Water Eaton

PR6a : Land East of Oxford Road

Environmental Statement Appendix 4.1:
EIA Scoping Request

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Land East of Oxford Road

Cherwell District Council Partial Review Local Plan Site PR6a

Environmental Impact Assessment Scoping Request

Land East of Oxford Road

EIA Scoping Report

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Contents

1. Introduction

1.1. Christ Church and The Water Eaton Estate (the Applicants) intend to submit an outline planning application to Cherwell District Council (the Council) seeking planning consent for Site PR6a allocated in the Cherwell District Council Partial Review Local Plan. This report is provided in support of a request for the Environmental Impact Assessment scoping opinion of the Council as the local planning authority.

Background

1.2. The Site is included in the Cherwell Local Plan as Policy PR6a Strategic Allocation. Policy PR6a allocates the Site for mixed-use development including around 690 dwellings, a two form entry primary school, a local centre and recreation space. The strategic allocation extends to approximately 48 hectares of land to the east of the A4165 Oxford Road shown within the red line boundary on the Site Location Plan SK129 (see Appendix 1: Section 16). The Applicants are in the process of preparing a development proposal for land within the PR6a allocation. The planning submission will be an outline application (with all matters reserved with the exception of road access points into the Site).

1.3. Before submitting a planning application for the Proposed Development, the Applicants will undertake an Environmental Impact Assessment (EIA). EIA is a process that examines the likely significant environmental effects of developing a proposal. This information is taken into account by the planning authority when making a planning decision.

EIA scoping

1.4. The EIA for the Proposed Development will be undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations').

1.5. Regulation 15 of the EIA Regulations enables a person to ask the relevant planning authority to confirm in writing their opinion as to the scope, and the level of detail, of the information to be provided in the ES. This report accompanies a request for the Council to adopt an EIA scoping opinion under Regulation 15 of the EIA Regulations.

1.6. In order to determine the likely scope of the EIA, this report has identified:

- the key characteristics of the Site and the environmental baseline through desk and field studies;
- further survey work that is proposed;
- initial consideration of the potential sources and nature of environmental impacts; and
- definition of the assessment methodologies to be used in each study area (where available).

1.7. A series of baseline studies have been undertaken to establish the baseline environment for this scoping report. Some studies are ongoing and can be tailored to advice offered in response to this scoping request.

Report structure

1.8. Regulation 15(2) of the EIA Regulations identifies that a request seeking a scoping opinion must include:

(i) a plan sufficient to identify the land;
(ii) a brief description of the nature and purpose of the development, including its location and technical capacity;
(iii) an explanation of the likely significant effects of the development on the environment; and
(iv) such other information or representations as the person making the request may wish to provide or make;'

1.9. This information is contained in this scoping report, which is structured into Sections as follows:

- Section 2 - describes the Site, the surrounding context, and identifies sensitive receptors;
- Section 3 - provides information about the development proposed;
- Section 4 - outlines the approach that will be undertaken in preparing the EIA;
- Section 5 - identifies the effects considered to be insignificant, and 'scoped out' of the EIA;
- Sections 6 to 14 - provide a review of the relevant baseline, outline the potential environmental effects and the proposed scope of the assessment, under individual topic headings. Section 15 sets out the proposed approach to the consideration of climate change effects in the ES; Section 16 presents the proposed structure of the Environmental Statement;
- Section 15 – lists the proposed ES contents.

1.10. On receipt of this report, the Council should consult with statutory bodies (Regulation 2(1)) before adopting their formal EIA Scoping Opinion. The Scoping Opinion will confirm the key environmental considerations to be assessed.

2. The Application Site

Site context

2.1. The Site adjoins the Cutteslowe neighbourhood and is approximately 5km north of Oxford city centre. The land is in the control of Christ Church (St. Frideswide Farm), and The Water Eaton Estate.

2.2. An existing property, Pipal Cottage on Oxford Road, is show within the boundary of the PR6a local plan allocation, but is not included in the planning application site.

The Application Site

2.3. Currently, the land is in agricultural use. The western boundary of the Site fronts Oxford Road and the northern boundary adjoins Oxford Parkway Park and Ride site. To the east, the Site boundary crosses an open field, then follows field boundaries around St. Frideswide Farm to the south, where the southern boundary adjoins Cutteslowe Park, Banbury Road North Sports Ground, and an adjacent field. The land to the south of the Site boundary is within the administrative area of Oxford City Council. The land at St Frideswide Farm within Oxford City is allocated for residential development as site SP24 in the adopted Oxford City Local Plan.

2.4. Access to St. Frideswide Farm is via a track from Oxford Road. The Site is also crossed by two Public Rights of Way. PRoW 229/9/30 is a bridle path and a private road that runs from Oxford Road across to the east, and PRoW 229/8/10 is a footpath that crosses the southern part of the Site. Both paths are in an east-west orientation and provide connections to Water Eaton approximately 1.2 km north-east of the Site.

2.5. Across the Site, field ditches and the topography allow surface water to drain in an easterly direction. These connect with a network of drainage ditches that ultimately discharge into the River Cherwell. The Cherwell River flows in a southerly direction to join the River Thames south of Oxford City.

2.6. The Oxfordshire Historic Environment Records (HER) show four non-designated heritage assets within the Site boundary, including the remains of two bronze age barrows, possible Roman 'ridgeway', and a milestone.

