficial or adverse impact** - where the development would cause a small or barely perceptible improvement (or deterioration) to the existing environment; and
- **Negligible** - no discernible improvement or deterioration to the existing environment.

4.24 Each identified receptor/ feature will be defined in terms of its importance/ value, or sensitivity to change. In some cases, this may include a geographic scale, such as in ecology and archaeology assessments. However, a geographic scale would not be appropriate for more localised effects such as noise and air quality.

4.25 Each effect will be identified as either beneficial or adverse. For some topics (e.g. landscape and views) an impact may give rise to effects that are both beneficial and adverse (e.g. an attractive building obstructing a view). Where these implications are evenly balanced, the net effect may be neutral.

4.26 Each effect will be defined as a direct, indirect or cumulative result of the Proposed Development on an identified receptor/ feature and will be described in terms of:

- The magnitude of change; and/ or
- The loss in capacity (such as highway junctions); and/ or
- The risk of breaching a recognised environmental threshold (such as air quality objectives).

4.27 Each effect will be described in terms of its duration. Where appropriate, further description will be used, e.g. short/medium/long term, temporary/permanent, continuous/intermittent, reversible / irreversible. Where there is uncertainty, a realistic worst-case approach will be adopted.

Baseline Scenarios

4.28 The assessment will consider the existing baseline (i.e. conditions at the time of assessment), future baselines for construction (i.e. existing baseline + any foreseeable changes to start of work) and operation (i.e. baseline as modified by construction), as appropriate. Baselines will be defined in the individual chapters and may vary between topics.

Monitoring

4.29 The need for monitoring of likely significant effects will be considered. Details of suggested monitoring activities will be recommended if needed. This will ensure that the type of parameters to be monitored and the duration of the monitoring are proportionate to the nature, location and size of the Proposed Development and the significance of its effects. Avoidance of duplication of monitoring will be a consideration, and any existing suitable monitoring arrangements identified. The effectiveness of mitigation measures and the need for potential remedial action will also be considered.

Alternatives

4.30 The EIA Regulations require “reasonable alternatives” to be addressed. These are alternatives considered by the applicant during the course of project planning and design. Alternatives are likely to be limited to matters of quantum, use and design, as site alternatives have already been considered through the local plan allocation process. Reasons for the selection of the final design will be provided, with regard to environmental considerations.

Consultation

4.31 The scope of the EIA will be agreed with relevant consultees and authorities; this Scoping Report provides a key first step in this regard. Where appropriate, comments from the public will be taken into account in the assessments. A summary of how consultation has influenced the EIA will be provided in the ES.

References

IEMA. 2016. Environmental Impact Assessment Guide to Delivering Quality Development. Available at https://www.iema.net/assets/newbuild/documents/Delivering%20Quality%20Development.pdf (accessed 30/5/18)

5.0 Cumulative Effects

Introduction

5.1 The EIA Regulations require an ES to consider the “cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating toareas of particular environmental importance likely to be affected or the use of natural resources." Schedule 4, 5(e).

5.2 Cumulative effects can fall into two types:

- Intra-project cumulative effects: Interactions between environmental topics (such as the effects of transport-related air quality impacts on biodiversity receptors), or between different aspects of the Proposed Development (such as the combined implications of the housing and roads infrastructure).
- Inter-project cumulative effects: Interactive effects with other developments beyond the Proposed Development.

Approach

5.3 No cumulative impact assessment guidance methodology exists for EIA within the Town and Country Planning regime. An approach has therefore been developed based on approaches used in other types of EIA (such as infrastructure, as in Planning Inspectorate 2015), as well as professional experience.

5.4 In addition to the requirements of the EIA Regulations, relevant guidance includes Natural England’s standard consultation response (2019), which requires consideration of:

- Existing completed projects (i.e. already forming part of the baseline);
- Approved but uncompleted projects;
- Ongoing construction works; and
- Plans or projects that are reasonably foreseeable, i.e. projects for which an application hasnot yet been submitted but which are likely to progress before completion of the development.

5.5 A proportionate assessment to cumulative effects will be taken, based on the level of information available. The assessment will include consideration of cumulative impacts with completed and under-construction development within the Cambridge North allocation, as well as approved developments in the surrounding area that have the potential to alter baseline conditions or to interact with this development.

5.6 Inter-project cumulative effects outside the allocation site will be assessed for inclusion in the EIA in a two-stage process. Firstly, a long-list of possible cumulative projects will be compiled, and a screening assessment undertaken to identify projects for which significant interactive effects are likely to occur. Where this exercise identifies a potential for significant cumulative effects, they will be taken forward for more detailed assessment as part of the technical assessments undertaken in the EIA.

5.7 Potential cumulative developments are likely to comprise both existing and approved projects in line with the requirements of the EIA Regulations, and projects in the pre-consent phase. Therewill be less information available for the latter, and consequently a higher-level assessment will be undertaken. The following criteria have been applied to identify other developments where significant cumulative effects are likely:

- Developments within relevant zones of influence of the Proposed Development (which willvary between topics);
- Planning applications within these zones of influence during the last two years which meetthe criteria outlined;
- Development that is expected to be constructed at the same time as the Proposed Development;
- Major development (>150 units, site areas over five hectares, 10,000 sqm of non-residential flood space, infrastructure development);
- EIA development (which is likely to have significant effects in its own right); and/or
- Development which introduces sensitive receptors in close proximity to the Site (whilst acknowledging that the “agent of change principle” means the introducer of any sensitive receptors is responsible for assessing impacts on them).

5.8 Based on the advice in the previous (October 2020) Scoping Opinion, a planning search has been carried out to identify potential developments within a 2km radius. A provisional schedule of cumulative schemes is attached as Table 5.1; the LPA are need to confirm their agreement to this in their Scoping Opinion. The development types are broken down as follows:

- Development within relevant zones of influence of the proposed development;
- Development that is expected to be constructed at the same time as the proposed development;
- Major Development (<150 units, site areas over five hectares, 10,000sqm of non-residential floor space, infrastructure development);
- EIA development;
- Development which introduces sensitive receptors in close proximity to the site.

PLANNING APPLICATION TYPE	APPLICATION NAME	SITE ADDRESS AND DISTANCE FROM SITE	ZONES OF INFLUENCE	SAME CONSTRUCTION TIMES	MAJOR DEVELOPMENT	EIA DEVELOPMENT	SENSITIVE RECEPTORS
Major development with planning consent which is either under construction or not yet commenced.	**21/02450/REM** Reserved matters application 421 new homes with associated infrastructure, internal roads and open space	**Address:** Land North of Newmarket Road Cambridge CB5 8AA **Distance from Site:** 1.94 km	✓	✓	✓	✓	
Major development where a planning application has been submitted and information is in the public domain, but the application has not yet been determined.	**20/03524/FUL** Upgrade to existing access roads and Cowley Road (as part of a wider proposal **20/03523/FUL** for the erection of a 5-storey building and a 6-storey building for commercial/business purposes, erection of a transport hub, gymnasium, surface parking, landscaping and associated infrastructure including demolition of the existing building (St John's House) and associated structures).	**Address:** Land in The North West Part of The St Johns Innovation Park Cowley Road Cambridge CB4 0WS **Distance from Site:** 1.36 km	✓		✓		
Major development proposals currently at scoping stage	**21/04640/SCOP** | Request for a Formal Scoping Opinion for an Order granting Development Consent for the Cambridge Wastewater Treatment Plant Relocation (the Proposed Development) | Cambridge Waste-Water Treatment Plant Relocation Horningsea Road Fen Ditton Cambridgeshire	**Address:** Cambridge Waste Water Treatment Plant Relocation, Horningsea Road Fen Ditton Cambridgeshire **Distance from Site:** 0.88 km	✓	✓	✓		
	17/1616/CTY | EIA Scoping Opinion | Waterbeach New Town	**Address:** Waterbeach New Town Waterbeach Barracks			✓	✓	

PLANNING APPLICATION TYPE	APPLICATION NAME	SITE ADDRESS AND DISTANCE FROM SITE	ZONES OF INFLUENCE	SAME CONSTRUCTION TIMES	MAJOR DEVELOPMENT	EIA DEVELOPMENT	SENSITIVE RECEPTORS
	Waterbeach Barracks and Airfield Site Waterbeach Cambridgeshire	and Airfield Site Waterbeach Cambridgeshire **Distance from Site:** 6.36 km					

Methodology for Assessing Cumulative Effects

5.9 The methodology for assessing cumulative effects will be set out in the ES in detail. This will draw on standard EIA methodologies, as summarised in the following sections of this ScopingReport. Intra-project cumulative effects will be assessed in each technical chapter as appropriate. Where other projects are in the public domain, available information will be collected, and an assessment of likely significant effects will be undertaken.

References

The Planning Inspectorate. (2015). Advice note seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/12/Advice-note-17V4.pdf.

6.0 Air Quality

Introduction

6.1 The Air Quality Assessment will be undertaken by Temple Group Ltd; the project lead has an integrated masters level degree in Environmental Science, is a member of the Institute of Environmental Sciences and the Institute of Air Quality Management and has over nine years of professional experience in the field of air quality; including the preparation of Environmental Statement (ES) chapters and assessments of mixed use and commercial developments.

Baseline Conditions

6.2 Information on air quality in the UK can be obtained from a variety of sources, including local authorities, national network monitoring sites and other published sources. For the purposes of this assessment, data has been obtained from the Defra Air Quality Information Resource (AIR), Cambridge City Council (CCC) and South Cambridgeshire District Council (SCDC). The most up-to-date monitoring data will be requested from the relevant local authorities at the time of assessment.

6.3 There are two Air Quality Management Areas (AQMAs) in the vicinity of the Proposed Development: the Cambridge AQMA and the A14 Corridor AQMA.

6.4 The Cambridge AQMA is located approximately 1.2km to the south-east of the Proposed Development and was declared in 2004 by CCC due to exceedances of the annual mean for nitrogen dioxide (NO_2) objective. The Cambridge AQMA encompasses the Cambridge inner ring road and all land within it. The A14 Corridor AQMA is located approximately 1.6km north-west of the Proposed Development and was declared in 2008 by SCDC due to exceedances of annual mean NO_2 and daily mean particulate matter (PM_{10}). The A14 Corridor AQMA encompasses the A14 between junction 33 and junction 25 between Milton and Bar Hill.

Local Authority Automatic Monitoring

6.5 CCC operates five automatic roadside monitoring stations with the closest of these five monitors approximately 1.8km away from the Proposed Development. However, none of these locations are representative of the Proposed Development or study area and data from them have not been presented.

6.6 SCDC operate three automatic monitoring stations within their district, with the closest of these three monitors approximately 3km away from the Proposed Development. However, none of these locations are representative of the Proposed Development or study area and data from them have therefore not been presented.

Diffusion Tube Monitoring

6.7 CCC undertakes diffusion tube monitoring at 69 sites across Cambridge. Table 6.1 presents the most recent results for diffusion tubes within the vicinity of the Proposed Development. No monitoring sites are considered to fully represent the Proposed Development, as they are primarily

located close to busy A roads, monitoring higher concentrations. Table 6.1 demonstrates that concentrations are well below the NO_2 annual mean objective (defined in Table 6.3), even at kerbside locations.

Table 6.1 Diffusion tube monitoring data (NO_2) in vicinity of Proposed Development

SITE ID	SITE NAME	SITE TYPE	NATIONAL GRID REFERENCE		ANNUAL MEAN CONCENTRATION (µG/M3)		
					NO2		
			X	Y	2017	2018	2019
DT8	Milton Road	Roadside	545977	260352	19	18	18
DT12	Newmarket Road 2	Roadside	547998	259349	28	25	23
DT30	Arbury Road	Kerbside	545693	260473	18	17	18
DT37	OaktreeAvenue	Urban Background	545885	260088	16	15	15
DT61	Newmarket Road 3	Roadside	546341	258882	N/A	33	34

Source: CCC ASR 2020.

6.8 SCDC undertakes diffusion tube monitoring at 31 sites within its district. However, none of these locations are representative of the Proposed Development as they are greater than 2km from the Proposed Development and data from them have therefore not been presented.

Defra Projected Background Concentrations

6.9 Defra provides estimates of background pollution concentrations for NOX, NO2, PM10 and PM2.5 across the UK for each one-kilometre grid square, for every year from 2018 to 2030. The maps include a breakdown of future background concentrations by emission source, including road and industrial sources, which have been calibrated against 2018 UK monitoring data.

6.10 The background concentrations for the 1km grid square containing the Proposed Development in 2021 and 2025 (the earliest year of operation) are presented in Table 6.2. The data shows that the maximum background concentrations are all within the relevant objectives.

Table 6.2: Projected background concentrations (µg/m^3) of pollutants (maximum concentrations across Proposed Development area)

RECEPTOR LOCATION OS GRID REFERENCE		2021				2025			
X	Y	NO_2	NO_x	PM_{10}	$PM_{2.5}$	NO_2	NO_x	PM_{10}	$PM_{2.5}$
547500	260500	10.8	14.2	14.4	9.5	9.4	12.3	13.7	8.9

Source: https://uk-air.defra.gov.uk/data/laqm-background-maps

Summary

6.11 Annual mean NO2 concentrations monitored from 2017 – 2019 (the latest years for which monitoring data are available) met the annual mean NO2 air quality objective. Defra's TG16 indicates that the hourly NO2 air quality objective of 200µg/m3 (not to be exceeded more than 18

times per year) is unlikely to be exceeded at roadside locations where the annual mean concentration is less than 60µg/m3. Following this guideline, the hourly objective is therefore considered likely to also be met at these locations.

6.12 The Defra background map predictions indicate that background concentrations at the Proposed Development sitemeet the annual mean air quality objectives relating to NO_2 and fine particulate matter (PM_{10} and $PM_{2.5}$), the pollutant most likely to be generated in connection with the Proposed Development.

6.13 Overall, air quality at the Proposed Development and the area surrounding is considered to meet the relevant air quality objectives.

Potential Impacts

6.14 The Proposed Development may result in the following potential effects on local air quality:

Construction phase

- Effects associated with dust and PM_{10}, with the potential to cause a loss of amenity and health impacts at nearby sensitive receptors; and
- Impacts on local air quality as a result of traffic-related emissions generated by construction traffic.

Operational phase

- Impacts on local air quality as a result of changes in traffic- and plant-related emissions associated withthe Proposed Development.

Approach and Method

Legislative Context

6.15 Applicable numerical limit values and objectives for the Proposed Development are summarised in Table 6.3, hereafter referred to as air quality objectives.

6.16 It should be noted that the UK air quality objectives only apply at locations where members of the public might reasonably be exposed to pollutants for the respective averaging periods. Table 6.4 provides details of where the respective objectives should and should not apply, and therefore the types of receptors that are relevant to the assessment.

Table 6.3 Relevant Air Quality Standards

POLLUTANTS	AVERAGIN G PERIOD	AIR QUALITY OBJECTIVES AND LIMIT VALUES		ATTAINMENT DATE
		CONCENTRATION	ALLOWANCE	
Nitrogen Dioxide (NO_2)	1-hour	200 µg/m^3	18 per calendar year(c)	31 December 2005(a) 1 January 2010(b)

POLLUTANTS	AVERAGIN G PERIOD	AIR QUALITY OBJECTIVES AND LIMIT VALUES		ATTAINMENT DATE
		CONCENTRATION	ALLOWANCE	
	Annual	40 µg/m^3	-	31 December 2005(a) 1 January 2010(b)
Particulates (PM_{10})	24-hour	50 µg/m^3	35 per calendar year(d)	31 December 2004(a) 1 January 2005(b)
	Annual	40 µg/m^3	-	31 December 2004(a) 1 January 2005(b)
Particulates ($PM_{2.5}$)	Annual	25 µg/m^3	-	1st January 2015(b)

Notes:
(a) Air Quality (England) Regulations 2000 as amended.
(b) EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe and The Air Quality Standards Regulations 2010. Derogations (time extensions) have been agreed by the EU for meeting the NO_2 limit values in some zones/agglomerations.
(c) Can be expressed as the 99.79th percentile of 1-hour means.
(d) Can be expressed as the 90.41st percentile of 24-hour means.

Table 6.4 Locations where the Air Quality Objectives Apply

AVERAGING PERIOD	OBJECTIVES SHOULD APPLY AT:	OBJECTIVES SHOULD NOT APPLY AT:
Annual	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
24-hour	All locations where the annual mean objectivewould apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locationsat the building façade), or any other location where public exposure is expected to be short-term.
1-hour	All locations where the annual mean and 24 mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably be expected to spendone hour or longer.	Kerbside sites where the public would not be expected to have regular access.

Source: Defra LAQM TG16

Construction phase

6.17 The assessment of effects during the construction phase will involve a review of the proposed activities and related traffic movements to identify any potentially adverse effects at nearby sensitive receptors.

6.18 Construction activities can result in temporary effects from dust. 'Dust' is a generic term which usually refers to airborne particulate matter in the size range 1-75 microns in diameter; the most common effects from dust emissions are soiling and increased ambient PM10 concentrations. Dust can be mechanically transported either by wind or re-suspension by vehicles. It can also arise from wind erosion on material stockpiles and earth-moving activities. The effects of construction dust will be identified using the qualitative approach described in the Institute of Air Quality Management's (IAQM) Guidance on the assessment of dust from demolition and construction, V1.1, 2014

6.19 IAQM and Environment Protection UK (EPUK) guidance on land-use planning and development control: planning for air quality V1.2 (2017) notes that impacts from exhaust emissions from on-site plant are unlikely to be significant. Given the local and temporary nature of site plant, the effects of plant emissions on local air quality are considered to be of negligible significance. Construction plant emissions will not therefore be assessed explicitly. Nevertheless, mitigation measures to reduce the effect of site plant on local air quality may be identified. Construction traffic flows will be screened against the criteria presented in the above guidance, and if required would be assessed following the same dispersion modelling method as adopted for the operational phase assessment.

Operational phase

6.20 This assessment will consider the potential for the Proposed Development to impact local air quality at existing human receptor locations. Due to the increase in traffic attributable to the Proposed Development, we propose to undertake a dispersion modelling assessment to assess the effects using the ADMS Roads dispersion modelling software. The receptor locations will be selected at existing locations representative of relevant exposure, including at worst-case locations, using the criteria shown in Table 6.4.

6.21 Insofar as relevant information is available, on-site sources of energy provision will be screened using the method outlined in the IAQM and EPUK guidance, 2017. Where one or more of the screening criteria are exceeded in relation to these elements, these will be included within the dispersion modelling assessment.

6.22 The effects of changes to traffic emissions on local air quality will be assessed using the latest ADMS-Roads dispersion modelling software, following Defra, Local Air Quality Management Technical Guidance, 2016 (LAQM TG.16) and using data from the nearby Cambridge meteorological site would be undertaken. The operational road traffic assessment will focus on NO2 and fine particulate matter (PM10 and PM2.5), as these are the main pollutants associated with traffic emissions and are the focus of nearby AQMAs. The latest Emission Factor Toolkit from Defra will also be used to calculate emissions for the opening year 'without' and 'with' the Proposed Development.

6.23 The ADMS-Roads model will be verified against existing monitoring data for the area where available.

6.24 The scoping opinion for the responses received from SCDC states the need to consider the air quality impacts form nearby industrial/commercial processes which hold an Environmental Permit issued by the Local Authority or Environment Agency. The air quality assessment would discuss air quality impacts from other nearby installations should the information be provided to Temple in a timely manner from the respective organisations. Such assessment is likely to be qualitative.

6.25 The assessment will also consider guidance from CCC's Supplementary Planning Document (SPD) Sustainable Design and Construction, 2007 and the Greater Cambridge Sustainable Design and Construction Supplementary Planning Document, 2020.

Consultation

6.26 SCDC and CCC's Environmental Health Officers will be consulted to confirm the scope of the assessment and the methodology proposed, and to request the latest monitoring data for the Proposed Development.

References

Cambridge City Council (2020) Local Air Quality Management Annual Status Report (ASR).

Department for Environment, Food and Rural Affairs (Defra), (2018) Defra Background Pollutant Concentration Maps. Available online at: https://uk-air.defra.gov.uk/data/laqm-background- maps?Year=2018.

Department for Environment, Food and Rural Affairs (Defra) (2018) Local Air Quality Management.

– Technical Guidance (16).

Environmental Protection UK and Institute of Air Quality Management (2017) Land-Use Planning and Development Control: Planning for Air Quality (version 1.2).

Holman et al (2019). A guide to the assessment of air quality impacts on designated nature conservation sites – version 1.0, Institute of Air Quality Management, London.

Institute of Air Quality Management (2014) Guidance on the assessment of dust from demolition and construction.

South Cambridgeshire District Council (2021) Local Air Quality Management Annual Status Report (ASR).

The European Parliament and the Council of the European Union (2008) Directive 2008/50/EC of the European Parliament and of the Council.

7.0 Climate Change

Introduction

7.1 The ES will identify any likely significant effects of the Proposed Development on Climate Change. The assessment will be undertaken by Ove Arup and Partners Limited, who have extensive experience in the preparation of these assessments, are chartered environmentalists or members of the Institute of Environmental Management and Assessment (IEMA) and are therefore considered to be 'competent experts' as per the requirements of the 2017 EIA Regulations[1].

7.2 The carbon assessment is concerned with the likely significant effects relating to carbon emissions arising from the Proposed Development. This includes emissions that are expected to occur during the construction and operational phases of the proposed development.

7.3 Climate change may have impacts on environmental and community receptors and resources within the area of the proposed development. Some of these impacts may be exacerbated by the construction of the proposed development. This is the basis for an in-combination climate change impact (ICCI) assessment of the effects of the proposed development on the receiving environment and community during construction and operation. The assessments will be carried out by each topic scoped into the assessment, with support from the climate change consultants, by consideration of future baseline conditions which make assumptions as necessary regarding climate change. The ICCI assessment will be reported in the climate change chapter.

7.4 Climate change may also result in an increase in weather-related hazards and impacts which could pose risks to the proposed development over its lifetime. This is the basis for a climate change resilience (CRR) assessment of the design, construction and operation of the proposed development.

7.5 It is a requirement of the EIA Regulations that climate change be considered in terms of the effects of the project on climate change such as the release of carbon emissions, as well as thevulnerability of the project to the impacts of climate change. IEMA has published guidance to support the assessment of these aspects of climate change[1,2]

7.6 In summary, therefore, the assessment will consider:

- The combined effects of the proposed development and potential climate change on the receiving environment and community (the ICCI assessment); and
- The resilience of the proposed development to climate change impacts (the CRR assessment); and
- The assessment of likely significant effects relating to carbon emissions.

[1] UK Government (2017) Town and Country Planning Environmental Impact Assessment Regulations 2018 No. 571

Policy, Guidance and Legislation

ICCI and CRR Assessment

7.7 The European Union (EU) Environmental Impact Assessment (EIA) Directive 2011/92/EU[2],places a requirement on projects anticipated to have significant effects on the surrounding environment and communities to make a formal assessment of these effects.

7.8 The amended EIA Directive 2014/52/EU[3] identifies the important role that the EIA process can play in assessing climate change impacts and risks. It states that EIAs shall identify, describe andassess the direct and indirect significant effects of climate, and the risk of major accidents and/or natural disasters that are relevant to the project, including those caused by climate change.

7.9 The European Commission (EC) has prepared guidance to help Member States improve the way in which climate change is integrated within EIAs carried out under the Directive. This guidance includes climate change related guidance for screening and scoping, analysing evolving baseline trends, identifying alternative and baseline measures, monitoring and adaptive management. The amended Directive states that the vulnerability of projects to climate change should also be assessed within the EIA process. The EC guidance on integrating climate change into EIA recommends that alternatives and potential mitigation measures are considered at the planning and design stages to ensure, amongst other things, that projects are resilient to the impacts of climate change.

7.10 The EU has also released sector-specific guidance on the interface between climate change and infrastructure, including projected impacts and resilience levels. This working document accompanies the Communication 'An EU strategy for adaptation to climate change'[4] and provides further background material supportive of the narrative and arguments put forward in the Communication.

7.11 The UK Climate Change Risk Assessment (CCRA) 2017[5] was published in January 2017 and updated in 2021. This is the second CCRA to be published since the 2008 Climate Change Act[6] which requires the UK Government to publish a UK-wide climate change risk assessment every 5 years. The CCRA 2017 summarises observed and projected climate changes in the UK and categorises risks into urgency categories allowing for prioritisation of adaptation programmes. Potential risk mitigation measures are divided into sectors including natural environment and assets, infrastructure, business and industry, people and the built environment, and international dimensions, as well ascross-cutting issues.

[2] Directive 2011/92/EU Of the European Parliament and of the council (2011) http://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=CELEX:32011L0092
[3] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0052

[4] European Commission, 2013, An EU strategy for adaptation to climate change
[5] European Commission, 2013, Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment. http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf(accessed December 2019).

[6] Climate Change Act 2008, (c. 27). London, Her Majesty's Stationery Office.

7.12 The UK Adaptation Reporting Power (ARP) first and second rounds of reports[7] include the identification and examination of risks and impacts relevant to water, health and wellbeing, and natural environment, which are relevant for a range of EIA topics. The UK ARP grants the Government power to request organisations to report on their climate change related risks and to set out proposals for adapting to these risks.

7.13 The Adaptation Sub-Committee (ASC) reports to Parliament on the Government's progress in preparing the UK for the impacts of climate change, by delivering the National Adaptation Programme. The first ASC report to Parliament highlights that flooding remains one of the most serious current and future risks to the UK and that there is a need to consider the impacts on health from current and future high temperatures.

7.14 The Planning Practice Guidance section on climate change[8] focuses on the integration of adaptation and mitigation approaches within the planning process. It includes guidance on approaches to support sustainable development via 'win-win' solutions. This guidance introduces and defines the concept of green infrastructure as 'a network of multifunctional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities'.

7.15 The latest Environment Agency advice on climate change and flood risk assessments[9] provides the climate change allowances and peak rainfall intensities to be considered in the assessment of climate change resilience. Similarly, Government guidance to local planning authorities on integrating adaptation and mitigation approaches to produce 'win-win' solutions that support sustainable development[10] are also relevant for this assessment.

7.16 Cambridge City Council (CCC) have produced a Climate Change Strategy[11] covering 2016-2021. CCC have identified the following objectives for this Climate Change Strategy, focusing on the areas where local authorities have most scope to influence carbon emissions:

- Reducing emissions from the City Council estate and operations;
- Reducing energy consumption and emissions from homes and businesses in Cambridge and tackling fuel poverty, by promoting energy efficiency measures, sustainable construction, renewable energy sources and behaviour change;
- Reducing emissions from transport by promoting sustainable transport, reducing car traveland traffic congestion and encouraging behaviour change;
- Reducing consumption of resources, increasing recycling and reducing waste; and
- Supporting Council services, residents and businesses to adapt to the impacts of climate change.

[7] https://www.gov.uk/government/collections/climate-change-adaptation-reporting-second-round-reports

(accessed December 2019).

[8] DCLG, 2014, Guidance: Climate Change. Available at:http://planningguidance.communities.gov.uk/blog/guidance/climate-change/how-can-adaptation-and-mitigationapproaches-be-integrated/ (accessed December 2019).

[9] Environment Agency, (Updated February 2016) Flood risk assessments: climate change allowances. Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances (accessedDecember 2019).

[10] Planning Practice Guidance, Climate Change Paragraph 4, 6-004-20140612 Available online at: http://planningguidance.communities.gov.uk/blog/guidance/climate-change/how-can-adaptation-and- mitigation-approaches-be-integrated / (accessed December 2019).

[11] Cambridge City Council (2016-2021). Climate Change Strategy https://www.cambridge.gov.uk/media/3230/climate_change_strategy_2016-21.pdf

7.17 In addition, the ICCI and CRR assessments will be informed by, but not limited to, the following legislation, planning policy and guidance:

- The Paris Agreement (2015)[12];
- The Climate Change Act 2008, as amended by the Climate Change Act (2050 Target Amendment) Order 2019[13];
- The National Planning Policy Framework[14];
- The Climate Change: second national adaptation programme (2018 – 2023)[15];
- The UK Clean Growth Strategy[16];
- The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations)[1];
- UK Nationally Determined Contribution (NDC) (2020)[17];
- Institute of Environmental Management and Assessment (IEMA) (2020) Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation18; and
- IEMA's Principles on Climate Change Mitigation and EIA[19];

Carbon

7.18 The carbon assessment will comply with the Draft North East Cambridge Area Action Plan (2020)[20], which details the following:

- Policy 2.c. states:
- *Development at North East Cambridge must support the transition to a net zero carbon society. Development must minimise carbon emissions associated with operational energy and construction, including materials, as well as wider emissions, for example those associated with transport. Development must be supported by decentralised renewable and low carbon energy combined with smart approaches to energy infrastructure including energy storage.*
- Policy 2.f. states:
- *All major new development must take into consideration the embodied carbon associated with materials using the RICS Whole Life Carbon approach or successor documents. Development must be designed to maximise resource efficiency and identify, source and use environmentally and socially responsible materials, giving consideration to circular economy principles and design for deconstruction.*

[12] Paris Agreement to the United Nations Framework Convention on Climate Change (2015)
[13] UK Government, The Climate Change Act 2008 (2050 Target Amendment) Order 2019. Queen's Printer of Acts of Parliament, 2019
[14] Ministry of Housing Communities and Local Government, "National Planning Policy Framework," 2019
[15] Department for Environment Food & Rural Affairs, "The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting Making the country resilient to a changing climate," 2018
[16] UK Government, "The Clean Growth Strategy Leading the way to a low carbon future," 2017
[17] UK Government (2020) United Kingdom of Great Britain and Northern Ireland's Nationally Determined Contribution.
Available from: *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/943618/uk-2030-ndc.pdf [Accessed 19 October 2021]*

[19] Institute of Environmental Management and Assessment (2010) Principles on Climate Change Mitigation and EIA
[20] North East Cambridge Area Action Plan (2020) Available at: https://www.greatercambridgeplanning.org/emerging-plans-and-guidance/north-east-cambridge-area-action-plan/

7.19 The carbon assessment will also take account of the Greater Cambridge Sustainable Design and Construction Supplementary Planning Document (2020)[21] which provides guidance on energy and carbon reduction in relation to planning applications and application requirements.

7.20 The assessment will consider the Cambridgeshire County Council CUPSE: Net Zero Cambridge report[22]. This report presents the historic carbon emissions for Cambridgeshire and Peterborough, the baseline and net zero emissions forecasts for various sectors, options for achieving negative emissions through afforestation and how the country could close the gap towards net zero.

7.21 In addition, the carbon assessment will be informed by, but not limited to, the following legislation, planning policy and guidance:

- IEMA Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissionsand Evaluating their Significance (2017)[23], and anticipated updated to this guidance;
- Guidance Document for PAS 2080 Carbon management in Infrastructure (2016)[24];
- BS EN 15978 Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method (2011)[25];
- BS EN 15804 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products (2012)[26];
- RICS (2017) Whole Life Carbon Assessment for the built environment (1st edition)[27];
- Cambridge City Council Carbon Management Plan 2016-2021[28]; and
- The South Cambridgeshire Local Plan (2018)[29].

Baseline Conditions

ICCI and CRR Assessment

7.22 Information regarding current and projected future climate conditions will be required for the ICCI and CCR assessments. Baseline conditions are assessed under the current climate conditions and each of the future climate scenarios for 2030-2049 and 2060-2079. Existing baseline climate conditions have been identified based on the latest 30-year averaging period of 1981-2010. These assessments will be desk based and no surveys are anticipated to be required.

7.23 Table 7.1 provides historic weather data for 1981-2010, from the Met Office weather station in Cambridge[30], 4.4 km north west of the proposed development. These values will be used as a

[21] Greater Cambridge Sustainable Design and Construction Supplementary Planning Document (2020) Available at: https://www.scambs.gov.uk/planning/local-plan-and-neighbourhood-planning/greater-cambridge-sustainable-design-and-construction-supplementary-planning-document-spd/
[22] Cambridgeshire County Council CUPSE: Net Zero Cambridge (2019) Available at: https://data.cambridgeshireinsight.org.uk/dataset/cambridgeshire-policy-challenges-cambridge-university-science-and-policy-exchange-cuspe-8
[23] IEMA (2017), Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions andEvaluating their Significance. Available at: https://www.iema.net/assets/newbuild/documents/IEMA%20GHG%20in%20EIA%20Guidance%20Docu ment%20V4.pdf
[24] PAS 2080:2016. (May 2016). Carbon management in infrastructure. [online]. Available at:www.bsigroup.com
[25] BS EN 15978:2011 Sustainability of construction works. Assessment of environmental performance ofbuildings. Calculation method. Available at: www.bsigroup.com
[26] BS 15804:2012 Sustainability of construction works. Environmental product declarations. Core rulesfor the product category of construction products. Available at: www.bsigroup.com

[27] Whole life carbon assessment for the built environment, RICS (November 2017). Available at: https://www.rics.org/globalassets/rics-website/media/news/whole-life-carbon-assessment-for-the--built- environment-november-2017.pdf
[28] Carbon Management Plan 2016-2021, Cambridge City Council. Available at:https://www.cambridge.gov.uk/carbon-management-plan
[29] South Cambridgeshire Local Plan, 2018. Available at: https://www.scambs.gov.uk/planning/local-plan-and-neighbourhood-planning/the-adopted-development-plan/south-cambridgeshire-local-plan-2018/
[30] Met Office, https://www.metoffice.gov.uk/public/weather/climate/gcpffxw47 (accessed 22/11/2021)

baseline for later comparison with future climate projections in the Cambridge area in the Environmental Statement (ES).

7.24 Additional information regarding regional, historical climate conditions and occurrence of extreme climate events will be sourced from other available sources (e.g. the HadUK-Grid gridded climate observations).

Future Climate Conditions

7.25 Future changes to the climate baseline will be identified for the operational life cycle stage, and will be used to provide a high-level, qualitative assessment of the proposed development' vulnerability to future climate change.

7.26 In accordance with IEMA Guidance, the climate projections will be taken from the UK Climate Projections 18[31] (UKCP18) high emissions scenario Representative Concentration Pathway (RCP) 8.5 (50% probability) 25km probabilistic projections.

Table 7.1: Historic weather data for Cambridge NIAB (4.4km north west of the proposed development).

MONTH	MAXIMUM TEMPERATURE (°C)	MINIMUM TEMPERATURE (°C)	DAYS OF AIR FROST (DAYS)	SUNSHINE (HOURS)	RAINFALL (MM)	DAYS OF RAINFALL ≥1 MM (DAYS)
January	7.3	1.6	9.4	58.3	46.6	10.5
February	7.7	1.3	9.9	77.1	34.5	8
March	10.6	3.1	5.2	110.7	38.3	9.6
April	13.3	4.3	2.8	152.5	41.2	8.8
May	16.9	7.1	0.4	179.4	46	8
June	19.9	10.2	0	176.7	51.5	8.9
July	22.8	12.4	0	187.6	47.5	8.3
August	22.6	12.4	0	182.6	50.8	8
September	19.3	10.4	0	139.5	53.5	8.4
October	14.9	7.6	1	113.9	59	9.4
November	10.3	4.2	4.3	66.7	52.8	9.8
December	7.5	1.9	9.8	49.3	46.4	9.8
Annual	14.5	6.4	42.8	1494.5	568.1	107.5

7.27 UK Climate Projections over the next 60 years show the following long-term seasonal averages and trends for the UK:

- Warmer, drier summers, particularly in parts of Southern England;
- Milder, wetter winters;

[31] UK Met Office. Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index

- An increase in annual average temperature;
- Fewer days with snow and frost;
- Increased likelihood of a higher frequency of very hot days;
- Increased likelihood of intense downpours of rain (particularly in summer); and
- An increase in dry spells.

7.28 Moreover, it is likely, although with increased uncertainty, that there will be a heightened probability of the following extreme weather events due to climate change:

- Short periods of intense cold weather (still expected due to natural variability); and
- An increase in the frequency of storms and high winds (generally considered as difficult to predict with any certainty).

7.29 Under the high emissions scenario, the average warming experienced in the UK could be as high as 5.4 °C in summer by 2070, with winters experiencing an increase of 4.2 °C. The high emissions scenario also predicts that on average the UK could experience a 35% increase in winter precipitation levels and a 47% decrease in summer precipitation levels. However, despite the decrease in overall precipitation volumes, projections indicate an increase in the intensity of heavy summer rainfall events. High or heavy rainfall events are linked to increased surface water on roads and an increased risk of flooding.

Carbon

7.30 The baseline for the carbon assessment is the reference point against which the impact of the Proposed Development can be compared and assessed. The baseline will reflect carbon emissions within the physical and temporal boundary of the Proposed Development, but without the Proposed Development.

7.31 Baseline carbon emissions associated with the embodied carbon of the current buildings on-site are considered to be zero as they have already occurred and are of a historical nature only.

7.32 The operational baseline carbon assessment will include the effects associated with the operational energy and traffic associated with the existing site, where appropriate. This will be assessed using information on current energy use on-site and current journeys to and from the site, where appropriate and available. Where energy use data is not available, baseline carbon emission will be estimated based on floor areas by type of use and assumptions regarding energy source (grid electricity, on-site combustion plant, etc.).

7.33 The operational baseline assessment will be assessed across the same study period as the proposed development, assuming the current site uses remain consistent. The baseline assessment will take into account any future decarbonisation trends where appropriate, in line with the assessment of the proposed development.

Potential Impacts

ICCI Assessment

7.34 This assessment will consider how the impacts of the proposed development on the receiving environment will be affected by future climate change, either directly or indirectly. The ICCI assessment can be considered to be an assessment of impacts against a future baseline that includes climate change. The ICCI assessment is most relevant to environmental receptors that are sensitive to weather and climate. The criteria for identifying significant effects in the ICCI assessment will be the same as the criteria applied under each topic for impacts under current climate conditions.

7.35 Given the nature of the proposed development, the following impacts will need to be considered in the ICCI assessment, as there is a potential for likely significant effects to:

- **Air quality**: Hotter and drier conditions could exacerbate dust generation and concentrations of certain air pollutants. Increased wind speed could influence dispersion of pollutants. Wetter conditions could suppress dust movement.
- **Contaminated land:** Increased temperatures may enhance landfill gas production, although lower moisture content associated with dry weather may reduce these gases. Warmer temperatures may also increase the release of volatile organic compounds causing unpleasant odours. Increased wind speeds may increase wind-blown dust. Increased frequency and intensity of rainfall and flooding may increase sediment runoff.
- **Cultural heritage:** Increased wind speeds, rainfall patterns and warmer temperatures could impact on designated landscape as a result of tree loss and changes to the growing season. Drought conditions could exacerbate the risk of ground settlement threatening archaeological sites and the foundations of buildings and dry out waterlogged remains.
- **Daylight and sunlight**: This assessment may be affected by a potential change in cloud cover brought about by climate change. However, significant uncertainty exists regarding future projections of cloud cover, and therefore potential in-combination climate impacts arenot likely to be identified that are thought to increase the significance of any residual effects.
- **Carbon**: Increased frequency of extreme weather events could result in damage and increased material maintenance, repair and replacement. Increased temperatures and droughts could result in increased summer cooling demand in buildings.
- **Ecology**: Drier conditions, increased wind speed, flooding and variation in temperature and rainfall can result in habitat loss and fragmentation and may affect the ability of certain species to adapt.
- **Human health**: Temperature increases may affect thermal comfort. Hotter, drier conditions may cause reduced health and wellbeing for communities. Extreme weather events may impact quality and patterns of use of open spaces and create stress for people.
- **Landscape and visual**: Drier conditions, hotter and wetter conditions could lead to loss of vegetation and defoliation which could disrupt views to and from the site. It may affect the type of vegetation which will change the landscape character. Increased windspeed could also cause tree loss.
- **Noise and vibration**: Increased temperature and changes in humidity in summer could result in a greater number of people sleeping with windows open. These climate changes can also

alter propagation characteristics of sound through air and may lead to increased building services demand to cool buildings which may produce more noise.

- **Socio-economics**: Temperature increases will affect thermal comfort within buildings; Extreme weather events may delay or prevent access to infrastructure and may changepublic behaviour and the pattern of use of public spaces.
- **Soils and groundwater**: Drier conditions could lead to increased soil erosion and impact soil quality. Increased rainfall, wind speed and flooding could reduce soil quality and increase erosion.
- **Transport**: Hotter conditions could result in variation to public transport and active travel methods and time spent outdoors. Increased temperatures and/or increased rainfall or cold weather could result in road, footpath and cycle path closures.
- **Water resources, flood risk and drainage**: Drought/wetter conditions could affect groundwater flows. Increased intensity of rainfall events could lead to increased flood risk, run-off, and discharge volume, and increased surface water run-off. High summer temperatures with lower rainfall levels could result in lower flows in watercourses, a reduction in groundwater levels, low river flows and reduced groundwater recharge and levels. The proposed development is located within 200m of the flood plain from the River Cam so has the potential to be affected by flooding.
- **Wind:** This assessment may be affected by a potential change in wind speeds brought about by climate change. However, significant uncertainty exists regarding future projections of wind speed and direction, and therefore potential in-combination climate impacts are not likely to be identified that are thought to increase the significance of any residual effects.

CRR Assessment

7.36 This assessment will consider the resilience of the proposed development to the physical impacts of future climate change. The IEMA guidance defines climate change resilience as the 'ability to respond to changes in climate. If a receptor or project has good climate change resilience, it is able to respond to the changes in climate in a way that ensures it retains much of its original function and form. A receptor or project that has poor climate change resilience will lose much of its original function or form as the climate changes.' The CCR assessment differs from other EIA topics in that it considers how resilient the development itself is to future climate change (i.e. the impact of climate change on the development, rather than the impact of the development on the environment).