2.7. The field boundaries within the Site are delineated by mature, native hedgerows of variable species composition and structure. The majority of the hedgerows are relatively species rich and regularly managed (c.1.5m high). A small number of species-poor hedgerows are present, alongside the track leading to the Water Eaton estate, and along the southern and eastern boundaries of the south-western field.

2.8. Owing to their species diversity and maturity, the hedgerows are considered to be of Local ecological value, forming a key component of the local habitat network and green infrastructure. Field surveys have confirmed that these habitats support, or are likely to support, a range of species, including nesting birds and foraging/commuting bats.

2.9. Two small areas of broad-leaved woodland are present within the western edge of the Site alongside Oxford Road, and there are sparsely scattered hedgerow trees.

Aspects to be considered in the scheme design and environmental assessment

2.10. Aspects of the Site and adjacent areas to be considered in the design and assessment of the proposals are identified as:

- Surface water drainage;
- Oxford Road and existing access to properties;
- Public Rights of Way (BR 229/9/30 & FP 229/8/10);
- Trees / hedgerows;
- Heritage assets;
- Adjacent uses – Oxford Parkway Station and Water Eaton Park & Ride; residential, and recreation.
- Land west of Oxford Road - CDC Local Plan Allocation PR6b.

3. The Proposed Development

3.1. The Applicants are proposing the development of at least 690 dwellings, a two form-entry primary school, a local centre, associated infrastructure including public open space, drainage and engineering works. Approval of full details will be sought for access from Oxford Road, with all other matters reserved for subsequent approval.

3.2. At this stage, whilst aspects of the proposal are evolving, the key elements to be considered are:

- Approximately 690-800 dwellings;
- A primary school;
- A local centre;
- Formal and informal open space in accordance with standards;
- Sustainable drainage;
- Footpaths and cycle links, with vehicle, pedestrian and cycle access from Oxford Road.

Mitigation as part of the proposal

3.3. Inherent mitigation designed into the scheme to avoid what might otherwise be significant effects will be formulated using the advice of the assessment team.

3.4. In terms of scale, it is envisaged, subject to detailed assessment, that the majority of the residential buildings will range in height between 2 and 4 storeys but in some key locations may extend up to 5 storeys. Built heights for the purpose of the assessment do not include point features such as chimneys, and will be defined from existing ground level, subject to a vertical tolerance. An area to be reserved for the provision of a primary school, in accordance with policy.

Site topography

3.5. There will be localised areas where material is to be removed / added to provide development platforms. An allowance for this will be noted on the Building Heights parameter plan. The methodology for re-profiling will comprise excavation of the relevant area using a mechanical excavator with grading bucket. Infilling will take place up to the

required level, utilising the larger material for the deepest areas of infilling and the smallest material for the near surface level.

3.6. Where additional infill material is required, this will be sourced from graded site-won material taken from the removal of the undulations as part of the levelling work. If further material is required, it will conform to specifications to control the size of the material and its properties.

Drainage

3.7. Generally, the topography of the Site falls to the north and east. Existing ditches associated with field boundaries convey surface water off-site and towards the River Cherwell. It is anticipated that attenuated surface water run-off will be released into the existing drainage system. It is not anticipated that significant land forming is required for drainage purposes.

Heritage

3.8. The masterplanning of the Site will take into account the barrow monuments.

Public Rights of Way

3.9. The two public rights of way that cross the Site will be accommodated within the layout of the residential development.

Phasing

3.10. It is anticipated that the site preparation and infrastructure provision will commence in 2023/24, with development progressing through to 2027/28.

MITIGATION AND CONTROLS

Control of construction activities

3.11. The assessment of effects prior to the adoption of additional mitigation measures will assume that construction will proceed in accordance with industry standard best practice techniques and that all legislative requirements will be met. Standard measures can be secured through planning conditions and will therefore not be repeated as mitigation in the ES. These include: site waste management; construction and environment management; construction traffic management.

Procedure for dealing with contaminated material

3.12. Historically the Site has been used for agriculture, which has a low to medium risk associated with the potential for contamination. In the event that contaminated material is identified during site preparation, the contractor would follow standard procedures to:

- notify the Environmental Health department of the discovery.
- secure the area / take action to prevent the release of contamination.
- appoint a specialist to carry out the necessary analysis to identify the substance and appropriate containment/disposal options.
- dispose of the material in accordance with applicable legislation after obtaining the necessary consents and / or licenses.
- record waste transfer / disposal certificates.

4. Approach to assessment

THE PROPOSED EIA

4.1. EIA is a process through which the likely significant environmental effects of a development proposal can be identified and, where possible, adverse effects avoided or mitigated. This process is reported in an ES, which is submitted with a planning application.

4.2. The Applicants consider the Proposed Development is EIA development requiring EIA to be undertaken. This Section of the Scoping Report sets out the scope of the proposed EIA and identifies the proposed structure for the chapters of the ES. The ES will consider various environmental parameters as required by Schedule 4 of the EIA Regulations.

4.3. Environmental Statements are required to identify those aspects of the environment likely to be 'significantly affected' both directly and indirectly by the development proposed. An ES should then describe the nature of those significant effects taking account of the magnitude of the impact and sensitivity of the receptor. These assessments will identify mitigation where appropriate and evaluate residual effects with this in place.

4.4. The environmental effects of the Proposed Development will be considered during both the construction and operational phases. The findings of the EIA will be presented in a main written statement, supported by figures and appendices. A non-technical summary of the ES will be provided as a separate document.

Assessment of effects at the outline planning stage

4.5. An appropriate way to link an outline planning permission to proposals that have been subject to EIA is through a set of development parameter plans that are included as part of the formal planning application. Parameter plans define the development 'envelope' and assumptions that are subject to EIA, and upon which the planning decision is based. This approach ensures that sufficient information to identify, predict and assess the significance of the main environmental impacts is available at the initial outline planning permission stage.

4.6. It is proposed that the following parameter plans will be submitted with the planning application:

- Land use plan and the range of building heights;
- Access and movement plan, defining new vehicular junctions, primary circulation routes and pedestrian and cycle links; and
- Green infrastructure plan.

Study area and temporal scope

4.7. Each assessment topic will define its study area geographically and indicate the timescales over which the environmental effects will be considered. The temporal scope will consider the construction phase, and thereafter when the development is completed and occupied (often referred to as the 'operational' phase). For example, the assessment of landscape and visual assessment will consider residual effects at a future time when the landscaping within the scheme has had a period of 15 years to mature.

4.8. It is envisaged that construction will commence in 2023/24. The proposed development is designed as a permanent provision, i.e., decommissioning is not an aspect that will be considered in the EIA.

Technical scope

4.9. In order to determine the likely scope of the EIA, the process has identified:

- the key characteristics of the Site and the establishment of the environmental baseline through a series of desk and field studies;

- gaps in the baseline and the further survey work required to address this;
- initial consideration of the potential sources and nature of environmental impacts; and
- definition of the assessment methodologies to be used in each study area (where available).

4.10. A series of baseline studies have been undertaken to establish the baseline environment for this Scoping Report. Where necessary, studies are ongoing or are being undertaken and can be tailored to advice offered in response to this scoping request. The baseline and assessment work undertaken as part of preparing this Scoping Report is set out within the following Sections.

4.11. In Schedule 4, Paragraph 4 of the EIA Regulations require an ES to provide *"A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydro morphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape."*

4.12. As part of the EIA scoping process, issues within the topic areas above that are identified as unlikely to give rise to significant environmental effects can be omitted ('scoped out') from the EIA and, where justified, it is reasonable to propose a reduced scope of topic areas where initial assessment clearly indicates significant effects are unlikely.

Pre-application consultation

4.13. Further to this EIA scoping exercise, ongoing consultation with statutory consultees and officers of the Council will continue as necessary to confirm the detailed methodology for specific assessments. Each topic-based EIA chapter will reference the supporting consultations that were undertaken with expert stakeholders on the methodology employed.

4.14. Alongside this, the Applicants will undertake effective pre-application consultation with the Council, consultees and other stakeholders, including the public. Details of this and its timing will be discussed with the Council to agree a suitable approach to consultation that accords with Government advice regarding covid-19 in effect at the relevant time.

ASSESSMENT METHODOLOGY

4.15. The ES will include the assessment methodology used for the specific assessment topic, using relevant guidance where this is in place, and wherever possible, predict environmental effects in a standard framework.

4.16. Each ES chapter will identify those receptors relevant to the topic and they will be assessed to determine their sensitivity to change as a result of the project from the known baseline. The receptors will be attributed a sensitivity level ranging from high to low as set out in the Table below.

Sensitivity of a generic environmental receptor to change

Sensitivity	Receptor type
High	Receptors of high importance with a high susceptibility to change and limited potential for substitution or replacement.
Medium	Receptors with some sensitivity to change and medium importance. Often have relevance at a regional scale with some opportunity for substitution or replacement.
Low	Receptors with low importance and sensitivity to change, often of relevance at a local scale.
Negligible	The receptor has very low importance / is not sensitive to change.

4.17. The magnitude of impact affecting each receptor will then be considered. This can be positive or negative as well as temporary or permanent. The nature of each will be analysed based on quantitative and qualitative techniques and a magnitude assigned ranging from no/negligible change to major change, as set out below.

Criteria for the magnitude of environmental impact

Magnitude	Description of criteria
Negligible	Very minor changes that are not noteworthy or material.
Minor	Some measurable changes that are noteworthy and material. Minor benefit or minor loss/detrimental change to the receptors characteristics, features or elements.
Moderate	Adverse loss of resource or damage to characteristics, features or elements but limited impact on integrity; or Benefit or addition to characteristics, features and elements that improve the receptor.
Major	Effects will be of a consistently high magnitude and frequency and cause severe damage to key characteristics, features and elements or even total loss; or Major improvement to characteristics, features and elements of receptor.

4.18. Having identified the sensitivity of the receptor and the magnitude of the impact, the standard matrix set out below will be used to indicate the predicted level of effect, ranging from neutral to substantial. For the purposes of the ES, unless specifically defined otherwise in an ES chapter, effects of moderate and higher are considered to be significant effects.

Framework for identifying environmental effects

Receptor sensitivity	Magnitude of impact			
	Negligible	**Minor**	**Moderate**	**Major**
Negligible	Neutral	Neutral	Minor/neutral	Minor
Low	Neutral	Minor	Moderate	Moderate/Major
Medium	Neutral	Moderate	Moderate/Major	Major
High	Neutral	Moderate/Major	Major	Substantial

4.19. Whilst the levels of effect will be defined within each chapter of the ES, the general definitions shown below can be used for topics where specific EIA guidance is not available.