7.37 Given the nature of the proposed development, the following impacts will need to be considered in the Climate Change Resilience assessment, as there is a potential for likely significant effects due to:

- **High temperatures, heatwaves and drought**: Increase in local air quality pollutants and environmental damage. Reduction in building performance, potential breaching of temperature standards and regulated environments, health impacts and reduced productivity. Increased HVAC system power demand. Particular consideration will be given to the risk of overheating;
- **Low temperatures, ice and snow**: Freeze-thaw action. Fracture of surfaces. Risk to underground infrastructure. Increased maintenance requirements;
- **High precipitation, river, surface water and groundwater flooding**: Local flooding and inadequate drainage. Increased risk of pollution incidents and release of contaminated surface water. Road damage caused by flooding. The proposed development is located within 200m of the flood plain from the River Cam so has the potential to be affected by flooding.;

- **Low precipitation, drought and soil moisture deficit:** Reduced water availability leading to mandatory water reductions and limitations, increased dust. Potential earthworks failure following subsequent rainfall events;
- **Humidity**: this can cause mould, condensation and decreased thermal performance of buildings;
- **Storms/lightning strikes**: Damage of the buildings including the roofs, guttering andwindows; and
- **Wind**: Damage to vegetation, movement of dust, and stress and damage to above groundutility infrastructure.

7.38 The vulnerability of the proposed development to sea-level rise is proposed to be scoped out of the assessment on the basis that the inland location of Cambridge means that it is not at risk of coastal flooding. The site is approximately 67km west of the nearest coastline and ground levels are 6m above sea level; the proposed development is therefore not at risk of flooding from the sea.

Carbon Assessment

7.39 The assessment will describe the potential impacts on carbon emissions generated by the construction and operation of the proposed development, and their relative contribution to the proposed development's overall carbon emissions.

7.40 The potential construction and operational impacts scoped into the assessment are presented in Table 7.2.

Table 7.2: Potential impacts scoped into the assessment

CONSTRUCTION IMPACTS	
Sub-topic	**Rationale**
Manufacture and production of construction materials	Carbon emissions arising from the manufacture and production of construction materials typically result in the largest contribution to construction carbon emissions. Therefore, this is scoped into the assessment.
Construction materialtransport	Carbon emissions will arise from transport of construction materials to and from the siteand is therefore scoped into the assessment.
Construction site works	Carbon emissions will arise from energy and fuel use associated with demolition, construction plant use and construction worker accommodation on site. Due to uncertainties on the scale, volume and type of plant and accommodation, this isscoped into the assessment.
Land use change	Carbon emissions may occur associated with land use change and the disturbance of previously sequestered carbon during construction. Therefore, this is scoped into the assessment.
OPERATIONAL IMPACTS	
Sub-topic	**Rationale**
Carbon emissions from energy and fuel use	Energy and fuel use during operation, including room lighting, cooling and heating haspotential to be significant and is therefore scoped into the assessment.
Operational traffic emissions	Operational traffic carbon emissions will arise from journeys to and from the proposeddevelopment. Where data is available, the assessment of operational traffic carbon emissions is scoped into the assessment.
Carbon sequestration	Habitat creation on site would result in carbon sequestration and is therefore scoped into the assessment.

7.41 Given the nature of the proposed development, the potential construction and operational impacts scoped out of the assessment are presented in Table 7.3.

Table 7.3: Potential impacts scoped out of the assessment

CONSTRUCTION IMPACTS	
Sub-topic	**Rationale**
Treatment and disposal of waste materials	Carbon emissions from construction and demolition waste will be minimised throughstandard practice mechanisms such as a Site Waste Management Plan. The majority of unavoidable construction and demolition waste will be inert and be reused, avoiding transport to landfill. Local waste treatment facilities will be utilised,therefore minimising transport distances. Detail will be provided as part of the planning application to demonstrate how waste will be minimized and managed in a sustainable way during construction. Therefore, this is scoped out of the assessment.
Traffic emissions	Construction worker transport to and from the site is expected to result in a minor impacton carbon emissions as it is assumed most will use the public transport network. Therefore, this is scoped out of the assessment in line with British Standard ES 15978:2011 on assessing the carbon lifecycle impact of buildings.
Water use during construction	Water consumption during construction is expected to result in a minor impact on carbon emissions. For similar sized projects, the impact of water consumption is likely tobe less than 5% of the total carbon footprint. Carbon emissions associated with water use has therefore been scoped out.
OPERATIONAL IMPACTS	
Sub-topic	**Rationale**
Treatment and disposal of waste materials	The proposed development will seek to reduce operational waste through implementation of the Waste Hierarchy approach[22]. Detail will be provided as part of the planning application to demonstrate how waste will be minimized and managed in a sustainable way during operation. Therefore, the assessment of waste treatment and disposal is scoped out.
Carbon emissions associated with wateruse	Water consumption is likely to have a minor carbon impact from water treatment and supply (pumping). For similar sized projects, the impact of water consumption is likely tobe less than 5% of the total carbon footprint. Carbon emissions associated with water use has therefore been scoped out.

Approach and Method

ICCI Assessment

7.42 Based on the potential in-combination climate change impacts identified and the potential effects identified in this Scoping Report, there is considered the potential for significant effects to arise and as such this assessment is scoped in.

7.43 The ICCI assessment will consider how the impacts of the proposed development on the receiving environment will be affected by future climate change, either directly or indirectly. The ICCI assessment can be considered to be an assessment of impacts against a future baseline that includes climate change. The ICCI assessment is most relevant to environmental receptors that are sensitive to weather and climate. The criteria for identifying significant effects in the ICCI assessment will be the same as the criteria applied under each topic for impacts under current climate conditions.

7.44 The ICCI assessment will be carried out using the current and future climate conditions.

7.45 The assessments will be carried out by the climate change topic specialist with support from the topic specialists.

7.46 The receptors relevant to the location, nature and scale of the project and which have been identified as part of the EIA and reported within the ES from other environmental topics, will be considered in the ICCI assessment.

7.47 The assessment will involve considering whether there will be an impact on the susceptibility/vulnerability/value and/or importance of the identified sensitive receptors as a result of climate change projections. The topic specialists, with support from the climate change specialist, will determine whether the sensitivity of receptors will be greater or lesser under future climate conditions. It will then be determined whether the probability and/or consequence of an effect at these receptors will change as a result of climate change.

7.48 An assessment of any change to likely significant environmental effects as a result of climate change will be produced, following standard methodologies for each relevant environmental topic.

7.49 Mitigation measures will be developed with the topic teams to address adverse effects on the ability of the receiving environment to adapt to climate change, beyond those already suggested, and allowances will be included for future measures and monitoring, to ensure the continued resilience of the receiving environment.

7.50 The results of the ICCI assessments will be reported in the climate change chapter of the ES.

CCR Assessment

7.51 The CCR assessment will be carried out using the current and future climate conditions and will comprise an assessment of the risk of climate change impacts to the new assets created by the propose development. The CRR assessment will involve:

- Identifying potential climate change risks to the proposed development;
- Assessing these risks; and
- Formulating mitigation actions to reduce the impact of the identified risks.

7.52 The assessment of risk will be based on a combination of likelihood and magnitude. Likelihood and magnitude will be defined using the criteria outlined in Table 7.4.

Table 7.4: Likelihood and magnitude definitions

LIKELIHOOD CATEGORY	DESCRIPTION
High	The event occurs several times during the lifetime of the project (60 years), e.g. approximately once every five years, typically, 12 events.
Medium	The event occurs limited times during the lifetime of the project (60 years), e.g. approximately once every 15 years, typically 4 events.
Low	The event occurs during the lifetime of the project (60 years), e.g. once in 60 years.
MAGNITUDE OF IMPACT	**DESCRIPTION**
Large adverse	Disruption to the proposed development lasting more than 1 week
Moderate adverse	Disruption to the proposed development lasting more than 1 day but less than 1 week.
Minor adverse	Disruption to the proposed development lasting less than 1 day.
Negligible	Disruption to an isolated section of the proposed development lasting less than 1 day.

7.53 The assessment of the magnitude of impacts will take into account factors including:

- The acceptability of any disruption in use if the project fails;
- Its capital value if it had to be replaced;
- Its impact on neighbours;
- The vulnerability of the project element or receptor; and
- If there are dependencies within any interconnected network of nationally important assets on the new development.

7.54 Significance will be defined using the matrix shown in Table 7.5. Any risks identified as being significant will require mitigation.

Table 7.5: Significance matrix

		LIKELIHOOD		
		Low	**Medium**	**High**
MAGNITUDE	**Negligible**	Not significant	Not significant	Not significant
	Minor	Not significant	Not significant	Significant
	Moderate	Not significant	Significant	Significant
	Large	Significant	Significant	Significant

7.55 The information supporting the risk assessment is likely to be qualitative and based on expert judgement of the relevant specialists. However, in some cases quantitative information may be available, e.g. regarding flood risk.

7.56 Where aspects of the design prevent a qualitative CCRA assessment being carried out, a set of design commitments and embedded mitigation will be developed with the relevant specialists that will ensure that no high risks remain in terms of climate change resilience.

Carbon Assessment

7.57 The assessment will follow a lifecycle approach as set out in PAS 2080 Guidance Document on Carbon Management. Where any lifecycle stage is excluded, justification will be included within the ES.

7.58 The assessment will be undertaken in line with IEMA's guidance on 'Assessing Greenhouse Gas Emissions and Evaluating their Significance' and any anticipated updates to this guidance. This guidance describes a good practice approach to achieving a proportionate assessment of a development's potential impact on carbon emissions.

7.59 The assessment will quantify the net carbon emissions from the construction and operation of the proposed development. The carbon assessment will be supported by a combination of carbon modelling tools, lifecycle software and publicly available information on construction materials. Data used will be the best available data at the time of the assessment; for example, carbon emissions factors will be representative of the UK construction industry.

7.60 The significance criteria for the carbon assessment will take account of the proposed development's carbon emissions in the context of building standards and policy, including the UK's target of net zero by 2050. This will consider the proposed development's net carbon emissions, but also whether the proposed development contributes to reducing carbon emissions consistent with a trajectory towards net zero by 2050.

7.61 It is good practice to contextualise carbon emissions. The net emissions associated with the Proposed Development will be contextualised against existing local, regional and national carbon budgets to understand the proposed development's relative contribution to climate change. Where possible, this will also be compared to industry specific carbon budgets.

7.62 Any proposed mitigation measures to reduce as far as reasonably practicable the proposed development's carbon emissions will be presented in the ES. These may include, but will not be limited to, sourcing of local construction materials and use of electric plant vehicles on site.

Assumptions

7.63 Publicly available data for all construction materials, such as the University of Bath's Inventory of Carbon and Energy, will be used for all relevant carbon factors. For all other components of the carbon footprint, Department for Business, Energy & Industrial Strategy (BEIS) greenhouse gas reporting conversion factors[32] or similar publicly available information sources will be used.

7.64 Unless otherwise stated, carbon emissions will be reported in terms of tonnes of carbon dioxide equivalents (tCO_2e).

7.65 Any assumptions will be based on the latest available data and professional judgement, following consultation with relevant disciplines and will be set out in the climate change chapter of the ES.

7.66 While modelled climate change projections represent anticipated changes to average weather conditions, they cannot predict the frequency and severity of acute events such as droughts, heatwaves and prolonged heavy rainfall). Therefore, the ICCI and CCR assessment is based upon UKCP18 predictions for general changes in climate conditions, and only a high-level assessment of acute events is included in this assessment.

7.67 The ICCI and CCR assessment is limited to the availability of data and information at this stage of the assessment. The full assessment results will be detailed in the ES.

Consultation

7.68 Consultation for the carbon assessment will be undertaken with the project team and wider EIA topic specialists, where appropriate, to collect topic specific data, as well as identify any parallel activities or assumptions. If required, Cambridge City Council will be consulted to establish whether or not any local/regional carbon budgets exist.

7.69 No other consultation specific to the climate change assessment is planned to be undertaken.

References

[1] UK Government (2017) Town and Country Planning Environmental Impact Assessment Regulations 2018 No. 571

[1] Directive 2011/92/EU Of the European Parliament and of the council (2011) http://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=CELEX:32011L0092

[32] Department for Business, Energy and Industrial Strategy (2021). Greenhouse gas reporting: conversion factors 2020. Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021

[1] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0052

[1] European Commission, 2013, An EU strategy for adaptation to climate change

[1] European Commission, 2013, Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment. http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf (accessed December 2019).

[1] Climate Change Act 2008, (c. 27). London, Her Majesty's Stationery Office.

[1] https://www.gov.uk/government/collections/climate-change-adaptation-reporting-second-round-reports

(accessed December 2019).

[1] DCLG, 2014, Guidance: Climate Change. Available at:http://planningguidance.communities.gov.uk/blog/guidance/climate-change/how-can-adaptation-and- mitigationapproaches-be-integrated/ (accessed December 2019).

[1] Environment Agency, (Updated February 2016) Flood risk assessments: climate change allowances. Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances (accessedDecember 2019).

[1] Planning Practice Guidance, Climate Change Paragraph 4, 6-004-20140612 Available online at: http://planningguidance.communities.gov.uk/blog/guidance/climate-change/how-can-adaptation-and- mitigation-approaches-be-integrated / (accessed December 2019).

[1] Cambridge City Council (2016-2021). Climate Change Strategy https://www.cambridge.gov.uk/media/3230/climate_change_strategy_2016-21.pdf

[1] Paris Agreement to the United Nations Framework Convention on Climate Change (2015)

[1] UK Government, The Climate Change Act 2008 (2050 Target Amendment) Order 2019. Queen's Printer of Acts of Parliament, 2019

[1] Ministry of Housing Communities and Local Government, "National Planning Policy Framework," 2019

[1] Department for Environment Food & Rural Affairs, "The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting Making the country resilient to a changing climate," 2018

[1] UK Government, "The Clean Growth Strategy Leading the way to a low carbon future," 2017

[1] UK Government (2020) United Kingdom of Great Britain and Northern Ireland's Nationally Determined Contribution.
Available from*: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/943618/uk-2030-ndc.pdf [Accessed 19 October 2021]*

[1] Institute of Environmental Management and Assessment (2010) Principles on Climate Change Mitigation and EIA

[1] North East Cambridge Area Action Plan (2020) Available at: https://www.greatercambridgeplanning.org/emerging-plans-and-guidance/north-east-cambridge-area-action-plan/

[1] Greater Cambridge Sustainable Design and Construction Supplementary Planning Document (2020) Available at: https://www.scambs.gov.uk/planning/local-plan-and-neighbourhood-planning/greater-cambridge-sustainable-design-and-construction-supplementary-planning-document-spd/

[1] Cambridgeshire County Council CUPSE: Net Zero Cambridge (2019) Available at: https://data.cambridgeshireinsight.org.uk/dataset/cambridgeshire-policy-challenges-cambridge-university-science-and-policy-exchange-cuspe-8

[1] IEMA (2017), Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions andEvaluating their Significance. Available at: https://www.iema.net/assets/newbuild/documents/IEMA%20GHG%20in%20EIA%20Guidance%20Docu ment%20V4.pdf

[1] PAS 2080:2016. (May 2016). Carbon management in infrastructure. [online]. Available at: www.bsigroup.com

[1] BS EN 15978:2011 Sustainability of construction works. Assessment of environmental performance ofbuildings. Calculation method. Available at: www.bsigroup.com

[1] BS 15804:2012 Sustainability of construction works. Environmental product declarations. Core rulesfor the product category of construction products. Available at: www.bsigroup.com

[1] Whole life carbon assessment for the built environment, RICS (November 2017). Available at: https://www.rics.org/globalassets/rics-website/media/news/whole-life-carbon-assessment-for-the--built- environment-november-2017.pdf

[1] Carbon Management Plan 2016-2021, Cambridge City Council. Available at: https://www.cambridge.gov.uk/carbon-management-plan

[1] South Cambridgeshire Local Plan, 2018. Available at: https://www.scambs.gov.uk/planning/local-plan-and-neighbourhood-planning/the-adopted-development-plan/south-cambridgeshire-local-plan-2018/

[1] Met Office, https://www.metoffice.gov.uk/public/weather/climate/gcpffxw47 (accessed 22/11/2021)

[1] UK Met Office. Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index

[1] Department for Business, Energy and Industrial Strategy (2021). Greenhouse gas reporting: conversion factors 2020. Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021

8.0 Cultural Heritage

Introduction

8.1 The Cultural Heritage Assessment will be undertaken by Turley. This chapter provides an overview of the proposed baseline and methodology and should be read alongside the cultural heritage baseline presented in Appendix 2.

8.2 The October 2020 Scoping Opinion from the Greater Cambridge Shared Planning Service advised that cultural heritage needed to be scoped into the EIA for the Cambridge North development. The Scoping Opinion also confirmed that the potential impact of the proposal on archaeology could be scoped out. The scope of the cultural heritage assessment is therefore confined to the potential effects on the setting of designated heritage assets in the surrounding area.

Baseline Conditions

8.3 The Cultural Heritage assessment includes all built heritage assets, scheduled monuments and man-made landscapes within a predominantly c2km study area but extending to 5km in places to incorporate important assets with the potential to be affected because of the topography and historic importance. The baseline conditions set out in Appendix 2 are a result of desk-based study and site observations. In the context of this development and the study area, cultural heritage is considered to include the following types of designated, man-made, heritage assets:

- Listed Buildings
- Conservation Areas
- Scheduled Monuments
- Registered Parks and Gardens

8.4 There are also local heritage assets (non-designated heritage assets) within the study area, e.g. Buildings of Local Interest and significant buildings in conservation areas. However, the scope of the cultural heritage baseline assessment has been limited to designated heritage assets following the recommendations of the 2020 Scoping Opinion.

8.5 The cultural heritage baseline aims to understand and identify the built heritage significance of the study area including the specific elements, features and aesthetic factors that define the setting of the identified heritage assets. Ultimately, such understanding provides the evidence to aid the definition of the cultural heritage value of the study area. The baseline is concerned with the visibility of the development, identification of the cultural heritage assets and of viewpoints that illustrate the impact on these and are combined with the LVIA (see LVIA chapter 12 for details of LVIA methodology). The LVIA considers the historic landscape context in greater detail, but this is also considered in the context of heritage asset settings as relevant in the Cultural Heritage Assessment. Details of the baseline conditions are provided in Appendix 2.

Potential Impacts

8.6 Based on the available development parameters and baseline research conducted so far, it is expected that the proposals would have some cultural heritage impact. The significance of the resulting effects would be subject to the final layout, massing and height details.

8.7 The proposal is likely to result in some significant effects, as per the EIA definition particularly concerning cultural heritage assets in close proximity to the Site, notably in the Fen Ditton area, and those to the east and north of the Site. Heritage assets to the west and south of the Site, generally appear to be more screened by intervening vegetation and built form. However, there are some potential exceptions, notably the Scheduled Monument of Castle Mound and the Riverside and Stourbridge Conservation Area.

8.8 Based on the baseline cultural heritage and LVIA baseline work undertaken so far, it is proposed that the following heritage assets are scoped into the EIA as there are considered to be potential significant effects on these heritage assets which should be assessed through the Cultural Heritage ES Chapter:

- St Mary's Church, Fen Ditton, Grade II* Listed Building
- Fen Ditton Hall and Barn to NW, Grade II* Listed Buildings
- Fen Ditton Conservation Area
- Riverside and Stourbridge Conservation Area
- Baits Bite Lock Conservation Area
- Cambridge Castle Mound, Scheduled Monument
- Biggin Abbey, Grade II* Listed Building
- Poplar Farmhouse, Grade II Listed Building

8.9 The impact on the significance of all of the heritage assets set out in the cultural heritage baseline assessment (see Appendix 2) will be considered through the Heritage Statement which will form a Technical Appendix to the ES Chapter. This will provide the non-technical narrative that will support the quantitative approach that is prescribed by the EIA process. The ideas of benefit, harm and loss (as per the NPPF) will set out 'what matters and why' in terms of the heritage assets' significance and also consider the cumulative impact of the development on the cultural heritage of the area in addition to the cumulative effects assessment that will be undertaken as part of the EIA.

Approach and method

8.10 The Cultural Heritage Assessment will be prepared in accordance with the "Historic Environment Good Practice Advice in Planning Note 3 (Second Edition): The Setting of Heritage Assets" (GPA3) published by Historic England (December 2017). It will also reference the guidance contained within 'Historic England Advice Note 4: Tall Buildings' (HEAN4), December 2015).

8.11 As recognized in the Scoping Opinion, there are clear cross-overs with other technical disciplines that will be considered in the EIA that need to be considered in the assessment of the impact on cultural heritage. These will include traffic, light, noise and most evidently, landscape and visual

impacts. The Cultural Heritage ES Chapter will clearly cross-reference to the relevant technical chapters where necessary.

8.12 A detailed methodology of how the appraisal of cultural heritage effects will be carried out can be found in Appendix 2.

Consultation

8.13 The LPA's Scoping Opinion (dated 8 Oct 2020) 'scoped in' Cultural Heritage and recommended that Historic England was contacted directly and that the Council's Conservation Team would be part of pre-application discussions. Following receipt of the Scoping Opinion, consultation with the Council's Conservation Officer and Historic England has been undertaken at pre-application meetings in the early part of 2021. These meetings set out the proposed viewpoints which were to be assessed for the LVIA based on potential landscape, visual and cultural heritage impacts, and include heritage specific viewpoints in accordance with the Scoping Opinion recommendation.

8.14 The viewpoints have been modelled in Vu.City with some subsequently discarded, some moved and some added to ensure the correct locations were modelled to enable the assessment of impact on the cultural heritage. Pre-application discussions continue with the LPA and Historic England.

References

8.15 The proposed methodology for undertaking the Cultural Heritage assessment follows available best practice andguidance, namely:

- 'Historic Environment Good Practice Advice in Planning 3: The Setting of Heritage Assets', (GPA3) produced by Historic England (Second Edn 2017);
- 'Historic England Advice Note 4: Tall Buildings', (HEAN4). (10 December 2015);
- 'Statements of Heritage Significance: Analysing Significance in Heritage Assets' (HEAN12), Historic England Advice Note 12 (21 October 2019);
- Policies 60 and 61 and Appendix F, Cambridge Local Plan (2018); and,
- Policy NH/14, South Cambridgeshire Local Plan (2018).

8.16 The desk-based study related to the baseline information has made reference to the following documents:

- Historic Maps including Tithe and Ordnance Survey;
- National Planning Policy Framework (2021);
- South Cambridgeshire Local Plan (2018);
- South Cambridgeshire Local Plan Adopted Policies Map (2018);
- Cambridge Local Plan (October 2018);
- Cambridge Local Plan Adopted Policies Map (October 2018);
- North East Cambridge Landscape Character and Visual Impact Appraisal (LCVIA): Development Scenarios

- Fen Ditton Conservation Area Appraisal (2005);
- Horningsea Conservation Area Appraisal (2005);
- Baits Bite Lock Conservation Area Appraisal (2005)
- Riverside and Stourbridge Common Conservation Area Appraisal (March 2012);
- Castle and Victoria Road Conservation Area Appraisal (March 2012);
- Natural England, National Landscape Character Profiles;
- Cambridge Landscape Character Assessment (April 2003);
- The Cambridgeshire Landscape Guidelines (1991);
- National Heritage List for England (https://historicengland.org.uk/listing/the-list);
- The Planning Practice Guidance (https://www.gov.uk/government/collections/planning-practice-guidance); and,
- Historic aerial photography: Britain from Above (https://britainfromabove.org.uk)

9.0 Ecology

Introduction

9.1 The ecology assessment will be undertaken by Mike Barker, RPS Director of Ecology (CEnv FCIEEM).

Baseline Conditions

9.2 A number of Phase 1 Habitat surveys have been undertaken on the application site since April 2012. This includes update surveys undertaken in September 2013, April 2015, April 2017, October 2019 and July 2021.Detailed botanical surveys were undertaken in August 2017, June 2018 and October 2019.

9.3 The Phase 1 Habitat survey and botanical surveys identified that thesite consisted of a good proportion of the bare ground remaining from the original railway sidings substrate and dense willow/birch scrub. The disturbed bare ground is able to regenerate quickly back to the early succession plant community that formed a habitat defined as 'open mosaic habitat' (OMH). These open areas support annual, biennial and short-lived perennial species andqualify as 'open mosaic habitat on previously developed land' which is a UKBAP habitat and habitat of principal importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

9.4 An invasive species survey of the site was undertaken in July 2018 following best practice as described by the Environment Agency (2006, amended 2013), Royal Institute of Chartered Surveyors (RICS, 2012) and the Property Care Association (PCA, 2013). No Schedule 9 species were found within the boundary of the site. A number of Non-Native Invasive Species of particular concern listed under Schedule 9 Part 2 of the Wildlife and Countryside Act 1981 (as amended) was recorded, including Cotoneaster *Cotoneaster sp.,* Tree of Heaven *Ailanthus altissima,* and Buddleia *Buddleia sp.*

9.5 These areas of open mosaic habitat and areas of dense scrub and trees provided suitable habitat for a number of protected and notable species, including reptiles, breeding birds, foraging and commuting bats and invertebrates. A number of protected species surveys have been undertaken on site for these species since 2013. The area comprising the proposed temporary car park north of Cowley Road was not included within all of these protected species surveys. However, it has been surveyed for these species groups in some of the surveys and is considered to be of similar ecological character to the remainder of the site, which is supported by the detailed botanical survey results.

9.6 Common lizards *Zootoca vivipara* and Grass Snakes *Natrix natrix* have previously been translocated from the site between 2013 and 2015. A reptile survey following guidelines outlined by the *Herpetofauna's Worker's Manual* (Gent and Gibson, 2003) and Froglife Advice Sheet 10 (Froglife, 1999) was undertaken within suitable areas of habitat on site in September 2018. A juvenile Grass Snake and an adult Common Lizard was recorded during the surveys. A localised translocation completed in October 2018 did not observe or capture any reptiles on site. It is therefore considered that the reptiles found on site in 2018 are a remnant population that were

missed in the previous translocation, or reptiles that have moved on to the site when the fencing was removed or damaged.

9.7 Breeding bird surveys were undertaken across the whole site in May and June 2018 based on standard territory mapping methodology as outlined in Gilbert at al. (1998) and Bibby et al (2000). A total of 29 species were recorded during the survey, of which 13 were confirmed breeding. There have also been breeding bird surveys undertaken in 2012, 2015 and in 2019, covering the scrub habitats within the temporary car park footprint. Three UK Bap species and species of principle importance have been recorded each time (Dunnock, Song Thrush and Starling). None of the species found breeding are considered rare. The historical baseline for breeding birds on the site is considered to be of district importance.

9.8 Bat activity surveys were undertaken on the site in June, July and August 2018 following Bat Conservation Trust Best Practice Survey Guidelines (Collins, 2016). The transect route included all the habitat types encountered within the site boundary to ensure an accurate representation of the bat species present on site. The survey area included habitats within the temporary car park footprint. Automated bat detectors were also placed at various locations within the survey area to gain additional information on bat species utilising the site.

9.9 Three bat species; Common Pipistrelle *Pipistrellus pipistrellus,* Soprano Pipistrelle *Pipistrellus pygmaeus* and Noctule *Nyctalus noctule* were recorded during the activity surveys. Unknown pipistrelle and unknown bat species contacts were also recorded (where the call is too brief and/or faint to make any positive identification), which may have been additional bat species.

9.10 The areas of highest activity were along the western edge of the site, above the scrub and trees, although bats were also recorded on the eastern edge of the site. The low numbers of bats recorded suggest the site is not used by significant numbers of commuting and foraging bats.

9.11 Seven species were recorded during the automated surveys; Common Pipistrelle, Soprano Pipistrelle, Nathusius' Pipistrelle *Pipistrellus nathusii*, Noctule, Serotine *Eptesicus serotinus,* Brown Long-eared *Plecotus auratus* and an unknown *Myotis.*

9.12 Invertebrate surveys were undertaken twice per month between May and September 2013 across the whole of the CB4 site, which includes part of this application site. An initial survey was undertaken in 2020 and a further detailed survey was undertaken in Summer 2021. The overall results ofthe survey indicated that the CB4 site as a whole contained a level of invertebrate interest that was considered to be of County value at that time. Construction disturbance to parts of the CB4 site may have actually increased the invertebrate interest by regenerating the early successional OMH.

Potential Impacts

9.13 Given the nature of the proposed development the following impacts will need to be considered as there is a potential for likely significant effects due to:

- Loss of Open Mosaic Habitat;
- Spread and management of invasive species;

- Loss of reptile habitat on site and a small residual risk of reptiles being killed or injured during construction;
- Loss of bird nesting habitat and risk of nesting birds being disturbed during construction;
- Loss of bat commuting and foraging habitat; and
- Loss of notable (previously county value) invertebrate habitat.

9.14 The following topics have been scoped out, as there are not likely to be significant effects:

- Amphibians – the site was of limited value due to lack of waterbodies present andpredominately industrial land use;
- Badgers – no historic signs of badger activity have been recorded on site. Limited habitat for setts and foraging present;
- Dormice – no suitable dormouse habitat present on site; and
- Water Vole and Otter – no suitable habitat present on site.

Approach and Method

Ecological Appraisal

9.15 The scope of works will include a desk study consultation to collect all existing ecological data relating to the site and within a 2km search radius from the centre of the site. Ecological data will be requested from Cambridgeshire and Peterborough Environmental Records Centre (CPERC). The results of the desk study will include records of protected species and other species of conservation interest that will inform the assessment.

9.16 The survey baseline as updated in 2020 and 2021 should be sufficient to define the ecological value of the site.

ES Chapter (EcIA)

9.17 The assessment of ecological impacts for the ES chapter will be in accordance with the ecological impact assessment guidelines published by Chartered Institute of Ecology and Environmental Management (CIEEM).

9.18 The ecology ES Chapter will provide a summary of the relevant planning policy and legislative context. Effects on ecology and nature conservation may arise as a result of:

- Direct loss of existing habitats or species on site;
- Disturbance or damage to habitats or species on or adjacent to the site; and
- Habitat fragmentation or species isolation.

9.19 The ES Chapter will comprise the evaluation of nature conservation value and identification of any key ecology receptors which will be affected by the proposal. The impact of construction activities and the completed development on these features will be assessed. The assessment will also include cumulative and in-combination impacts as a result of other developments in thelocal area.

9.20 Any mitigation proposals will be designed in consultation with the project team and client and referred to in the ES. Predicted residual impacts after the implementation of mitigation/compensation will be defined.

9.21 The information presented in the ecology chapter may have cross-over with several other disciplines. Liaison with other ES topic specialists will form part of the approach undertaken to ensure consistency in approach and avoid potential conflicts of interests.

Consultation

9.22 The site has been subject to a number of rounds of discussion with the ecological and planning staff at South Cambridgeshire District Council and this has informed the ecological approach forthe site. The design of the masterplan will be informed by the Ecology Design Strategy. Where possible the open mosaic habitat will be retained and enhanced, particularly along the western edge. Elsewhere mitigation incorporating green and brown roof design, and native planting and wildlife habitats to continue and support the rich invertebrate and flora present, will be provided.

9.23 The scheme will aim to deliver Biodiversity Net Gain (at +10%), whilst acknowledging that muchof the existing habitats will be lost and some scrub will be cleared to restore early successional OMH. For net gain, the strategy is to deliver within the redline both at rooftop and at ground level.

References

Bibby, C.J., Burgess, N.D., Hill, D.A. & Mustoe, S.H. (2000). *Bird Census Techniques, second edition*. Academic Press, London

CIEEM (2017). *Guidelines for Preliminary Ecological Assessment*. Chartered Institute of Ecology and Environmental Management, Winchester.

Collins J. (ed.) (2016). *Bat surveys for Professional Ecologists: Good practice guidelines* (3rd Edition). Bat Conservation Trust, London.

Froglife (1999). Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

Gilbert, G., Gibbons, D.W. and Evans, J. (1998). *Bird Monitoring Methods: A manual of techniques for key species.* RSPB/BTO/JNCC/WWT/ITE/The Seabird Group. RSPB/BTO, Sandy, Beds.

JNCC (2010). *Handbook for Phase 1 Habitat survey: a technique for environmental audit* (revised reprint). Joint Nature Conservation Committee, Peterborough.

10.0 Flood Risk and Drainage

Baseline Conditions

Fluvial Flood Risk

10.1 The principal watercourse in the area is the River Cam (designated as a Main River by the EA) which flows north-east, approximately 500m to the east of the Site (at its closest point).

10.2 The EA publishes floodplain maps available on their website (https://flood-map-for-planning.service.gov.uk). These maps show the undefended extents of the possible fluvial flooding for a 1 in 100-year flood event (that which would have a 1% probability of being exceeded each year) and the possible extent of flooding arising from a 1 in 1,000-year event (0.1% probability of annual exceedance).

10.3 The EA flood maps show that the full extent of the Site is located within Flood Zone 1 (lowprobability of fluvial flooding).

Surface Water

10.4 The Site formerly formed part of the Chesterton Sidings and comprises brownfield landcomprising former railway sidings, associated depots and hardstanding areas.

10.5 The UK Government publishes long-term flood risk data on its website (https://flood-warning-information.service.gov.uk/long-term-flood-risk/map). These maps show that the undevelopedSite contains areas classified as being at 'Low Risk' from surface water flooding

10.6 The existing and consented development associated with Cambridge North Station, the Novotel, One Cambridge Square, and associated infrastructure such as the Cambridgeshire guided busway, hard landscaping and highways, drains via gravity to a pumping station located west of Cambridge North Station and Cambridgeshire Guided Busway.

10.7 The surface water pumping station serving the site conveys flows through a rising main to an attenuation structure within the build-up of the Cambridge North Station Carpark. Flows from this attenuation structure are controlled using a flow control device to discharge at a rate of 2.0l/s/ha into the diverted First Public Drain culverted overflow section, located below the Station Car Park to the north-east of the Site.

Surface Water Quality

10.8 The Environment Agency website holds the river basin management plans for England and Wales. The 'River Basin Management Plan Anglian River Basin District' report (published by the Environment Agency (EA) in February 2016) has been reviewed to gain an understanding of the existing water quality in the waterbodies that will receive runoff from the development site.

10.9 Following a review of these documents, it has been identified that the River Cam has a 'Moderate Ecological Status' and the water body status objective is to maintain the current 'Moderate Ecological Status'. These criteria have not changed in the draft updated 'River Basin Management Plan for Anglian River Basin District' issued for consultation on 22 October 2021.

Groundwater and water resources

10.10 Geological mapping (MAGiC online resource) indicates that the superficial River Terrace Deposits at the Site are designated as a Secondary A aquifer, whereas the Gault Formation Mudstone bedrock is designated as unproductive strata. To the south and east of Cambridge the Chalk bedrock is designated as a Principal Aquifer. The Site is not located within a groundwater Source Protection Zone (SPZ).

10.11 The site lies within the area supplied by Cambridge Water. It is assumed that water will be supplied via connection to existing supplies and under existing abstraction licence permissions. Cambridge Water prepare water resources management plans, which set out how water resources will be sustainably managed over a 25-year period, accounting for the effects of climate change, population growth, and environmental protection requirements.

10.12 Water Resources East (WRE) was established as an independent not for profit company in June 2019. Both Cambridge Water (CW) and Anglian Water (AW) are key founding members of WRE.WRE are working to safeguard a sustainable supply of water for the East of England.

10.13 The Integrated Water Management Study prepared in November 2020 on behalf of Greater Cambridge Shared Planning notes that there is no capacity to increase groundwater abstraction from the chalk aquifer. Alternative measures may need to be implemented in order to secure sustainable future water supplies for the region. Measures could involve a combination of site-scale solutions and strategic measures, and may include greater water efficiency, leakage management, identifying new supplies from sustainable water sources, licence trading, import of water from outside the region, and new water supply reservoirs.

Potential Impacts

10.14 During construction, potential impacts may include:

- An increase in the rate of surface water run-off relative to 'pre-development' levels;
- The potential for the contamination of surface water and groundwater resulting from the flushing of inappropriately stored or accidentally spilled petrochemicals and silts following soil stripping and earthwork operations;
- Mobilisation of existing contaminants present in the made ground on Site through earthworks operations, potentially leading to migration of contaminated groundwater through creation of preferential pathways, which could impact upon controlled waters. For example, piles and utilities, particularly if they intersect with the Secondary A aquifers.
- A potential increase in silt loading associated with the excavation and movement of earthworks materials across the site during the formation of the development plots andconstruction works;
- These effects can be mitigated effectively through implementation of a robust Construction Environmental Management Plan (CEMP), resulting in no significant impacts. It is therefore

considered that the effects above can be scoped out of the EIA on the assumption that a CEMP is submitted.

10.15 During operation, potential impacts may include:

- An increase in the impermeable area within the River Cam catchment, thereby increasing the rate and volume of surface water run-off to the watercourse and increasing downstream flood risk. The surface water drainage strategy will be designed to limit discharge to 2.0 l/s/ha of the overall developed area.
- Impacts on the quality of surface water as a result of contaminated surface water entering watercourses.
- In the absence of mitigation, the development could have the potential to increase water demand; affect surface and ground water quality; increase flood risk off site; and result in surface water discharge from the site that could pose impacts downstream.
- The Flood Risk Assessment and Drainage chapter of the ES will assess how these potential impacts can be appropriately managed.

Approach and Method

Flood Risk Assessment (FRA)

10.16 The FRA will consider the site in its existing condition and will review this in the context of the proposed development in accordance with the National Planning Policy Framework (NPPF) and National Planning Policy Guidance (NPPG).

10.17 The FRA will be carried out following consultation with key stakeholders, including the EA, Cambridge City Council (as maintainers of the First Public Drain), Anglian Water, Cambridge Water, the Lead LocalFlood Authority Cambridgeshire County Council, and South Cambridgeshire District Council (SCDC). This will be carried out to:

- Identify and collate data in respect of the flood risk arising from watercourses in the area;
- Agree the issues to be addressed by the FRA;
- Agree the scope of any investigation/technical work required to inform the FRA if required; and,
- Agree design principles that should be applied to ensure compliance with policy/legislationand guidance.

Surface Water Drainage Strategy (SWDS)

10.18 A SWDS will be produced for the Proposed Development in accordance with National Planning Practice Guidance, relevant local planning policies, EA guidance on climate change, and Sewerage Sector Guidance Appendix C Design and Construction Guidance (for any surface water drainage systems serving the Proposed Development to be brought forward for adoption by Anglian Water).

10.19 All Sustainable Drainage Systems (SuDS) features will be designed in compliance with the SuDS Manual and best practice guidance.

10.20 The SWDS will be designed to replicate, as close as possible, the existing drainage regime using SuDS, and provide betterment over and above the existing hydrological conditions, where feasible and practicable. In order to manage the runoff rate from the Proposed Development, thesurface water drainage network will be designed to limit discharge to a rate of 2.0l/s/ha of the overall development area.

10.21 The SWDS will ensure that overland flows in excess of the capacity of the positive drainage systems are routed away from buildings towards the less vulnerable highways, open space and surface water attenuation provision.

10.22 The SWDS will take into account the effects of climatechange over the lifetime of the development. An outline water maintenance schedule will beincluded.

10.23 Surface water runoff quality will be managed by applying appropriate pollution control measures and establishing operational, inspection and maintenance processes to minimise the risk of pollution events occurring.

10.24 The site will aim to provide a sound strategy for managing the quality of surface water runoff arising from the increase in impermeable area. Since a significant proportion of the site will be impermeable roofs, the risk of water pollution is very low.

10.25 Based on the previous ground investigation work, it is considered unfeasible that infiltration drainage can be used due to the high groundwater levels recorded (between 1 to 2 metres below ground level in some locations). Further ground investigations will be carried out to confirm the extent of contaminated land and to monitor the ground water levels on the site. Groundwater flood risk will be mitigated against where appropriate.

10.26 The surface water run-off is proposed to discharge into the diverted First Public Drain culverted overflow section which passes through the Site and discharges downstream towards an outfall to the River Cam.The following measures will be incorporated within the surface water drainage system to ensure that water quality, biodiversity, and ecology are maintained to the highest standards:

- Trapped highway gullies will be incorporated into the surface water drainage system to help mitigate against diffuse pollution arising from the Site;
- Petrol interceptors will be provided where appropriate;
- Attenuation basins and swales, including vegetative systems if feasible will be proposed to mitigate against diffuse pollution; and
- As development proposals are confirmed in detail, other source- and plot-specific measures could be set up as required, based on the potential for surface water pollution, potentially including further swales, permeable paving, green/brown/blue roofs or rainwater harvesting.

Consultation

10.27 Consultation will be carried out with key stakeholders including the Environment Agency (EA), Cambridge City Council (as maintainers of the First Public Drain), Anglian Water, Cambridge Water, the Lead LocalFlood Authority Cambridgeshire County Council, and South Cambridgeshire District Council.

11.0 Human Health

Introduction

11.1 The Health Chapter will consider the impact of the Proposed Development's construction and operation on the need for health infrastructure and health impacts on the local population. It provides a preliminary assessment of the health impacts methodology, identified potential populations affected and the likely health impacts and effects.

11.2 It will be prepared by Bidwells, by health and social research specialists within the planning team, led by Juliet Clark BA MSc MRTPI AIEMA.