Broad Definition of Effect

Effect	Definition
Substantial	A key factor in the decision-making process. Generally, but not exclusively associated with features of national importance which cannot be replaced or relocated.
Major	Likely to be important considerations at a regional or district scale but, if adverse, are potential concerns, depending upon the relative importance attached to the issue.
Moderate	Important at a local scale, but are not likely to be key decision making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
Minor	Effects concerning local issues that are of relevance at the detailed design stage.
Neutral	Effects which are not perceptible, or within normal bounds of variation or forecasting.

4.20. The likely effects of the Proposed Development will be described as:

- Adverse / beneficial;
- Direct / indirect;
- Temporary / permanent;
- Reversible / irreversible.

Baseline assessment

4.21. Each topic-based chapters of the ES will identify the current baseline scenario, and where relevant the future scenario, against which the environmental effects of the Proposed Development will be measured. The baseline assessment will involve describing the current state and circumstances of the identified receptors and changes that might be expected to occur as a result of the Proposed Development.

Assessment of environmental effects

4.22. Having identified receptors that are likely be affected (taking into account inherent mitigation), the assessments will outline the potential impacts that could arise in the absence of any additional mitigation. Where adverse effects are identified, the ES will set out the mitigation measures considered necessary to minimise the potential effect. Residual effects will be evaluated and their significance will be reported based upon the magnitude of impact against the sensitivity of the receptor.

Assumptions and limitations

4.23. In the preparation of the ES, it is assumed that all legislative requirements will be met and the proposed development will be constructed in accordance with industry standard techniques and best practice methods implemented on-site. It is therefore not necessary to re-consider this as mitigation that will be evaluated in the assessment of residual effects. Further details are set out in the following Sections.

Assessment of cumulative effects

4.24. The requirement for cumulative effects assessment is set out in Schedule 4 of the EIA Regulations. At Schedule 4(5), the EIA Regulations require *'A description of the likely significant effects of the development on the environment resulting from, inter alia: …(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;*

4.25. Cumulative impact comprises the combined effects of the Proposed Development with other existing and/or approved development. It is proposed that the EIA will consider other planning permissions that are not yet constructed or operational (PPG Reference ID 4-024-20170728), along with allocated schemes where there is a

reasonable degree of certainty that they will proceed within 3 years (PPG Reference ID: 42-014-20140306).

4.26. This EIA scoping considers the potential for cumulative effects when the construction and operational phases could be concurrent, and where there are sensitive receptors common to other developments. Identified cumulative developments that will be assessed in relation to the Proposed Development are:

- CDC Local Plan Site Allocation PR6b, west of Oxford Road, 670 new homes and
- Oxford City Council Local Plan Allocation SP24 – at least 125 new homes.

Greenhouse gas emissions and climate change

4.27. Climate change is identified as one of the defining environmental policy drivers, and the greenhouse gas emissions from all projects can contribute to climate change, or potentially deliver reductions. It is vital to ensure that all future development is resilient to the potential effects of climate change and that proposals do not exacerbate the effects of climate change affecting humans or natural systems.

4.28. IEMA has published an 'EIA Guide to Climate Change Resilience and Adaptation' (November 2015) which provides a framework for the effective consideration of climate change resilience and adaption in the EIA process. This guidance states that the scoping of a project, taking into account climate change, should focus on general considerations rather than detailed, quantitative analysis. This is because EIAs consider proposals for specific sites, whereas climate change models are prepared at a regional or national-level model. The UK has legally binding GHG reduction targets which are set at a macro level, with Government having set ambitious targets to move to a low carbon economy through a range of mechanisms, including decarbonising energy generation, road transport, buildings and food production.

4.29. It is proposed that specific climate change considerations will be covered to the extent it is relevant in each topic chapter, such as transport, air quality, noise, water resources, biodiversity and landscape. The impact of climate change on the development will be considered using the UKCP18 climate change projections for a medium emissions scenario for projected global mean warming of +2°C above pre-industrial levels. This will be a high-level assessment of how potential climate change may alter the predicted effects. It is not considered likely that completely new direct impacts will arise as a result of climate change, but the scale of potential impacts might change when considered against the future baseline conditions.

5. Effects considered to be insignificant

5.1. As part of the EIA scoping process, issues that are identified as unlikely to give rise to significant environmental effects can be covered in a reduced scope of study, or scoped out of the assessment. This section of the report identifies the topic areas proposed to be scoped out from the EIA or explains for which aspects a reduced scope is considered appropriate.

Human health

5.2. The subject of human health is addressed in a number of the proposed topic areas. Protection of human health will be considered within the assessments of transport and traffic, air quality, noise and vibration, in relation to relevant published standards and thresholds.

5.3. The assessment will consider the potential indirect contribution towards health improvement through access to housing, community facilities including education, recreation/physical activity, the ability to utilise sustainable transport (minimising individual car use), and securing the benefits from the economic investment. It will be attentive to the potential determinants of health, and consistency with local plan policy. It is not proposed that the ES will contain a specific chapter for human health.

Material assets

5.4. There is mains electricity, potable water, telecommunications, and foul and surface water drainage services on site and nearby. An overhead electricity line crosses the northern corner of the Site. Whilst upgraded services and provision across the Site will be needed, it is not envisaged that the construction will have any significant effects on material assets.