Legislation

11.3 The Proposed Development is of a scale that it requires a Health Impact Assessment to comply with Policy SC2 of the South Cambridgeshire District Plan. The development does not meet the criteria for HIA as set by Cambridge City Council in its Local Plan. Having consulted with SCDC health officer[33], it has been agreed that this will take the form of a combined Health and Environmental impact assessment (HEIA) in the Environmental Statement.

11.4 South Cambridgeshire District Council (SCDC) HIA Supplementary Planning Guidance (SPD) does not provide specific guidance on methodology for combining health and EIA. The relevant EIA Regulations (The Town and Country Planning (Environmental Impact Assessment) Regulations 2017) require an assessment of the health impacts of a development, but there is no agreed methodology for this assessment. Therefore, a new methodology combining both approaches is necessary to meet the requirements of the EIA Regulations and conform with SCDC HIA policy.

Baseline Conditions

11.5 The ES will describe the baseline conditions associated with the Application Site based on desk study and consultation with key stakeholders. This will involve a desk-based review of:

- Health indicators
- Population profiles of the local population, Cambridge, and South Cambridgeshire; and
- Access to the wider determinants of health
  - Open space and nature
  - Opportunities for active travel
  - Work and training
  - Opportunity to grow social capital

[33] Telephone conversation between Lesley MacFarlane and Juliet Clark on 29th January 2020

- Opportunity for community involvement
- Crime rates and community safety

11.6 The baseline for social infrastructure, climate change, contaminated land, air quality, noise and sustainability will be covered in their respective EIA chapters, but considered collectively in the Health chapter.

11.7 The health baseline conditions are informed by:

- Census 2011
- NHS data
- Cambridgeshire, Cambridge and South Cambridgeshire District JNSAs
- Other topic based JSNAs
- Cambridgeshire Insight
- Data from Public Health England (PHE), GP and the local Clinical Care Group (CCG)
- Indices of Deprivation
- Technical work by other consultants on other ES chapters (socioeconomic, pollution, ground conditions, transport, sustainability)
- Area Action Plan
- Evidence base of the Consultation Draft Greater Cambridge Local Plan.

Future Baseline Conditions

11.8 As required by Schedule 4 of the 2017 EIA Regulations the Health chapter will contain an outline of the likely evolution of the baseline conditions without implementation of the development. This needs to be "*as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge*".

Design and Mitigation Measures

11.9 The preliminary design of the Proposed Development incorporates a range of measures that assist with reducing negative health impacts and adding health benefits. These measures include:

- Public open space
- Employment
- Infrastructure to facilitate active modes of travel.
- Retail facilities and other amenities.
- High quality design of all buildings to BREEAM excellence standard

11.10 The full health assessment will provide details of further mitigation that is incorporated into the Proposed Development as the design progresses.

Potential Health Impacts and Approach

11.11 The World Health Organisation (WHO) defines health as *"a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity."*[34] Implicit in the definition is the notion that there are both positive and negative elements of health.

11.12 It is widely accepted that there are direct impacts on health, such as illness, but that health and wellbeing is also influenced by a package of determinants relating to the wider environments in which we work. The Health Chapter will look these determinants.

11.13 At Scoping Stage, a checklist by NHS London Healthy Urban Development Unit, known as the HUDU checklist, (and advocated by SCDC in its HIA SPD) has been used to undertake a rapid assessment of a wide range of potential impacts. The impacts requiring more detailed assessment are taken forward for further analysis in the ES chapter. The assessment is included in **Appendix 3**.

11.14 Different health impacts will arise during the construction period and during operation (i.e. once the development is occupied). The following impacts have been scoped out as they do not relate to an employment-based scheme:

11.15 **Access to health and social care services**. GP registration typically reflects where a person lives rather than where they work. Likewise need for and provision of social care. Other primary care services such as dentist, opticians and pharmacies are driven by the market decisions of providers and as such cannot be influenced by the development. A range of such services are however accessible to employees on the site in Cambridge, Chesterton and Milton, a short bus ride or cycle away. Employment sites can generate additional demand on emergency and hospital services. However, as an allocated site within an area action plan, the needs of the development will have already been factored into the future needs assessments of the hospital service providers.

11.16 **Access to social infrastructure**. This topic will be assessed in the Socioeconomic chapter, with findings summarised in the health chapter. The development provides flexible space that could be used for a range of eating and drinking establishments. Such facilities as well as public open space, which will complement the opportunities for 'corridor-and-coffee-machine-conversations', contribute to encouraging development of social capital, which is included in the health assessment.

11.17 **Access to lifetime Neighbourhoods**. This is not applicable to an employment-based scheme.

11.18 **Access to high quality, affordable housing:** No housing is being proposed in the development.

11.19 Table 11.1 list the potential impacts are scoped into the ES. In addition, other chapters will consider health impacts of air quality noise and neighbourhood amenity, climate change and minimising use

[34] www.who.int

of resources. These impacts will be considered in the Health chapter when assessing cumulative effects.

Table 11.1 Topics Scoping into the EIA

IMPACTS AND EFFECTS SCOPED INTO THE HEIA	GEOGRPAHY
Impact on construction workers during the construction process principally in relation to access to active travel, access to work and training, air quality, noise, soil contamination and general construction health and safety	Site
Impact on local receptors during the occupation phase:	
– Access to open space and nature.	Site, Study Area (1.5km / 15-minute walk)
– Accessibility and active travel.	Site
– Access to work and training.	Site, Greater Cambridge
– Access to work in high quality healthy buildings and environment	Site
– Access to healthy food	Site (1.5km / 15-minute walk)
– Opportunity to grow social capital.	Site, Study Area (1.5km 15-minute walk)
Crime reduction and community safety	Site

Methodology

11.20 This is a combined Health and Environmental Impact Assessment to be submitted to SCDC, as requested in the EIA Scoping Opinion (November 2019).

11.21 At Scoping Stage, a checklist developed by NHS London Healthy Urban Development Unit, known as the HUDU checklist, (and advocated by SCDC in its HIA SPD) has been used to undertake a rapid assessment of a wide range of potential impacts. The impacts requiring more detailed assessment are taken forward for further analysis in the ES chapter.

11.22 This methodology has been developed in consultation with SCDC Health Officer Lesley Macfarlane[35].

[35] Telephone conversation with Juliet Clark on 29th January 2020

Geographical Boundaries

11.23 The geography of health impacts varies according to the type of health impact. For example, noise nuisance may be localised, whereas opportunities for reducing social isolation could extend to an entire neighbourhood and relate to access routes.

11.24 All impacts will be assessed at site level. Some assessments use local Study Areas, based on Local Super Output Areas (LSOAs) within approximately 1.5km (actual walking distance from the site) and 5km (reasonable actual cycle distance from the site).

- The 1.5km area broadly relates to Chesterton, comprising: LSOA E01017971, E01017972, E01017974, E01032802 (all in Cambridge City).
- For the purposes of air quality and noise the Study Area is based on that used in the relevant topic chapter, with particular reference to the Study Area.

11.25 Wider geographies have also been referred to as appropriate for the determinant under consideration.

Significance of Impact

11.26 One of the challenges for the assessment of human health in EIA is the absence of guidance or widely adopted terminology for assessing the significance of impacts (Cave et al, 2017). Industry standard approaches entail revising environmental impact assessment methodology to define significance on a project-by project-basis.

11.27 The significance of a health effect is identified by determining a baseline position for the areas of health scoped into the HIA assessment and then determining changes in this baseline. These changes are attributed significance in EIA terms through the following processes.

11.28 Health effects are socio-biological effects and are complex. It is difficult to accurately predict the precise nature or scale of impacts for some health topics. Quantitative analysis will be possible for some impacts; for example, the demand for GP places created because of the proposals. For other impacts, such as wellbeing, which is subjective, a proxy quantitative measurement will be used (e.g. obesity rates) and/or a qualitative assessment will be undertaken. Expert professional judgement used to identify the significance of the effects.

11.29 The significance of resulting health effects, whether adverse or beneficial, depends on:

- the characteristics (or magnitude) of the effect (e.g. intensity, duration, frequency, reversibility);
- geographic and administrative context; and
- baseline sensitivity of receptors reflecting geographic scale and the sensitivity of the resource.

11.30 The evaluation of potential effects will also take into account the strength of evidence for the health outcome, and the number of people affected (both existing and future population). The vulnerability of the human population experiencing the impact will be considered and where a specific population group is predicted to be affected by a health impact, this will be identified. Uncertainties and limitations will be addressed.

Definitions of Significance

11.31 The significance of effects will be determined as per the terminology and key considerations provided in Table 11.2 below. Major and moderate effects will be considered significant in the context of the EIA Regulations.

Table 11.2 Definitions of Significance

SIGNIFICANCE OF EFFECT	DEFINITION	INTENSITY	DURATION
Major Adverse	Substantive pathways to increases in acute or chronic physical and mental diseases or death; on evidenced health or wellbeing issues.	The exposures tend to be of high intensity. Impacts over a large geographical area (e.g. regional/national) or affect a large number of people (e.g. over 500 people) or impact substantial numbers of individuals within vulnerable social groups.	Long term duration, permanent or intermittent of notable intensity.
Major Beneficial	Substantive pathways to preventing deaths or enhancing wellbeing; addressing evidenced health or wellbeing issues		
Moderate Adverse	Creating poor physical or mental health or wellbeing. May be nuisance / quality of life impacts which may affect physical and mental health either directly or through the wider determinants of health.	The exposures tend to be of moderate intensity and/or over a relatively localised area and/or likely to affect a moderate to large number of people e.g. between 100-500 individuals or impact notable numbers of individuals within vulnerable social groups.	Medium term duration; or intermittent and temporary of notable intensity, or permanent.
Moderate Beneficial	Enhancing mental wellbeing and/or reduce exacerbations to existing illness and reduce the occurrence of acute or chronic diseases.		
Minor Adverse	Likely to have impacts (adverse or beneficial) but unlikely to be material to evidenced health or wellbeing issues.	The exposures tend to be of low intensity and/or over a small area and/or affect a small number of people e.g. less than 100. Few individuals within vulnerable social groups impacted.	Short term duration or permanent.
Minor Beneficial			
Neutral	None or barely perceptible changes	n/a	n/a

Vulnerable groups

11.32 Our initial assessment of likely vulnerable groups affected by the development include:

- Construction workers.

- Employees on site, particularly those lacking local connections, are new to the area or UK.
- Residents adjacent to the site, particularly in the caravan park, the elderly and those with existing mental health conditions.
- Residents adjacent to haul routes and site entry points.
- Pedestrians and cyclist accessing the train station.
- Disabled.
- Travellers.

Consultation

11.33 This Scoping Report has been informed by consultation with:

- Lesly Macfarlane, SCDC Health Officer- (29/1/2020);
- Ryan Coetsee: SCDC Community Development Officer (5/2/20, 15/7/20);
- Greg Willis Make Architects 15 July 2020
- Vimal Fatania Formation Architects 15 July 2020
- Andrew Russell Hilson Moran 20/7/20
- Kevin Coulson and Joanne Quirin Hoare Lea 22/7/20
- Jennifer Berry Robert Myers Associates 23/7/20
- Andrew Rawlings Mott MacDonald 23/7/20
- David Long Brookgate 23/7/20
- Fiona Batha Hilson Moran 16/11/21
- Bidwells planning team

11.34 Contact was sought with Cambridgeshire and Peterborough Clinical Care Group and Red House Surgery in July 2020, but no response was forthcoming. Contact will be sought to complete the EIA.

Cumulative Impacts

11.35 The methodology for assessing cumulative effects will be set out in the ES in detail. This will draw on standard EIA methodologies. Where other projects are in the public domain, available information will be collected and an assessment of likely significant effects will be undertaken.

References

11.36 Documents reviewed for scoping include:

- Cambridge District Joint Strategic Needs Assessments (JSNA);
- South Cambridgeshire JSNA;
- Cambridgeshire JSNA;

- South Cambridge District Council (2011) Health Impacts Assessment Supplementary Planning Guidance;
- SCDC (May 2020) Scoping Opinion for Darwin Green Phase 2 and 3.
- South Cambridge District Council (2018) Local Plan,
- https://fingertips.phe.org.uk/profile/general-practice
- Emerging Greater Cambridge Local Plan and evidence base

Abbreviations

SCDC South Cambridgeshire District Council

HIA – Health Impact Assessment

HEIA - Health and Environmental Impact Assessment HIA SPD

MVHR: Mechanical Ventilation Heat Recovery (of residential ventilation unit)

CIBHR: Chartered Institute Building Service Engineers

DAS – Design and Access Statement

PRS- Private rental sector housing

12.0 Landscape and Visual

Introduction

12.1 The Landscape and Visual Impact Assessment (LVIA) will be carried out by Bidwells. This chapter provides an overview of the proposed baseline and methodology and should be read inconjunction with the detailed LVIA baseline and methodology presented in **Appendix 4**.

Baseline Conditions

12.2 The LVIA includes landscape and visual baselines. In both cases, the work produced is a resultof desk-based study and site observations.

12.3 The landscape baseline aims to understand and identify the character of the study area, including the specific elements, features and aesthetic factors that contribute to its landscape value. The visual baseline is concerned with the visibility of the development and the identification of the visual receptors and representative viewpoints. Details of baseline conditions are provided in **Appendix 4**.

Potential Impacts

12.4 Based on the available development parameters and baseline research conducted so far, it is expected that the proposals would have some landscape and visual impact. The significance ofthe resulting effects would be subject to the final layout, massing and height details.

12.5 The proposal is anticipated to result in some significant effects, as per the EIA definition (see detailed methodology in **Appendix 4**), particularly concerning visual receptors in close proximity to the Site. Some medium-range views are also likely to experience significant impact.

Approach and Method

12.6 The LVIA will be prepared in accordance with the "Guidelines for Landscape and Visual Impact Assessment: Third Edition", (GLVIA3) published by the Landscape Institute and the Institute of Environmental Management and Assessment. However, given the urban nature of the Site context, the GLVIA3 approach will be applied with reference to townscape (rather than landscape) impact where appropriate.The term townscape is used to encompass the partially urban characteristics of the Site and its context.

12.7 A detailed methodology of how the appraisal of landscape and visual effects will be carried outcan be found in **Appendix 4**.

Consultation

12.8 Formal consultation with the Local Authority, together with workshops on landscape/townscape matters, have been carried out, and will continue to progress the discussion on the relevant impacts.

12.9 Liaison with the Landscape Officer has resulted in a list of agreed viewpoints that will be considered in the LVIA, as presented in **Appendix 4**. Further consultation will be carried out to determine the technical approach to the preparation of visualizations.

References

12.10 The proposed methodology for undertaking the LVIA follows available best practice andguidance, namely:

- 'Guidelines for Landscape and Visual Impact Assessment', (GLVIA3) produced by the Landscape Institute with the Institute of Environmental Management and Assessment (Third Edition, 2013);
- 'Visual Representation of Development Proposals'. Technical Guidance Note 06/19, by the Landscape Institute (17 September 2019);
- 'Townscape Character Assessment', Technical Information Note 05/2017, by the Landscape Institute (5 December 2017); and
- Policy 60 and Appendix F, Cambridge Local Plan (2018).

12.11 The desk-based study related to the baseline information includes the following documents:

- Ordnance Survey 1:10,000 scale Application Site-centred digital raster map;
- National Planning Policy Framework (February 2019);
- South Cambridgeshire Local Plan (2018);
- Cambridge Local Plan (October 2018);
- Cambridge Local Plan Policies Map (October 2018);
- North East Cambridge Landscape Character and Visual Impact Appraisal (LCVIA): Development Scenarios
- Fen Ditton Conservation Area Appraisal (2005)
- Riverside and Stourbridge Common Conservation Area Appraisal (March 2012);
- De Freville Conservation Area Appraisal (March 2009)
- Chesterton and Ferry Lane Conservation Area Appraisal (June 2009);
- Natural England, National Landscape Character Profiles;
- Cambridge Landscape Character Assessment (April 2003);
- Greater Cambridge Landscape Character Assessment (February 2021);
- Cambridge Inner Green Belt Boundary Study (November, 2015);

- Multi-Agency Geographic Information for the Countryside (MAGIC): Web-based interactiveGIS mapping site (www.magic.gov.uk); and
- Aerial photography: Google Maps (http://maps.google.co.uk).

13.0 Lighting

Introduction

13.1 The lighting chapter of the ES will identify any likely significant effects of the proposed development on the existing and consented developments regarding sunlight and daylight availability, solar glare to rail, and obtrusive lighting.

13.2 The proposed development comprises detailed designs as well as outline ones and, consequently, the mean of assessing the effects for the lighting effects will be relevant to the level of detail available, for each aspect. For some aspects, it will be proposed for these to be considered at a later stage, when sufficient design detail is available.

13.3 The following table summarises what is included in the assessment of the likely significance for the lighting effects for the proposed development.

Table 13.1 Likely Significance for Lighting Effects

Lighting Effects	Outline Design Elements	Detailed Design Elements
Sunlight and daylight availability	Included, based on the proposed massing and parameters plan	
Reflected solar glare to train drivers	Not included, because an assessment requires knowledge of the façade properties as well as the detailed massing of the building.	Included
Obtrusive lighting	Not included, as the assessment requires a detailed design for the lighting installation.	Included

Baseline Conditions

13.4 The baseline condition is defined as the site in the current existing configurations, including the surrounding properties.

13.5 These configurations will be derived from survey data. Key uncertainties will be highlighted, and a level of detail adopted for the 3d computer model sufficient to determine potential impacts.

13.6 For obtrusive lighting assessment the baseline condition will be acquired by night time illuminance and luminance measurements around the site. **At this stage it is assumed that the environmental zone for the natural wild areas surrounding the site is EZ2**.

Study Area

Daylight and Sunlight

13.7 BR209 recommends that the study area for sunlight and daylight effects to be 3x the height ofthe tallest building on site. A preliminary indication of the study area is shown in **Figure 13.1**.

13.8 The assessment will include all surrounding residential properties, small workshops, some offices (cellular offices only) and amenity open areas which are included in the study area.

Reflected solar glare to train drivers

13.9 The study area for assessing the reflected solar glare to the train drivers will include a section of rail adjacent to the detailed portion the proposed development as shown in **Figure 13.2**. This is approximately 500m of rail from the red line in either direction. This will show the location and the time of the year in which the proposed building envelopes can reflect sunlight in the line of sight of train drivers approaching or departing from the site.

Obtrusive Lighting

13.10 Lighting will be required for operational activities and security purposes at all stages of the proposed development. The enabling and construction works will occur during the daytime but will require illumination particularly during the autumn and winter.

13.11 Obtrusive light, sometimes referred to as light pollution, may cause nuisance to others or adversely affect fauna and flora. It is subject to policy and statutory requirements.

13.12 The National Planning Policy Framework acts as a guidance for the local planning authorities and the National Planning Practice Guidance supporting the framework encourages best practice design so as to limit the impact of light obtrusion on local amenity, intrinsically dark landscapes and nature conservation. Paragraph 180 states that:

13.13 ‘planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: [...] c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation’.

13.14 The Environmental Protection Act 1990 (Part III Statutory Nuisance and Clean Air, section 79 of Statutory nuisance and inspections thereof), gives local authorities the power to consider obtrusive artificial light as a Statutory Nuisance. The Act states that:

13.15 ‘any artificial light emitted from premises so as to be prejudicial to health or a nuisance, constitutes “statutory nuisance” for the purpose of this Part, and it shall be the duty of every local authority to cause its area to be inspected from time to time to detect any statutory nuisances which ought to be dealt with under section 80 and, where a complaint of a statutory nuisance is made to it by a

person living within its area, to take such steps as are reasonably practicable to investigate the complaint'.

13.16 The Clean Neighbourhoods and Environmental Act 2005 (section 102 of the Clean Neighbourhoods and Environmental Act 2005), gives local authorities the power to consider obtrusive artificial light as a Statutory Nuisance. The Act makes:

> 'exterior light emitted from premises so as to be prejudicial to health or a nuisance' a criminal offence'.

13.17 At the current stage, the assessment of obtrusive lighting will be focused on the wild habitat to the north of the site, adjacent to the proposed temporary car park.

13.18 **Figure 13.3** shows the study area for obtrusive lighting assessment. No other receptors have been identified.