Accidents and disasters

5.5. The potential for accidents or disasters resulting from the occupation and use of the proposed development is considered to be negligible. This judgement is based on the following information.

5.6. Potential emergency situations are considered by the Thames Valley Local Resilience Forum and published in their community risk register. The register focuses on nine categories of serious risk that are most likely and could result in an emergency. These are considered below in relation to the preparation of the EIA.

5.7. The proposed development is not considered specifically vulnerable to five of the identified risks: influenza disease, animal disease, loss of critical infrastructure, industrial accidents and fuel shortages. There are no expected significant effects in relation to these and they will not need to be considered in the EIA. The other four risks are considered in turn.

5.8. RIVER FLOODING – Whilst the Site is in an area that is at a low risk from flooding, a flood risk assessment is required for the proposal as it covers an area of more than 1 hectare. A drainage strategy will be prepared to demonstrate that the development will not result in flooding on the Site or elsewhere down river.

5.9. SEVERE WEATHER - Resilience of the proposals to future climate change impacts will be reported in the description of the proposal. Specific matters such as wind loading for the building designs will be dealt with under the building regulations and the detail will not be available at the planning submission stage.

5.10. ENVIRONMENTAL POLLUTION – The land has been used for agriculture, and the drainage of surface water from the Site has the potential to lead to pollution. This will be considered in the assessment in relation to the River Cherwell and wildlife receptors.

5.11. TRANSPORT ACCIDENTS – The proposal will deliver new junctions on a section of Oxford Road and roads

within the development. These will be designed to approved highway standards and subject to appropriate speed limits. There are no expected significant effects in relation to these. A transport assessment will accompany the planning application. The baseline transport information in the EIA will refer the road traffic accident history reported in the TA.

5.12. The potential extent of a reservoir breach has been considered with reference to the flood risk information published by the Environment Agency. Water from a breach of the Farmoor Reservoir (7km south west) follows the course of the River Thames and would not affect the application Site.

5.13. It is not considered that major accidents or disaster during construction are likely but the aspects above will be kept under review. Upon completion the potential for accidents or disasters affecting the development and resulting in adverse effects on human health, cultural heritage or the environment is considered to be negligible. It is not proposed that the ES will contain a specific assessment of potential accidents and disasters but the aspects above will be considered for the development under 'normal' conditions.

5.14. Oxfordshire Emergency Planning Unit also considers specific sites in Oxfordshire in relation to the potential for radiation incidents at Culham or Harwell Science Centres to affect members of the public. There is very low likelihood (one in one billion years) of an off-site radiation emergency at Culham, and it is expected that decommissioning of the Harwell reactors will be complete by 2025.

5.15. It is not proposed that the ES will contain a specific assessment of potential accidents and disasters.

Waste

5.16. The Council provides for the sustainable management of household waste. In relation to the future capacity to deal with waste, this includes planned housing and population growth. As the Site is allocated for housing development in the Local Plan, the needs of its future residents for waste collection, recycling and disposal are taken into account by waste management planning.

5.17. The development, predominantly on a greenfield site, will not generate any unusual or complex waste requiring specialist control or management and will therefore be unlikely to result in significant adverse effects to the environment. The issue of waste disposal is not considered likely to result in significant effects and it is not proposed that the ES will contain a specific chapter for waste.

5.18. An estimate of quantities and types of waste produced during the construction and operation phases will be included in the ES as required by EIA Schedule 4, 1.(d). This will be estimated using the Building Research Establishment SmartWaste Database. This provides a benchmark from which waste reduction measures can be appraised.

Soils and agricultural land

5.19. A site survey of agricultural quality has been undertaken, as shown in Appendix 2: Section 17. This classified 38.5ha as being Grade 3b, 4ha as Grade 3a, 3ha as Grade 2 and 1.5ha as being non-agricultural. A small area of the Site (c.0.6ha) on the north east boundary was not included in the survey. The adjacent surveyed land is categorised as Grade 3b and it is considered that the area not surveyed is very likely to be Grade 3b also. A section of the eastern field identified within the local plan allocation as retained agricultural land, is not included in the application Site.

5.20. Across the 47.6ha Site, some 7ha is categorised best and most versatile land (BMV). Given the limited extent of BMV that would be removed from production, and that the Site is allocated for housing development in the Local

Plan, Article 16 of the Town and Country Planning (Development Management Procedure)(England) Order 2010[1] does not apply to this proposal.

5.21. The primary measures to mitigate the impacts on soil resources during the site preparation, earthworks and construction activities will be to store and re-use surplus soils in a sustainable manner (for an after-use appropriate to the soil's quality) in accordance with Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. This approach will ensure that the quality of soils retained on-site and exported off-site (if required) is maintained by good soil handling and storage, particularly to avoid compaction and biodegradation of soils that are in storage.

5.22. It is not considered that there would be any significant effect on soils or agricultural land resources. It is not proposed that the ES will contain a detailed assessment of soil and agricultural land.

Ground conditions

5.23. A Phase 1 study has been prepared and used to conduct a preliminary Conceptual Site Model (CSM) of the potential level of risk posed to human health or controlled waters associated with the development of the Site. The assessment of contamination risk is based on the source-pathway-receptor concept, i.e., if one of these elements is absent, no significant risk is considered to be present.

5.24. The CSM shows that the overall risk to the health of construction workers and future residents is “Very Low”, and “Low” with respect to use of the land for agriculture. A “Medium” level risk is identified to surface water, attributed to the historical agricultural uses.

5.25. The Site and surroundings are located within a surface water Nitrate Vulnerable Zone (Cherwell (Ray to Thames) and Woodeaton Brook, Thames (Leach to Evenlode)), and within a Drinking Water Safeguard Zone, but not within a Drinking Water Protected Area. It is considered that the development proposed will reduce pollution risk by replacing the current agricultural use, which is a more significant source of nutrient input to surface waters.

5.26. Based on this information, it is considered that there is no potential for significant effects related to ground conditions during development of the Site, or that is likely to affect residents in the completed scheme. It is proposed that the assessment of ground conditions/ contamination is scoped out of the ES.

5.27. The following sections outline the proposed scope of the assessment under each topic heading.

[1] The Order requires local planning authorities consult DEFRA on proposals that are (1) not in accordance with a development plan, and (2) would result in the loss of 20ha or more of best and most versatile land currently used for agriculture

6. Traffic, transport and movement

INTRODUCTION

6.1. This section describes the scope and methodology proposed for the assessment of traffic and transport. It describes the existing baseline and summarises the potential impacts that could arise as a result of the construction and operation of the proposed scheme. Where necessary, it summarises additional survey work required to enable potential impacts to be identified. The planning application will be supported by a Transport Assessment (TA) and Travel Plan (TP).

PROPOSED METHODOLOGY

6.2. The traffic and transport impact of the proposed development will be assessed in line with guidance contained within National Planning Policy Guidance, the DfT publication 'Guidance on Transport Assessment' (March 2007) and the Institute of Environmental Assessment (now IEMA) 'Guidelines for the Environmental Assessment of Road Traffic'.

6.3. As recommended by the IEMA guidelines, the following environmental effects will be considered when considering traffic as a result of the proposed development: Severance; Driver Delay; Pedestrian Delay; Pedestrian Amenity; Fear and Intimidation; and Accidents and Safety.

6.4. The extent of the transport impact will be determined using the pre-defined significance criteria outlined within the IEMA guidance, based on the net change in journeys as a result of the proposed development. The significance criteria will establish the scale of any beneficial or adverse effects that the development will have on the transport network.

EXISTING BASELINE

6.5. The Site is bounded by the A4165 (Oxford Road) to the west, Oxford Parkway Park and Ride to the north, Cutteslowe to the south and agricultural land to the east. Two tracks provide access to Water Eaton and the surrounding farms and St Frideswide Farm which borders the Site.

Local Highway Network

6.6. Oxford Road is a two-way single carriageway road, with a southbound bus lane, and shared cycling/pedestrian facilities on both sides of the carriageway. It is lit and is subject to a 40mph speed limit in the vicinity of the Site. This section of Oxford Road connects the A4260 and Bicester Road with the A40 to the south. From the Wolvercote Roundabout junction on the A40, the A44 links with the A34.

6.7. The A34 trunk road forms part of the strategic road network. It connects the M3 in Hampshire with the M40 to the north. The A34 can be accessed from the application Site via Oxford Road and either the A4260 and A44 (north from the Site), or via the A40 and A44 (south from the Site).

Pedestrian/cycle Facilities

6.8. Oxford Road benefits from continuous shared footway/cycleways on both sides of the carriageway. This network allows for unimpeded pedestrian and cyclist movements to the north for Oxford Parkway Station and Water Eaton Park and Ride, and to the south, connections to local residential hubs as well as Oxford City Centre.

6.9. The existing dedicated cycle infrastructure in the vicinity of the Site is good. The National Cycle Network (NCN) and local cycle network comprise on and off-road routes, signed cycle routes, and shared use routes of which directly pass the Site.

6.10. NCN route 51 runs alongside the eastern side of Oxford Road, and its full length links Oxfordshire,

Buckinghamshire, Bedfordshire, Cambridgeshire, Suffolk and Essex. Of specific relevance to the proposed Site, this route links to the Site to Oxford Parkway and Oxford City Centre.

Public Rights of Way

6.11. The Site is crossed by two Public Rights of Way. PRoW 229/9/30 is a bridle path that runs from Oxford Road across to the east, and PRoW 229/8/10 is a footpath that crosses the southern part of the Site. Both paths lead towards Water Eaton, approximately 1.2 km north-east of the Site. On the western side of Oxford Road, footpath 229/10/30 crosses North Oxford golf course to a footbridge over the railway.

Public Transport

6.12. There are good public transport linkages from the Site via bus and train with regular services to Woodstock, Gosford, Kidlington, Bicester and Oxford City by bus and to Oxford, London, and Cardiff Central by train.

BASELINE TRAFFIC DATA

6.13. Traffic data will be required to conduct traffic impact modelling for the area, which is to include Oxford Road, the A40 Cutteslowe, southern Kidlington and potentially junctions onto the A34. Scoping with Oxford County Council and Highways England for the Transport Assessment will confirm an agreed approach for the surveying/modelling of the strategic/local transport study area.

POTENTIAL EFFECTS

6.14. The following traffic and transport effects identified for inclusion within the assessment include:

- Net change in vehicular traffic patterns;
- AM and PM peak hour junction capacity;
- Local footway provision;
- Local cycle facility provision; and
- Effect on personal injury collisions.