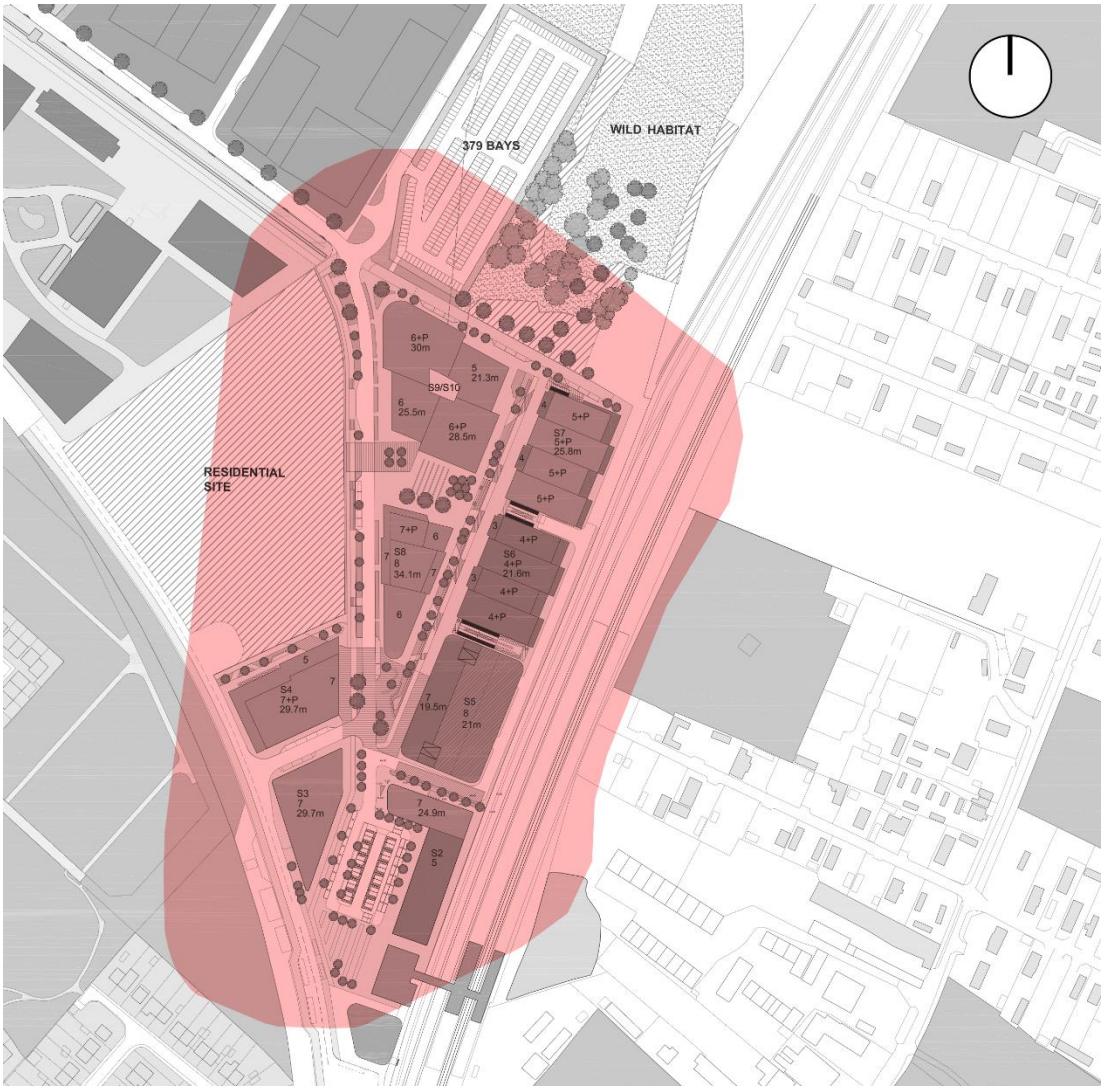

Figure 13.1: Extent of the study area for sunlight and daylight availability (in red).

Figure 13.2: Extent of the study area for reflected solar glare (in red)

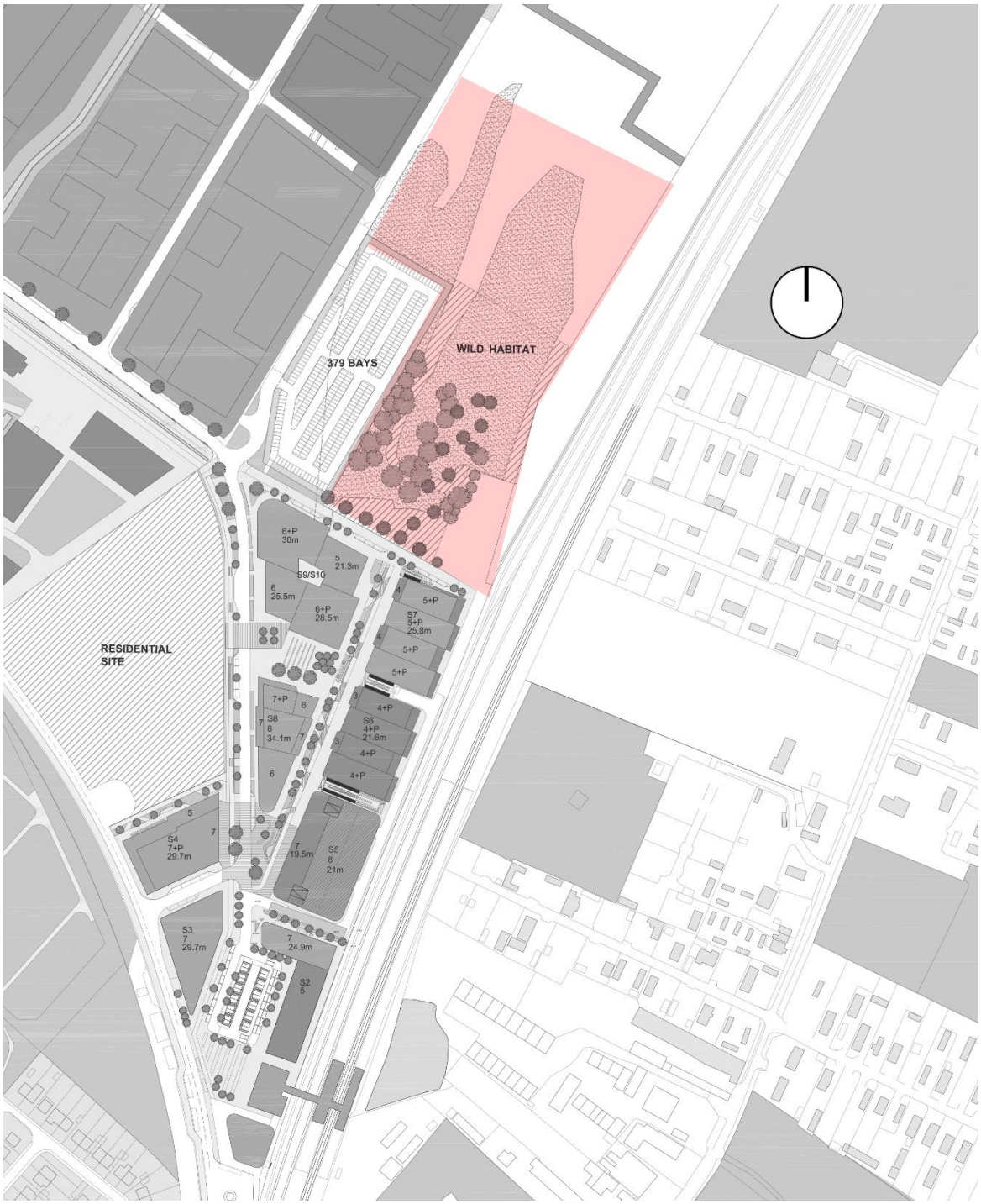

Figure 13.3: Sensitive receptors considered for obtrusive lighting (in red)

Potential Impacts

13.19 Given the nature of the proposed development, the following impacts will be considered:

- Daylight on dwellings - vertical skylight component
- Sunlight on dwellings - probable annual and winter sunlight hours
- Sunlight penetration to adjacent open areas
- Reflected solar glare to train drivers

- Obtrusive lighting to surrounding sensitive receptors

13.20 The following topics have been scoped out as there are not likely to be significant effects:

- Effects in relation to daylight, sunlight, overshadowing and reflected glare will vary throughout the construction phase. The effects of the completed development represent a worst-case scenario; thus, it isnot necessary to test for this effect relative to the construction phase.
- Effects of construction phase for obtrusive lighting is not possible as there is not yet a construction plan, and positions, typologies of light fixtures used for lighting construction operations. This will be subject to conditions and is excluded by the scope of this document.
- Generally, workshops and commercial properties have internal shading devices to control glare and therefore access to sunlight/daylight will be curtained. Therefore, these spaces will not be included in the assessment.
- The daylight and sunlight and obtrusive lighting to future users is not considered in the assessment as there is not baselined to compare to. The design will be carried out following industry guidance.

Approach and Method

Daylight and Sunlight

13.21 The assessment of daylight and sunlight availability will be based on BR 209 and will be carried out by means of simulations using ray-tracing software.

13.22 The assessment will use the comparison between the performance of the baseline condition and proposed condition.

13.23 The proposed condition will be represented by the proposed design set within the surrounding existing properties. This configuration will include all the proposed massing blocks for the Site.

13.24 BR 209 recommends using the following metrics to measure daylight and sunlightavailability:

- Vertical skylight component (VSC)
- No skyline (given the extent of the study area and the practicality of finding all internallayouts, no-skyline will be omitted from the assessment)
- Probable sunlight annual and winter hours (annual =PASH and winter =PWSH)
- Sunlight on the ground (as per BR 209 guidance considering amenity areas and the percentage of these in sunlight on 21st of March)

13.25 The targets set in BR 209 will be used for the assessment, with the applicability of mirror massing and removal of balcony for alternative target setting where and if appropriate.

13.26 **It is noted that in the study areas there are currently no residential receptors and therefore it is proposed that only sunlight availability to amenity areas to be assessed.**

13.27 In determining the effects of the proposed development on sunlight availability in the surrounding areas, the following grading will be used.

Table 13.2: Proposed grading of determination of daylight and sunlight effects on sunlight availability to open areas

DESIGNATION	RATIO between proposed and baseline condition areas receiving at least 2 or more hours of sunlight on 21st of March	SIGNIFICANCE
Major adverse	< 0.6	Significant
Moderate adverse	> 0.6	Significant
Minor adverse	> 0.7	Not Significant
Negligible	within BR 209 guidance	Not Significant
Minor beneficial	>1.2	Not Significant
Moderate beneficial	> 1.5	Significant
Major beneficial	> 2	Significant

Reflected solar glare to train drivers

13.28 The BRE Guidelines include the following in regards to reflected solar glare:

13.29 “Glare or solar dazzle can occur when sunlight is reflected from a glazed façade. This can affect road users outside and the occupants of adjoining buildings. The problem can occur either when there are large areas of reflective glass or cladding on the façade, or when there are areas of glass or cladding which slope back so that high altitude sunlight can be reflected along the ground. Thus, solar dazzle is only a long-term problem only for some heavily glazed (or mirror clad) buildings…”

13.30 The effects of the proposed development for reflected solar glare will consider the positions of trains along the tracks adjacent the proposed development. A series of viewpoints will be plotted, at 2.75m above the track and every 25m along the tracks, to check for reflection of sunlight from the reflective portion of the building envelopes.

13.31 Each of this viewpoint will determine a diagram showing the occurrence of reflections at that given location throughout the year.

13.32 Alongside this information, a view from the train will be plotted, showing the colour coded sun path and its position relative to the view centre.

13.33 Professional judgment will be used to establish the extent of the impact, based on the duration of the reflection, the duration of the instance along the track for which a reflection is visible and the position of the reflection to the line of sight.

Table 13.3: Proposed grading of determination of reflective solar glare effects

DESIGNATION	CRITERION	SIGNIFICANCE
Major adverse	Reflection within 5° from view direction	Significant
Moderate adverse	Reflections within 10° from view direction	Significant
Minor adverse	Reflections within 30° from view direction but at the same time in which sunlight is visible from the same viewpoint and not within 10° from view direction	Not significant
Negligible	No reflections within 30° from view direction at any time of the year	Not significant

Obtrusive Lighting

13.34 **Relative to the obtrusive lighting, the impact of concern will be the effect on fauna along the wild habitat at the north of the site**. Bats are affected by both light level and the spectrum of increased incident light. This can modify behaviour away from current foraging routes and increase predation. Assessment is required to establish effective mitigation of light spill onto natural areas. Units: illuminance (E), measured in lux. The car park will be assessed against these criteria.

13.35 **Obtrusive light** is spilled light which particularly affects residential properties either through the intrusion of light into bedrooms causing a nuisance or impedes the view of the night sky from the property. Light intrusion is unlikely to have a significant impact since it can be addressed locally using blinds or curtains already in place. Assessment is required to establish that limiting values for light intrusion detailed in the ILP Guidance Note GN01 are not exceeded. Units: illuminance (E), measured in lux. In the case of the proposed development, no residential receptors are to be found adjacent to the site, or close enough, to have the potential of being affected by it. This requirement will be used at the perimeter of the wild habitat at the North of the site.

13.36 **Façade Luminance**: how bright an illuminated façade appears to the observer. The ILP Guidance Note GN01 details limiting values of façade luminance for different environmental zones. Assessment is required to establish that the limiting values are not exceeded. Units: Luminance (L) measured in cd/m2. At this stage the design is not progressed enough for simulations. Therefore, the assessment will include a list of the design measures included not to exceed this parameter.

13.37 **Source Intensity**: how bright the light source appears to an observer. The brightness of luminaires can impact the view towards the development site and affect the ability of road users to see essential information. The installation should be assessed to ensure that visible luminaires comply with the limiting values of CIE 150 2017. Units, Intensity (I), measured in candelas (cd). The car park will be assessed against these criteria.

13.38 **Skyglow**: a combination of Direct Upward Light and Indirect Upward Light. This effect is seen as a glow in the night sky and reduces the view of the stars. The skyglow is quantified in the ILP Guidance Note GN01 by the percentage of the luminous output emitted above the horizontal plane. Assessment is required to ensure that the installation does not contribute more than the limiting percentage of sky glow. The car park will be assessed against these criteria.

13.39 The assessment methodology for this assessment will follow recognised industry standards and will incorporate the guidance from:

- Institute of Lighting professionals (ILP) Guidance Note GN01 (2021): Guidance Notes for the Reduction of Obtrusive Light.
- ILP Guidance Note GN08 (2018): Bats and artificial lighting in the UK; Bats and the Built Environment series.
- ILP Professional Lighting Guide PLG 04 (2013): Guidance on Undertaking Environmental Lighting Impact Assessments.
- BS EN 12464, Part 2 (2014): Outdoor Lighting.
- BS 5489, Part 1 (2020): Code of Practice for the design of road lighting.
- SLL LG6 (2016): The Exterior Environment

13.40 In determining the effects of the proposed development due to obtrusive lighting to the surrounding areas, the following grading will be used.

Table 8.3: Proposed grading of determination of obtrusive lighting effects

Parameter	Environmental ZONE within which the simulated effects sit	SIGNIFICANCE
Obtrusive lighting Façade Luminance Source Intensity Sky Glow	Any environmental zone above EZ2	Adverse and Significant
	Within EZ2	Negligible and not Significant
	Any environmental zone below EZ2	Beneficial and Significant

Consultation

13.41 Consultation will be undertaken with the LPA as necessary during the scoping process.

References

- Building Research Establishment's (BRE) Site Layout Planning for Daylight and Sunlight; A Guide to Good Practice (2011).
- Institute of Lighting professionals (ILP) Guidance Note GN01 (2021): Guidance Notes for the Reduction of Obtrusive Light.
- ILP Guidance Note GN08 (2018): Bats and artificial lighting in the UK; Bats and the Built Environment series.
- ILP Professional Lighting Guide PLG 04 (2013): Guidance on Undertaking Environmental Lighting Impact Assessments.
- BS EN 12464, Part 2 (2014): Outdoor Lighting.
- BS 5489, Part 1 (2020): Code of Practice for the design of road lighting.
- SLL LG6 (2016): The Exterior Environment.

14.0 Noise and Vibration

Introduction

14.1 The noise chapter within the ES will identify and assess the potential noise impact and effects activities associated with the construction and operation of the proposed development. The assessment will be conducted in accordance with the Greater Cambridge - Sustainable Designand Construction Supplementary Planning Document Adopted January 2020, which makes reference to other guidance and legislation as outlined below.

Baseline Conditions

14.2 The noise environment on the site comprises of traffic noise from the A14, Milton Road, Cambridgeshire Guided Busway, train noise from the railway (Fen Line, which runs from Cambridge to King's Lynn) and Cambridge North Railway Station Operations (Station PA system, car park, Network Rail maintenance yard, industrial estate operational noise (including but not limited to a tarmac processing plant, Veolia Waste Recycling Centre and Freightliner mineral plant) and traffic noise from Cowley Road. During previous surveys, contributions from the Cambridge North construction site, dogs barking, birds, people talking and DIY in the neighbourhood also contributed to measured noise levels.

14.3 Noise criteria for assessment of noise are dependent on existing noise levels. To set noise criteria relative to the background noise level it is necessary to know the background noise levels in the area of the sensitive receptors. It is usual to conduct a baseline noise survey in order to quantify existing noise levels at a sample of the potentially affected receptors. Noise surveys have been previously conducted in the area for earlier proposals. The information from these surveys will be reviewed in the light of the current proposal. If required, further survey work will beconducted to augment this.

14.4 Where it is considered that the previous surveys need to be updated or augmented, unattended monitoring positions will be chosen to be representative of the ambient noise level at a potentially affected sensitive receptor or group of sensitive receptors for a period of not less than 24 hours, subject to suitable secure locations being available for the measurement equipment. If suitable secure locations are not available, attended measurements will be undertaken at key times.

14.5 Noise levels will be measured in decibels for a range of stated descriptors as appropriate (e.g. LAeq, LA1, LA10, LA90, and LAFmax). The measurements will be conducted using calibrated equipment in accordance with relevant guidance and standards on environmental noise level measurements.

14.6 All measurements will be undertaken by consultants competent in environmental noise monitoring and completed in accordance with the principles of BS 7445-1: 2003 ‘Description and measurement of environmental noise. Guide to quantities and procedures’ (BSI, 2003). All acoustic measurement equipment to be used during the noise survey is designed to be in conformance with the BS EN 61672-1: 2013 ‘Electroacoustics. Sound level meters (BSI, 2013). Specifications’ to the requirements of the Class 1 standard.

Potential Impacts

14.7 For the purpose of the assessment, the noise and vibration sources will be divided into the construction and operational phases, and will be assessed using industry common practice, procedures and assessment criteria. Potential noise impacts associated with each phase are as follows:

Construction Phase

- Noise from Construction activities;
- Vibration from Construction activities; and
- Noise from Construction Traffic.

Operational Phase

- Operational Noise from the development such as building services plant;
- Additional Traffic noise generation on the road network due to the development; and
- The risk of adverse effects on the site itself from existing noise sources.

Approach and Method

Construction Phase

Noise from Construction activities

14.8 Construction noise will be assessed using BS 5228-1:2009+A1:2014 C*ode of practice for noise and vibration control on construction and open sites* – Part 1: *Noise* (BSI, 2009, amended 2014). BS 5228-1 provides a methodology for predicting noise levels generated by plant and equipment associated with construction operations. BS 5228-1 does not define strict criteria to determine the significance of noise impacts. However, it has two methods for assessing construction noise. In order to determine the potential for significant change, Method 1, called the A, B, C method from Annex E, would be applied for this assessment.

Vibration from Construction activities

14.9 Construction vibration may be considered in relation to potential building damage and human annoyance. The potential for building damage will be considered in relation to guidance given in BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from ground-borne vibration, and BS 5228-1:2009+A1:2014 Code of practice for noise andvibration control on construction and open sites – Part 2: Vibration. These standards provide limits for vibration in terms of Peak Particle Velocity (PPV) below which cosmetic damage to buildings would not be expected.

14.10 BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting provides a complex method for assessing the likelihood of human annoyance for vibration in terms of a vibration dose. These limits are set in terms of accelerationrather than velocity and are duration dependent.

14.11 Given the distance from the site to residential receptors, it is unlikely that building damage or human annoyance would result from construction activities at these receptors.

Noise from Construction Traffic

14.12 During construction, additional traffic may occur on the local road network due to construction vehicles. However, existing flows are usually such that the additional vehicles will have negligible noise impact. For perspective, an approximately 25% increase in vehicle flow is required to result in a 1dBA increase in traffic noise level.

14.13 For the assessment of temporary noise associated with construction traffic, reference will be made to the Calculation of Road Traffic Noise (CRTN). Further advice is also given in the Design Manual for Roads and Bridges (DMRB) for road traffic noise assessment. Significance criteria for assessing the traffic noise will be based on the IOA/IEMA 'Guidelines for Noise Impact Assessment'

14.14 The majority of nearby sensitive receptors will be at sufficient distance that no perceptible vibration from construction traffic would result, as road traffic generally only causes perceptible levels of vibration if there is a significant discontinuity in the road surface such as a pothole or raised manhole cover. The nearest dwellings are approximately 50m away on Long Reach Road,whilst the nearest commercial receptor is approximately 40m to the east at Qualcom. Vibration from construction traffic is therefore scoped out.

Operational Phase

14.15 For the assessment of building services noise, reference will be made to the use of BS 4142:2014+A1:2019. The British Standard provides a method of measuring background noise levels and assessing the likelihood of complaint regarding external noise levels.