PROPOSED MITIGATION AND MONITORING

6.15. Consideration will be given to the promotion of a number of mitigation measures. At this stage, the measures to be included as part of the assessment are, but not limited to, the following:

- The development of the site access points;
- The implementation of a Public Transport Strategy;
- The implementation of a Pedestrian/Cycle Strategy;
- The implementation of a Travel Plan.

6.16. Any additional mitigation measures required following detailed capacity assessments will be discussed with the highway authority and Highways England as necessary.

7. Air Quality

7.1. The proposed development will require site preparation and construction works, and will generate additional traffic on the local road network. Therefore, there is the potential for significant air quality effects to occur, and the Environmental Statement will include an assessment of air quality effects. It is proposed to address the following key effects:

- the impacts of dust soiling and concentrations of PM_{10} during the construction period;
- the impacts of emissions from road traffic generated by the development on concentrations of nitrogen dioxide, PM_{10} and $PM_{2.5}$ at sensitive locations along the local road network during both construction and operation;
- the impacts of emissions from traffic on the roads adjacent to the proposed development on the air quality conditions that future residents will experience; and
- whether any additional mitigation measures will be required to address any significant air quality effects.

7.2. Air quality is predicted to improve progressively, owing to lower emissions from road vehicles and heating systems as lower emission technologies become used. Whilst the assessment will focus on the near-term (year of operation), the outlook for the longer term is one of improvement, both in terms of local and regional air quality, but also in terms of emissions associated with the proposed development itself.

7.3. Climate change is a long-term effect, and significant changes in climate are not expected by the completion year. Climate change will, therefore, not affect air quality model predictions set out in the ES. In the longer term (2050 – 2080) changes in climate might affect heating and cooling requirements, and therefore have an influence on the emissions associated with the Proposed Development. However, significant effects are not expected as a result. These impacts will therefore not be considered in detail in the air quality section of the EIA.

BASELINE CONDITIONS

7.4. Cherwell District Council has declared an Air Quality Management Area (AQMA) as a result of exceedances of the annual mean nitrogen dioxide objective some 2km north of the Site. AQMA3 incorporates a section of Bicester Road on the eastern side of Kidlington.

7.5. Oxford City Council has declared an (AQMA) across its entire administrative area. The AQMA has been declared as a result of exceedances of the annual mean nitrogen dioxide objective. Nearby junctions such as Cutteslowe Roundabout and Wolvercote Roundabout are subject to air quality monitoring by OCC (diffusion tube locations). In terms of PM_{10}, Oxford City Council concluded that there are exceedances of the objectives. It is, therefore, reasonable to assume that existing PM_{10} levels may exceed the objectives within the study area.

7.6. As of 2020, monitoring carried out by Oxford City Council indicates that roadside annual mean nitrogen dioxide concentrations at relevant locations exceed the objective level of 40µg/m^3. The City Council's Air Quality Action Plan 2021 has the key objective to bring levels of NO_2 into legal compliance as soon as possible, with a target to achieve a local annual mean concentration of 30µg/m^3 NO_2 by 2025.

STUDY AREA

7.7. The study area for the assessment of road traffic impacts will be defined following receipt of the traffic data. It will include all roads with relevant exposure where the predicted changes in AADT flow exceed the screening criteria published by EPUK/IAQM in the document Land-use Planning and Development Control: Planning for Air Quality v1.2[2].

[2] Moorcroft and Barrowcliffe *et al* (2017). Land-use Planning and Development Control: Planning for Air Quality v1.2.

7.8. For the assessment of construction phase impacts, receptors within 350m of the Site boundary, and 50m beyond each side of Oxford Road for a distance of 500m north and south of the Site entrance/s will be considered[3].

POLICY AND GUIDANCE

7.9. A summary of all relevant national and local policy and guidance will be provided. The assessment will be carried out with reference to the guidance prepared by the IAQM.

ASSESSMENT SCENARIOS

7.10. The assessment of the air quality impacts of changes in road traffic will consider the same scenarios as the Transport Assessment. Where traffic data is provided based on completion of a phase in a specific year, the vehicle emission factors for the opening year of that phase will be used to ensure that a worst-case assessment is carried out (as air quality is predicted to improve going forward).

CONSTRUCTION ASSESSMENT

7.11. The assessment methodology will follow that set out in the IAQM Guidance on the Assessment of Dust from Demolition and Construction[4]. It will identify the potential for dust to be generated and the sensitivity of the surrounding area and will combine these to determine the risk of dust impacts without any mitigation. This information will then be used to determine the appropriate level of mitigation required to ensure that there are no significant effects.

7.12. If the construction works are anticipated to generate a volume of traffic on the local roads that exceed EPUK/IAQM screening criteria, then road traffic emissions dispersion modelling will also be undertaken to determine the impacts of the construction traffic in the first full year of the construction works.

OPERATIONAL DEVELOPMENT ASSESSMENT

7.13. The incremental change to traffic flows will initially be screened against the criteria set out in the EPUK/IAQM guidance document on Planning for Air Quality. Where necessary, roadside pollutant concentrations, and the impacts of the development-generated traffic will be predicted using the ADMS-Roads dispersion model. The model will be verified against local monitoring data.