14.16 As the proposed development will produce very little noise other than that from any mechanical ventilation/cooling plant which may be required, and this is likely to be limited but unknown at this stage, predictions of operational noise would not be made. In lieu of this, Rating Noise Level limits will be set in accordance with BS 4142:2014+A1:2019.

14.17 Methods employed to control levels of mechanical plant noise, such as those likely to be used,are widely utilised, tried and tested and may include:

- Selection of quiet versions of plant;
- Duct attenuators;
- Plant enclosures;
- Acoustic louvres;
- Reverberation control; and
- Timed operation of certain plant items.

14.18 For the assessment of noise associated with road traffic, reference will be made to the Calculation of Road Traffic Noise (CRTN). Further advice is also given in the Design Manual for Roads and Bridges (DMRB) for road traffic noise assessment. Significance criteria for assessing the traffic noise will be based on the IOA/IEMA 'Guidelines for Noise Impact Assessment'.

Risk of adverse effects on future users of the site from existing noise sources

14.19 Professional Practice Guidance on Planning and Noise (ProPG) provides guidance which reflects the policy and aims set out in NPPF, NPSE and PPG specifically to be used for new residential developments. ProPG sets out a risk-based, sequential two-staged approach to address noise aspects of a Scheme.

14.20 A ProPG Stage 1 site noise risk assessment would be undertaken to provide an early indicationof the suitability of a site from an acoustics perspective. This methodology provides a simple noise scale in which noise levels are correlated with a risk of adverse effect from noise and the pre-planning advice associated with noise levels. It does not, however, make specific referenceto LOAEL and SOAEL.

14.21 It should be noted that a noise risk assessment based on the daytime and night-time L_{Aeq} noise levels at a site does not form the basis of a recommendation for residential development, and so will only form the first aspect of the overall assessment process.

14.22 Stage 1 comprises an initial noise risk assessment which:

- provides an indication of the likely risk of adverse effects if no subsequent mitigation were to be included as part of the development; and
- indicates whether the developed site is considered to be subject to a negligible, low, mediumor high risk of adverse effects from a noise perspective.

14.23 Stage 2 provides a systematic consideration of four key elements, which are:

- Element 1 - demonstrating a "Good Acoustic Design Process";
- Element 2 - observing internal "Noise Level Guidelines";
- Element 3 - undertaking an "External Amenity Area Noise Assessment"; and;
- Element 4 - consideration of "Other Relevant Issues".

14.24 Stage 2 relates the noise level to which the site is subject to LOAEL and SOEAL.

14.25 For the assessment of noise from transport noise sources relating to overheating condition, reference will be made to the use of Acoustics Ventilation and Overheating: Residential Design Guide' (AVO Guide). AVO Guide recommends an approach to acoustic assessments for new residential development that takes due regard of the interdependence of provisions for acoustics, ventilation, and overheating. Application of the AVO Guide is intended to form part of demonstrating good acoustic design as described in the ProPG when considering internal noise level guidelines.

ES Chapter

14.26 The assessment of Noise and Vibration impacts for the ES chapter will be conducted in accordance with the impact assessment guidelines published by the Institute of Acoustics (IOA). The chapter will provide a summary of the relevant planning policy and legislative context for the project and will identify key receptors which may be impacted by the proposal. The impact of construction and operational noise on these receptors will be assessed. The assessment will alsoinclude cumulative and in-combination impacts as a result of other developments in the local area. This will be in relation to building services noise and any increases in road traffic along local roads, with the assessments undertaken in line with the methods outlined above.

14.27 Any mitigation proposals will be outlined in consultation with the project team and client and referred to in the ES. Predicted residual impacts after the implementation of mitigation will be defined. The information presented in the Noise and Vibration chapter may have cross-over with several other disciplines. Liaison with other ES topic specialists will form part of the approach undertaken to ensure consistency in approach and avoid potential conflicts of interests.

Consultation

14.28 Discussions have been held with the EHO (Nick Atkins) at South Cambridgeshire District Council (SCDC) on 30 July 2020 and this has informed the noise and vibration scope. These discussions referred to the Greater Cambridge Sustainable Design and Construction Supplementary Planning Document Adopted January 2020. As a courtesy Adam Finch of Cambridge City Council was also contacted and he referred Mott MacDonald to SCDC.

References

14.29 This scoping chapter has been prepared using the legislation, guidance, policy and British Standards as detailed below:

Legislation

- The Control of Pollution Act (1974)
- The Environmental Protection Act (1990)

Guidance

- World Health Organisation (WHO) Guidelines for Community Noise (1999)
- WHO Night Noise Guidelines for Europe (2009)
- Planning Practice Guidance for Noise (2014)
- Environmental Noise Guidelines for the European Region (2018)
- Professional Practice Guidance on Planning and Noise (ProPG) (2017)

Policy

- The Noise Policy Statement for England (NPSE) (2010)
- National Planning Policy Framework (2018)

- Greater Cambridge Sustainable Design and Construction Supplementary Planning Document Adopted January 2020

British Standards and Standard Methods

- BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound
- British Standard 5228-1:2009+A1:2014 “Code of practice for noise and vibration control on construction and open sites” Part 1: Noise
- British Standard 5228-2:2009+A1:2014 “Code of practice for noise and vibration control on construction and open sites” Part 2: Vibration
- British Standard BS 8233:2014 ‘Guidance on sound insulation and noise reduction forbuildings’
- BS 7445-1:2003 Description and measurement of environmental noise. Guide to quantitiesand procedures
- International Organisation for Standardisation (ISO) 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation (1996)
- Design Manual for Roads and Bridges Volume 11: Environmental Assessment Section 3; “Environmental Assessment Techniques”, 2019
- Department for Transport ‘Calculation of Road Traffic Noise’ 1988

15.0 Odour

Introduction

15.1 As there are no sources of odour associated with the proposed development and based on the technical note produced by Cambridge City Council (CCC) for the Cambridge Water Recycling Centre (CWRC)[36] located adjacent to the proposed development, it is proposed that an odour assessment is scoped out of the EIA. However, in line with the CCC technical note it is proposed that an odour statement will be produced to accompany the application. The odour statement will outline the suitability of the site for the proposed uses in relation to odour emissions from the CWRC. This chapter summarises the proposed approach for the odour statement and provides justification for scoping out of the EIA.

15.2 The odour statement will be prepared by Ove Arup and Partners Ltd (Arup) who have extensive odour experience and are chartered environmentalists or members of the Institute of Environmental Management and Assessment (IEMA), and are therefore considered to be 'competent experts' as per the requirements of the 2017 EIA Regulations37.

Baseline Conditions

15.3 The baseline odour conditions for the proposed development are set out in the CCC technical note and will be summarised in the Cambridge North odour statement.

Study Area

15.4 The study area for the Cambridge North odour note will be the application site boundary.

Potential Impacts

15.5 Potential impacts will be confined to the predicted odour levels at future receptors on the proposed development site as a result of odour emissions from the CWRC and whether they impact on the amenity of the site, taking into consideration its proposed use.

15.6 The proposed development boundary has been compared against the odour exposure contours taken from the CCC technical note (**Figure 15.1**). A small section of the access road within the proposed development overlaps with the $5ou_E/m^3$ contour. As roads are classified as low sensitivity receptors this is likely to be a suitable type of development according to the CCC technical note. The rest of the access road and the northern part of the main site (comprising Class A and B commercial uses) is within $3ou_E/m^3$ contour. These uses are considered medium and low sensitivity receptors and are therefore also likely to be suitable types of development according to the CCC technical note. The rest of the proposed development falls outside the $3ou_E/m^3$ buffer and is therefore not constrained by odour.

[36] Cambridge City Council (2021) Technical note on interpretation of 'Odour Impact Assessment for Cambridge Water Recycling Centre' Report / Study (Odournet, October 2018 – ref. CACC17A_08_final) as a material consideration in determining Planning Applications in the vicinity of Cambridge Water Recycling Centre (CWRC) - Version - Final: 20-05-21
[37] UK Government (2017) Town and Country Planning Environmental Impact Assessment Regulations 2018 No. 571

Figure 15.1: Odour exposure contours around CWRC - extracted from the Technical Note produced by CCC

15.8 Since there are no significant sources of odour included in the proposed development and external impacts are not likely to result in a significant impact, this issue has been scoped out of the assessment.

Approach and Method

15.9 As the development falls within the buffer zones and within the 400m safeguarding area as described in the CCC technical note, an odour note will be produced for the Cambridge North development to accompany the planning application, to explain how the application has regard to the following:

- The CCC technical note[36];
- CCC's Odournet Report[38];
- Olfasense addendum report[39];
- Cambridge Wastewater Treatment Works (W7I - WWTW) 400m Safeguarding Area requirements: Inset Map No. 84;
- Relevant Government, national and industry standards, codes of practice and best practice technical guidance;
- The Institute of Air Quality Management (IAQM) 'Guidance on the assessment of odour for planning' (Version 1.1 - July 2018)[40]; and
- Environment Agency H4 odour giudance[41,42].

Consultation

15.10 There has already been consultation with Cambridge City Council and their advisors. As noted above, the council have produced specific guidance on odour (CCC technical note on the CWRC) that will inform this assessment.

References

[1] Cambridge City Council (2021) Technical note on interpretation of 'Odour Impact Assessment for Cambridge Water Recycling Centre' Report / Study (Odournet, October 2018 – ref. CACC17A_08_final) as a material consideration in determining Planning Applications in the vicinity of Cambridge Water Recycling Centre (CWRC) - Version - Final: 20-05-21

[1] UK Government (2017) Town and Country Planning Environmental Impact Assessment Regulations 2018 No. 571

[1] Cambridge City Council (2018) 'Odour Impact Assessment for Cambridge Water Recycling Centre' (Odournet, October 2018 – ref. CACC17A_08_final)

[1] Olfasense addendum report titled 'Addendum Report: Updated odour dispersion modelling for Cambridge Water Recycling Centre, 21 December 2020 - Client: South Cambridgeshire District Council / Report Number: CACC19A_06 / Project Code CACC19A'

[1] Bull et al (2018). IAQM Guidance on the assessment of odour for planning – version 1.1, Institute of Air Quality Management, London. www.iaqm.co.uk/text/guidance/odour-guidance-2018

[1] Environment Agency, H4 Odour Management (March 2011)

[1] Environment Agency draft H4 Horizontal Guidance for Odour, 2003.

[38] Cambridge City Council (2018) 'Odour Impact Assessment for Cambridge Water Recycling Centre' (Odournet, October 2018 – ref. CACC17A_08_final)
[39] Olfasense addendum report titled 'Addendum Report: Updated odour dispersion modelling for Cambridge Water Recycling Centre, 21 December, 2020 - Client: South Cambridgeshire District Council / Report Number: CACC19A_06 / Project Code CACC19A'
[40] Bull et al (2018). IAQM Guidance on the assessment of odour for planning – version 1.1, Instituteof Air Quality Management, London. www.iaqm.co.uk/text/guidance/odour-guidance-2018
[41] Environment Agency, H4 Odour Management (March 2011)
[42] Environment Agency draft H4 Horizontal Guidance for Odour, 2003.

16.0 Socio-Economics

Introduction

16.1 The Socio-economic Chapter will consider the impact of the Proposed Development's construction and operation on employment, public open space and retail. Health impacts are covered in the Health Chapter.

16.2 The chapter will be prepared by Simon Elliott BSc MSc and Juliet Clark BA MSc MRTPI AIEMA.

16.3 There is no specific legislation that influences the methodology of the socioeconomic assessment, but it is informed by policy and guidance documents at the national and local level. This assessment will be prepared using a methodology to be provided in the ES. The methodology for employment aspects has been guided by the Treasury's Green Book for Appraisal and Evaluation in Central Government.

Baseline Conditions

16.4 The ES will describe the baseline conditions of the Application Site based on desk study and field survey information. Table 16.1 lists the information to be collected drawing on a wide range of resources including:

- National Planning Policy Framework (NPPF) and National Planning Policy Guidance;
- SCDC and Cambridge City Local Plans and their evidence base;
- Emerging Greater Cambridge Local Plan and evidence base;
- North East Cambridge Area Action Plan and evidence base;
- UK Industrial Strategy;
- Cambridge and Peterborough Independent Economic Review 2018;
- Cambridge and Peterborough Industrial Strategy 2019;
- Cambridge Employment Land Study Innovation Districts Case Studies 2019
- Cambridge City Council Anti-Poverty Strategy 2017-2020;
- SCDC and CCC (2020) Sustainable design and construction SPD;
- Cambridge County Council (2015) Strategy for supporting New Communities 2015-2020;
- Cambridge County Council (Oct 2015) Strategy for Building Resilient communities;
- North East Cambridge Retail Evidence Statement, Feb 2020
- Cultural and Community Facilities Audit Provision 2019
- Cultural Place Making Strategy June 2020
- ONS, BRES and other national survey data.

Table 16.1 Baseline Data

TOPIC	DATA TO COLLECT
LABOUR FORCE	
Economic profile of the population	Economic activity and employment rates, industrial and occupational characteristics, skills, location of work, earnings,
EMPLOYMENT	
Provision of employment within Cambridge.	Existing employment onsite, employment in the Study Area / Cambridge and Cambridgeshire, job density, job vacancies, wages, industrial and occupation profile of local jobs, Size of business
Economic policy objectives and projections	Documented policy of Cambridge City Council and SCDC, LEP, Greater Cambridge Partnership with respect to job creation and productivity
Gross Value Added	GVA per worker
Office / R&D stock and proposed development	Office stock and quality, proposed development, completion rates
OPPORTUNITIES FOR SOCIALISING, BUILDING SOCIAL CAPITAL AND EXCERCISING	
Local open space provision	Access to and quality of public realm, green and blue infrastructure
RETAIL	
Existing local facilities	Location and duration of local convenience and comparison retail. Type and location of other A class uses in the local area
Accessibility	Accessibility of existing retailing by walking, cycling and public transport
Retail need	Identified retail need in North East Cambridge (desk top study of LA evidence)
New onsite provision	Description of the proposed development

Design and Mitigation Measures

16.5 The preliminary design of the Proposed Development incorporates a range of measures that assist with reducing negative socio-economic impacts and adding socio-economic benefits. These measures include:

- Public open space
- Employment
- Infrastructure to facilitate active modes of travel.
- Flexible mixed-use space.

16.6 The need for additional mitigation of impacts is not known at this early stage, but the socio-economic assessment will provide details of the mitigation incorporated into the Proposed Development together with any additional measures.

Potential Socio-Economic Impacts and Approach

16.7 Different socioeconomic impacts will arise during the construction period and during operation (i.e. once the development is occupied). Table 16.2 lists the impacts and their effects in relation to the noted geographical areas to be covered in the ES:

Table 16.2 Potential Impacts and Effects

IMPACTS AND EFFECTS	GEOGRPAHY
• Impact of construction on employment during the construction process	Site, Greater Cambridge
• Employment effects arising from the occupation of the commercial and mixed-use spaces	Site, Greater Cambridge
• Access to open space	Site, walking catchments
• Access to space for socialising and supporting community development.	Site, walking catchments
• Impact of new onsite retail provision on retail accessibility	Site, walking and cycling catchments

16.8 Socio-economic effects are complex, and in some cases, it is difficult to accurately predict the precise nature or scale of such impacts. Therefore, some of the effects will be assessed qualitatively in terms of whether they are beneficial or adverse; short term or long term; temporary or permanent. Quantitative analysis is included where appropriate, for example: employment and the demand for school places.

16.9 Each impact, whether adverse or beneficial, is likely to have different levels of significance depending on its magnitude and the geographic and administrative context in which it is considered.

16.10 The relative significance of an effect is largely a product of the sensitivity of the identified receptor (baseline sensitivity) and the magnitude and duration of the impact.

16.11 The baseline sensitivity reflects the geographic scale of sensitivity and the sensitivity of the resource. For example, in relation to employment the impact of job creation within an internationally recognised economic cluster would be more important than local casual unskilled jobs. However, under circumstances of high unemployment, all jobs are of great value and hence the baseline sensitivity would be greater. The receptors we will consider include local residents (on and off site) seeking retail and leisure opportunities, children of secondary school age, residents looking for work, residents in Cambridge and Cambridgeshire that could benefit from the impacts on Gross Value Added (GVA).

16.12 Assessment of the magnitude of an effect is based on its scale and duration. In this assessment, effects are either beneficial or adverse in nature and their magnitude is described as either; High, Medium, Low or Negligible.

16.13 Regarding the duration of an effect, if an effect is associated with the site preparation and construction phase of development then the duration is described as short to medium-term. If an effect is associated with the completed development and its operation, then the effect duration is considered long-term. Table 16.3 below describes the magnitude of effects. Moderate or major are considered to be ‘significant’ and those which are minor are ‘not significant’

Table 16.3 Magnitude of Impacts

MAGNITUDE	CHARACTERISTICS OF CHANGE
Major Beneficial	The proposed development would result in substantial additional local economic benefits in terms of jobs and wealth
Moderate Beneficial	The proposed development would result in significant additional local economic benefits in terms of jobs and wealth
Minor Beneficial	The proposed development would result in relatively minor additional local economic benefits in terms of jobs and wealth
Neutral	The proposed development would not result in any meaningful change to the receptor/ resource.
Minor Adverse	The proposed development would result in relatively minor losses to the local economy in terms of jobs and wealth
Moderate Adverse	The proposed development would result in significant losses to the local economy in terms of jobs and wealth
Major Adverse	The proposed development would result in relatively substantial losses to the local economy in terms of jobs and wealth.

Table 16.4 Significance of Effects

		Baseline Sensitivity				
		Very High	High	Moderate	Low	Very Low
Magnitude of Change	Major Beneficial	Major Beneficial	Major-Moderate Beneficial	Moderate Beneficial	Moderate/Minor Beneficial	Minor Beneficial
	Moderate Beneficial	Major-Moderate Beneficial	Moderate Beneficial	Moderate/Minor Beneficial	Minor Beneficial	Minor/Negligible Beneficial
	Minor Beneficial	Moderate Beneficial	Moderate/Minor Beneficial	Minor Beneficial	Minor/Negligible Beneficial	Negligible
	Neutral	Negligible	Negligible	Negligible	Negligible	Negligible
	Minor Adverse	Moderate Adverse	Moderate/Minor Adverse	Minor Adverse	Minor/Negligible Adverse	Negligible
	Moderate Adverse	Major-Moderate Adverse	Moderate Adverse	Moderate/Minor Adverse	Minor Adverse	Minor/Negligible Adverse
	Major Adverse	Major Adverse	Major-Moderate Adverse	Moderate Adverse	Moderate/Minor Adverse	Minor Adverse

Source: Bidwells 2019

Employment Impacts Methodology

16.14 Drawing on information from the Applicant about the Proposed Development's, construction timeframe and operation, the number of jobs created during construction and once the facility is operational will be calculated using job density ratios. These 'gross impacts' will be adjusted to take account of:

- Leakage - the proportion of outputs that benefit those outside the projects target area.
- Displacement/ deadweight - the replacement of outputs that are already present on the Site.

- Substitution - some outputs will be achieved but at the expense of outputs elsewhere.

16.15 These adjustments deliver the net impacts of the Proposed Development, i.e. the effect that can be attributed to the Proposed Development that would not have otherwise occurred.

16.16 A further calculation is necessary to allow for the indirect and induced effects, that is the further economic activity (jobs, expenditure, income) generated offsite as a result of the Proposed Development. These comprise:

- Demand generated by the proposed development, in relation to construction materials and supplies;
- Jobs arising offsite through the increased demand for goods and services by the residents of the development; and
- Jobs resulting from employees' expenditure on local goods and services.

16.17 This is calculated using multipliers. In determining the multiplier factor, the following points are relevant:

- The size of the local area, the larger the geographical area, the greater the multiplier;
- The structure of the local economy and the strength of its economic linkages, and hence the ability of the local economy to retain economic activity within its own boundaries;
- The nature of direct employment created, and hence the disposable income of workers;
- The nature of the relationship between revenue and employment within a given enterprise, since in practice the extent to which secondary businesses can absorb a certain amount of additional demand without the need for further recruitment will vary between businesses; and
- The time period of evaluation, since over time it is expected that local businesses will adapt more fully to the demand made on their services and reduce the extent of leakage out of the local economy.

Scoped Out

16.18 All topics relating to residential development and an increase in residential population are scoped out as there are no residential uses within the proposed development.

Consultation

16.19 None

Cumulative Impacts

16.20 The methodology for assessment cumulative effects will be set out in the ES in detail. This will draw on standard EIA methodologies. Where other projects are in the public domain, available information will be collected, and an assessment of likely significant effects will be undertaken.

References

HM Government (2018). Treasury's Green Book for Appraisal and Evaluation. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf (accessed 25/11/2019)

17.0 Soils and Groundwater

Introduction

17.1 This chapter presents the proposed scope and methodology of the assessment for Soils and Groundwater. Consideration is given to the potential physical effects of the proposed development such as changes in ground stability and soil erosion, effects on geology as a valuable resource, effects associated with existing soil and groundwater contamination, effects associated with the introduction of new contaminative substances and/or migration pathways and effects associated with re-use of soils and generation of waste soils.

Baseline Conditions

17.2 A summary of the baseline ground conditions is presented below based on freely available information. A Phase 1 geo-environmental desk study will be carried out to establish a detailed baseline for the site and to inform a preliminary conceptual site model, prior to preparation of the Environmental Statement.

Site History

17.3 Freely available historical maps indicate that the site comprised fields before being developed as railway sidings in the early 20th Century. Ballast pits were present in the north eastern part of the site at this time, extending off-site to the north. The sidings were extended across the site during the 20th Century and a series of buildings was constructed along the sidings towards the west of the site. The sidings within the site boundary were no longer in use by 2017.

17.4 The surrounding area is shown as fields on the earliest available maps, with the main line railway present to the east and south west of the site. The 1888 to 1913 map records various pits surrounding the site and sewage works to the north of the site. The 1937 map indicates the sewage works to have extended southwards towards the northern boundary of the site and residential development has taken place to the west and south. Aerial imagery from 2021 indicates the sewage works is still present, an industrial estate is present to the west of the site, Cambridge Business Park has been developed to the south west of the site and Cambridge North Station has been constructed to the south.

Geology and Hydrogeology

17.5 Geological mapping (British Geological Society 1:50,000 solid and drift geology map: sheet 188, Cambridge, 1981) indicates that superficial deposits comprising River Terrace Deposits (sand and gravel) are present across the majority of the site with the exception of the northern area. Underlying bedrock comprises clay and mudstone of the Gault Formation. Although not recorded on the geological mapping, it is considered likely that Made Ground exists on the site due its to historical use.

17.6 The Environment Agency has classified the superficial deposits as a Secondary A Aquifer, and bedrock of the Gault Formation as Unproductive Strata. The site is not located within a groundwater source protection zone.

Previous Ground Investigations

17.7 A ground investigation scoped by Mott MacDonald was undertaken by Socotec in August 2017 on part of the site and in the wider area. Three cable percussion boreholes and eight dynamic windowless samples were located in the south west of the site, with no coverage across the remainder of the site.

17.8 Based on exploratory hole locations within the site boundary, geology beneath the site comprised Made Ground underlain by River Terrace Deposits (gravelly sands and clays) and Gault Formation (clay). Made Ground was encountered in all exploratory hole locations to depths of between 0.45m and 2.00m as black, occasionally reddish-brown gravelly ash, sand, and occasional clay. Gravels consisted of anthropogenic materials such as railway ballast, clinker and brick, and mudstone, flint, chert, quartzite, and slate. Water strikes were encountered between 0.80m and 1.80m in Made Ground and River Terrace Deposits. The exploratory hole logs indicate that no visual or olfactory evidence of contamination was observed.

Hydrology

17.9 The River Cam is located approximately 500m to the east of the site at its closest point. The 'First Public Drain' is located approximately 200m to the west of the main portion of the site, and flows beneath Cowley Road, merging with an unnamed surface water drain which runs parallel with Cowley Road within the site boundary.

Authorised and Historical Landfills

17.10 There are no authorised or recorded historical landfills within 1km of the site.

Waste Sites

17.11 Current mapping indicates that a Veolia commercial waste depot is located approximately 110m to the west of the main portion of the site, and directly adjacent to the site boundary along Cowley Road. Cambridge Water Recycling Centre is located 210m to the north west of the site at its closest point.

Unexploded Ordnance

17.12 Unexploded ordnance (UXO) risk maps published by Zetica indicate the site is in a low risk zone

Geology as a Valuable Resource

17.13 The Cambridgeshire and Peterborough Minerals and Waste Local Plan 2016 (adopted July 2021) indicates that River Terrace Deposits underlying the site are designated as a Mineral Safeguarding Area (MSA) for sand and gravel.

17.14 An aggregates railhead extends northwards from the northern site boundary. The Cambridgeshire and Peterborough Minerals and Waste Local Plan 2036 (adopted July 2021) classifies the existing railhead as a Consultation Area.

Geodiversity

17.15 Open source government data does not identify any geological Sites of Special Scientific Interest (SSSI), any regionally or locally important geological sites or non-designated outcrops/features of interest within the study area or within a 250m buffer of the site.

Potential Impacts

Construction

17.16 Potential impacts which may arise during construction of the proposed development are associated with:

- sterilisation of sand and gravel in the MSA;
- erosion or loss of soil which may be associated with vegetation clearance, increased surface water run-off on bare ground, movement of construction plant around the site, earthworks, and construction of hardstanding;
- disturbance and mobilisation of existing soil and groundwater contamination, for example via generation of soil-derived dust and run-off from stockpiles and open excavations;
- remediation of legacy soil and/or groundwater contamination from current and historical uses of the site;
- creation of new migration pathways between sources of contamination and receptors, for example during foundation works and service installation;
- introduction of new sources of contamination such as fuels and oils associated with mechanical plant used for construction of the proposed development which may be released to ground via spills or leaks; and
- generation of soil arisings which may not be suitable for reuse within the proposed development or for which there may be no scope for reuse.

Operation

17.17 Potential impacts and effects which may arise during the operation phase of the proposed development are associated with:

- sterilisation of sand and gravel in the MSA;
- the presence of predominantly hardstanding in the proposed development which will reduce the potential for surface water infiltration and mobilisation of residual contamination at the site and minimise the potential for generation of soil-derived dust.

17.18 Agricultural soils have been scoped out of the impact assessment, as the site does not comprise agricultural land.

Approach and Method

Physical Effects of the Development

17.19 Physical effects can include changes in topography, soil compaction, soil erosion and ground stability. A qualitative approach will be used for the assessment of physical effects, assessing the potential impact on the baseline conditions as a result of earthworks, foundation solutions, and construction methods associated with the proposed development.

Effects on Geology as a Valuable Resource

17.19.1 Effects on geology as a valuable resource may include the sterilisation of mineral resources. The impact assessment will follow a qualitative approach based on the type and distribution of geological resource and its associated value, and the extent to which it will be sterilised, lost or damaged as a result of the proposed development.

Effects Associated with Contamination

17.20 Effects associated with existing soil and groundwater contamination, potential contamination associated with the proposed development and re-use of soil/generation of waste soil will be assessed using a two-stage risk-based approach in accordance with industry guidance set out in Land Contamination Risk Management and EIA Good Practice Guidance. For the purposes of this chapter, groundwater will be considered within the Ground Conditions topic only as a receptor to and pathway for the migration of contamination, rather than as a resource.

17.21 The first stage will comprise a land contamination risk assessment. A Phase 1 geo-environmental desk study will be carried out to determine the baseline for the Site, identifying plausible sources of contamination, receptors to contamination and pathways between the two. The sources, pathways and receptors will be presented in a Preliminary Conceptual Site Model with a qualitative risk assessment of each potential contaminant linkage based on consideration of probability and consequence in accordance with CIRIA C552 and R&D 66. This will form the baseline land contamination risk assessment.

17.22 The second stage comprises the impact assessment. Land contamination risk assessments will be completed for the construction phase and the operation phase, using the same qualitative risk assessment approach as at baseline. The baseline land contamination risk assessment will then be compared with the construction phase land contamination risk assessment and with the operation phase land contamination risk assessment to enable predicted changes in risk to be determined as a result of construction and operation. This will allow for effects to be identified which are either beneficial or adverse, and major, moderate, minor or negligible. Whether or not effects are considered to be significant will be determined based on the sensitivity or importance of the receptor and the magnitude of potential impact (change). Major or moderate beneficial and adverse effects will be classed as ‘significant’.

Mitigation Measures

17.23 Mitigation measures implemented as part of the proposed development are likely to include:

- completion of ground investigation and gas and groundwater monitoring to assess potential contaminant linkages identified in the Phase 1 desk study and to characterise ground conditions at the site. Ground investigation will be carried out in accordance with BS5930:2015+A1:2020,BS10175:2011+A2:2017, and Land Contamination: Risk Management guidance;
- completion of a geo-environmental interpretative report, including generic quantitative risk assessment for human health, gas risk assessment and preliminary controlled waters risk assessment, to determine potential unacceptable risks to the identified receptors and inform the requirement for detailed quantitative risk assessment and/or remediation;
- completion of any remediation and associated verification required to address potential unacceptable risks based on the proposed end use of the Site (if relevant);
- design of the proposed development to minimise the effects associated with ground conditions constraints;
- design of the proposed development to maximise the potential for reuse of materials on-site;
- design of drainage strategy and SuDS features to minimise the risk of mobilising residual soil and groundwater contamination;
- preparation of a Construction Environmental Management Plan to set out the measures that all contractors are required to follow to ensure the impact of the construction works on the environment is minimised;
- preparing a Site Waste Management Plan and Materials Management Plan;
- completion of a foundation works risk assessment prior to the commencement of construction works;
- programming of earthworks to avoid periods of inclement weather to reduce the potential for erosion of soils and an increase in surface water run-off with a high sediment load;
- practicing good stockpile management during the construction phase such as sealing to prevent deterioration of soils and to minimise the potential for generation of soil-derived dust;
- use of dust suppression across areas of bare ground in dry and/or windy weather conditions;
- deployment of drip trays and spill kits with mechanical plant in use around the site during construction;
- ensuring potentially polluting substances required during construction are stored in bunded containers away from surface watercourses;
- establishing a designated bunded re-fuelling area on hardstanding during the construction phase;

Consultation

17.24 Consultation will be undertaken with South Cambridgeshire District Council and the Environment Agency, regarding the approach to assessing impacts and effects of the proposed development on the identified receptors.

18.0 Transport

Introduction

18.1 This chapter of the Environmental Statement (ES) will present the methodology and scope for assessing the impacts and associated effects of the proposed development on traffic and transportation. Information will additionally be provided on the existing transportation baseline,and the potential impact and effects during both the construction and operational phases, drawing upon the content of the Transport Assessment which would form an appendix.

Baseline Conditions

18.2 Baseline conditions will be reviewed in relation to the following:

- Site location
- The local highway network including Milton Avenue, Cowley Road, the Cambridgeshire guided busway and the A1309 Milton Road.
- Pedestrian accessibility (including Public Rights of Way).
- Cycle accessibility (including national and local cycle routes within the study area).
- Public transport accessibility (local bus and rail services).
- Local highway safety. This will be reviewed using collision data for the surrounding roads for the most recent five-year period available. Accident data will be sought from the Local Highway Authority. For the purposes of the assessment, a collision cluster will be defined asfive or more collisions within a 30m radius during the analysis period.
- Existing traffic flow information. This will comprise 2017 traffic flow data for Cowley Road and the A1309 Milton Road corridor. The data has been used to inform the recent North East Cambridge Area Action Plan and has been agreed as suitable for use by Cambridgeshire County Council (CCC) highways. This will be supplemented by additional Automatic Traffic Count data at the southern end of Milton Road at the junction with Arbury Road and Union Lane obtained from DfT and CCC count points. The baseline traffic data will be factored up to an appropriate base year to be agreed with CCC.

Potential Impacts

18.3 The 'Guidelines for the Environmental Assessment of Road Traffic' by the Institute of Environmental Assessment (now IEMA) from 1993 will be used to inform the technical scope ofthis assessment. This IEMA guidance lists the following environmental impacts relevant to transportation that should be considered as part of an assessment:

- Noise
- Vibration
- Visual Impact
- Severance;
- Driver delay;

- Pedestrian delay;
- Pedestrian amenity;
- Fear and intimidation;
- Accidents and safety;
- Air pollution;
- Ecological impact;
- Heritage and conservation areas; and
- Hazardous loads.

18.4 For the proposed development, there are not anticipated to be any hazardous loads associated with the construction, operation or decommissioning of the development, and therefore is it proposed that this element be scoped out of the assessment.

18.5 Noise, vibration, visual impact, air pollution, ecological impact and heritage and conservation would be covered by other chapters within the EIA and would not therefore be assessed within the Transport chapter.

Construction Phase

18.6 An increase in construction vehicles, including Heavy Goods Vehicles (HGVs), travelling to and from the site is expected during the construction phase. As a result, there may be occasional temporary nuisance where construction traffic is encountered by local road users. The increase in construction vehicles in the local area has the potential to impact on driver severance, driver delay, pedestrian severance, pedestrian delay, pedestrian amenity, fear and intimidation, and accidents and safety in/along routes within the study area. The severity of the impact will be determined and assessed once construction vehicle trip generation figures have been determined.

Operational Phase

18.7 Forecast trip generation figures are required to assess the potential operational phase impacts. Any increase in vehicular movements associated with the development during operation has the potential to impact on driver delay, pedestrian delay, fear and intimidation and accidents and safety.

Approach and Method

18.8 The spatial scope of the assessment will be defined using the IEMA 1993 guidelines. IEMA guidelines provide the following two broad rules-of-thumb on determining the geographical extent of assessments:

- Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
- Include any other specifically sensitive areas where traffic flows will increase by 10% or more.

18.9 Once the trip generation figures for the proposed development have been calculated, the study area will be defined. If the trip generation numbers associated with the development do not meet

the thresholds detailed above during construction or operation, the study area for the impacts related to traffic and transport will be defined on the basis of professional judgement.

18.10 The transportation chapter of the ES will identify particular groups or locations within the identified study area which may be sensitive to changes in traffic conditions. These will include the following (as set out in the IEMA guidelines):

- People at home;
- People in work places;
- Sensitive groups including children, the elderly and disabled;
- Sensitive locations e.g. hospitals, churches, schools, historical buildings;
- People walking;
- People cycling;
- Open spaces, recreational sites, shopping areas;
- Sites of ecological/nature conservation value; and
- Sites of tourist/visitor attraction.

18.11 Principles set out in the Guidelines for the Environmental Assessment of Road Traffic (IEMA, 1993) will be used to determine the sensitivity of the identified groups within the study area. The receptors and their corresponding sensitivity which will be used to inform the assessment are setout below.

18.12 Links or locations containing “High” sensitivity receptors will include:

- Schools, colleges and other educational institutions;
- Hospitals, surgeries and clinics;
- Retirement/care homes for the elderly or infirm;
- Roads used by pedestrians with no footways;
- Links with high pedestrian or cycle flows’
- Accident blackspots; and
- Conservation areas.

18.13 Links or locations containing “Medium” sensitivity receptors will include:

- Parks and recreation areas;
- Shopping areas;
- Areas containing a combination of residential and office amenity; and
- Links used by pedestrians with narrow footways.

18.14 Links or locations containing “Low” sensitivity receptors will include:

- Open space;
- Tourist/visitor attractions;
- Historical buildings;

- Churches;
- Light industrial areas' and
- Bus only links.

18.15 A full list of potential receptors and their corresponding sensitivity with relevance to the proposed development will be identified through a thorough desktop review. The effect of the proposed development on the sensitive receptors will be evaluated by combining the assessment of impact magnitude and receptor sensitivity. The effects will be classified as beneficial or adverse and temporary or permanent. Mitigation measures will additionally be proposed accordingly.

Consultation

18.16 The development has been subject to discussion with highways and transport officers at Cambridgeshire County Council to inform the emerging transport approach for the site. Further consultation and discussions will be undertaken as the assessment progresses.

References

18.17 The traffic and transportation impact assessment for the Environmental Statement will be undertaken with due regard and reference to the key national (UK and England) guidance documents. The following documents will be considered as part of the assessment:

- Guidelines for the Environmental Assessment of Road Traffic, The Institute of Environmental Assessment (now the Institute of Environmental Management and Assessment (IEMA)), 1993.

19.0 Wind

Introduction

19.1 The ES will identify any likely significant effects of the Proposed Development on the wind environment. The assessment will be undertaken by Giulia Matteoni (PhD, CEng IMechE) ofArup.

19.2 A safe and comfortable wind climate is integral to the success of any development. New buildings can generate wind acceleration at ground level which could result in discomfort to pedestrians. An assessment of the wind microclimate is necessary to identify any potential impacts that the Development may have on sensitive receptors adjacent to as well as within the Development site during both construction and operational phases.

Baseline Conditions

19.3 The baseline configuration will comprise the existing site and any existing permanent buildings, which currently accommodates a car park and vacant land. A review of the local wind climate (prevailing wind directions and strength) will be undertaken using long-term wind records measured at several weather stations in the area of Cambridge and our previous knowledge of wind climate in the area. Environmental wind conditions at the existing site will be assessed usinga qualitative desk study approach, supported by CFD analysis; the analysis method is described under ‘Approach and Method’.

Potential Impacts

19.4 Given the height and wind exposure of the Proposed Development, the possibility of windiness levels in excess of tolerable limits for intended pedestrian, cyclist and vehicularactivities should be considered. Potential effects include the reduced usability of sensitive or frequently used areas such as entrances, pedestrian pathways, cycling paths, etc.

Approach and Method

19.5 A qualitative desk study assessment of the likely wind conditions within and around the Proposed Development will be initially carried out. Possible means of mitigating or avoiding undesirable wind effects, which may include adjustments to building massing or to the landscaping scheme, will be identified. If the proposed Development is to be built in phases, environmental wind conditions at intermediate construction stages will also be assessed.

19.6 The desk study assessment will be based on a review of architectural drawings provided by the design team, evaluation of aerial views of the site and surroundings, and Arup’s previous experience of wind tunnel testing of developments with similar wind exposure.

19.7 A CFD model of the existing site (baseline) and of the Proposed Development and surrounding buildings will be developed. The CFD study will be completed for sixteen wind directions for each scenario. Results of the CFD analysis will be presented in terms of the Lawson comfort and safety criteria as described below. Wind speed-up ratio contour plots, which will be used to describe wind

flow mechanisms for key wind directions, and areas of wind acceleration/deceleration, will also be produced.

19.8 The criteria used to describe the acceptability of windiness in key areas are those of T.V. Lawson of Bristol University, extracted from "The evaluation of the windiness of a building complex before construction", T.V. Lawson, London Docklands Development Corporation. These include acceptable tolerable limits for activities such as 'Sitting', 'Standing', 'Strolling' and 'Business Walking'. They also describe conditions that are unsafe for public use, on the basis of two categories; 'able-bodied' and 'general public'. The former describes conditions that may be unsafe for less able-bodied members of the public (e.g. elderly, injured or cyclists) and the latterdescribes conditions that may be unsafe for all members of the public.

19.9 Windiness resulting from the assessment will be compared to the required levels for intended use to identify areas where significant effects may occur.

- A significant adverse effect will be defined as an area where wind conditions would be higher than the required levels for the intended use as a result for the proposed development. Exceedances of the distress criteria would present a potential safety risk in areas regularly used by pedestrians. Such conditions would be unacceptable for areas accessed by the general public and will be therefore considered to be significant adverse effects.
- An increase in windiness would be considered not significant if the conditions remain suitable for the intended activity.

19.10 Recommendations for local mitigation will be provided in areas where local windiness may exceed acceptable limits for intended pedestrian use. Particular emphasis will be made on sensitive or frequently used areas, such as ground level entrances, outdoor seating spaces, etc.The residual effects of the proposed Development on the local wind micro-climate with proposedmitigation in place will be addressed.

Consultation

19.11 Consultation will be carried out to inform the assessment as necessary.

References

"The evaluation of the windiness of a building complex before construction", T.V. Lawson,London Docklands Development Corporation (1990)

20.0 Proposed Structure of ES

20.1 The EIA will be compiled into an Environmental Statement, which will be produced in accordance with the EIA Regulations. The ES will comprise the following documents:

Volume 1: Main Report

- Chapter 1 Introduction
- Chapter 2 Methodology
- Chapter 3 Site and Context
- Chapter 4 Proposed Development (including alternatives)
- Chapter 5 Policy Context
- Chapter 6 Air Quality
- Chapter 7 Climate Change
- Chapter 8 Cultural Heritage
- Chapter 9 Ecology
- Chapter 10 Flood Risk and Drainage
- Chapter 11 Human Health
- Chapter 12 Landscape and Visual
- Chapter 13 Lighting
- Chapter 14 Noise and Vibration
- Chapter 15 Socio-Economics
- Chapter 16 Soils and Groundwater
- Chapter 17 Transport
- Chapter 18 Wind
- Chapter 19 Cumulative Effects and Safeguarded Sites
- Chapter 20 Summary of Mitigation Measures and Residual Effects

Volume 2: Technical Appendices

- Including all supporting technical appendices and relevant standalone documents.

Volume 3: ES Non-Technical Summary

APPENDIX 1
RED LINE BOUNDARY

APPENDIX 2
CULTURAL HERITAGE BASELINE ASSESSMENT

APPENDIX 3
HIA APPENDIX AND STUDY AREA MAP

APPENDIX 4
LVIA BASELINE

BIDWELLS