7.14. Impacts will be predicted at a number of locations both within, and close to, the proposed development. Receptors will be selected to represent the potential worst-case exposure. For new dwellings within the development, these will be at the façades of the properties nearest Oxford Road. For existing properties, these will be at the roadside façade of properties along the local road network where the development-generated traffic increases will be greatest, and at locations where concentrations are expected to be highest, such as near to junctions.

7.15. It is not considered that any designated ecological sites will be affected by increased road traffic emissions generated by the proposed development. This will be kept under review in relation to Natural England's published guidance[5] as their selection will depend upon the changes in traffic flows predicted in the traffic data upon which the assessment will be based, which are not yet available.

7.16. The model will be used to predict baseline pollutant concentrations and the likely concentrations in the year of first occupation of homes within the development, without and with the development.

ASSESSMENT THRESHOLDS / MAGNITUDE OF EFFECT

[3] Holman *et al* (2014) IAQM Guidance on the Assessment of Dust from Demolition and Construction v1.1

[4] ibid

[5] Natural England (2018) Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001) Available: http://publications.naturalengland.org.uk/publication/4720542048845824

7.17. The descriptions of impacts at individual receptor locations will take into account both absolute concentrations and the predicted change, in accordance with EPUK/IAQM Guidance.

SIGNIFICANCE OF RESIDUAL EFFECTS

7.18. The IAQM Guidance advises that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. The assessment will thus focus on determining the appropriate level of mitigation to be applied so as to ensure that effects will normally be 'not significant'.

7.19. Once operational, the key air quality effects of the proposed development are expected to be related to road traffic emissions. For new receptors within the proposed development, predicted concentrations will be compared with the relevant air quality objectives, and any exceedances will be deemed a significant adverse effect, without mitigation. For any such locations, an appropriate scheme of mitigation will be identified to ensure that future residents experience acceptable air quality and no significant residual effects remain.

7.20. Predicted concentrations at existing nearby sensitive receptors will be compared with the relevant air quality objectives and the significance of impacts at individual receptors will be determined using the EPUK/IAQM Guidance on Planning for Air Quality. The overall significance of the air quality effects will also be determined. If necessary, appropriate mitigation measures will be recommended to ensure that there are no significant effects.

8. Noise and vibration

8.1. The noise and vibration assessment will consider the likely significant effects associated with the Proposed Development on:

- Residential receptors – existing and proposed dwellings; and
- Non-residential noise sensitive receptors - including community, educational and healthcare facilities, places of worship, offices and other commercial facilities.

8.2. The assessment will consider the likelihood of potential significant effects from the following sources:

- Transport noise from road and rail traffic;
- Sound associated with Oxford Parkway Railway Station and Water Eaton Park & Ride;
- Sound associated with aggregates distribution at Kidlington Rail Depot;
- Construction noise;
- Construction vibration.

8.3. Changes in road traffic noise levels from existing roads as a result of development generated traffic will be predicted. It is not considered that vibration effects from the proposed residential uses would result in significant effects and therefore it is proposed to scope this aspect out of the assessment:

BASELINE

8.4. Existing residential receptors in close proximity to the Site are located on Oxford Road (Pipal Cottage), Jordan Hill and Banbury Road, as well as St Frideswide Farm to the east of the Site. Other nearby uses include Cutteslowe Park to the south of the Site, and to the west of Oxford Road, North Oxford Golf Club, offices at Jordan Hill Business Park, and Wolvercote cemetery. None of these are considered to be potentially sensitive receptors of noise from the Proposed Development.

8.5. The establishment of baseline conditions will be informed from noise monitoring undertaken within the vicinity of the Site between the 18th and 20th March 2020, along with baseline road traffic data that will be provided. For clarity, the noise monitoring on-site was undertaken before the Covid-19 Lockdown measures commenced in 2020

and is therefore representative of normal conditions.

STUDY AREA

8.6. The likely spatial extents of study for the noise and vibration assessment are provided below. In some instances, it may be necessary to increase the extent should it be determined that likely significant effects may occur outside of these areas. The likely spatial extents of the study area are:

- 300m: noise from construction activities, such as material movements, earthworks, ground improvement and piling, crushing and breaking;
- 100m: ground-borne vibration from high energy construction activities, including impact piling works;
- 1 dB change: the area within which road traffic noise from construction or operational vehicle movements to and from the construction site are likely to result in a change of 1 dB $L_{A10,18hr}$ or greater.

POLICY AND GUIDANCE

8.7. A summary of all relevant national and local policy and guidance is shown below. Any local policies or guidance (e.g. Supplementary Planning Guidance (SPG)) relating to noise and vibration will also be considered. The definition of appropriate assessment criteria and noise metrics for the purpose of identifying likely significant effects will take into account the relevant national policies, standards and guidance.

8.8. It is anticipated that the following guidance will be used in the assessment:

- National Planning Practice Guidance;
- BS8233:2014 'Guidance on sound insulation and noise reduction for buildings';
- BS4142:2014 'Methods for rating and assessing industrial and commercial sound';
- World Health Organisation (1999 'Guidelines for Community Noise';
- BS5228-1: 2009+A1 2014: 'Code of practice for noise and vibration control on construction and open sites. Part 1: Noise';
- BS5228-2: 2009+A1 2014: 'Code of practice for noise and vibration control on construction and open sites. Part 2: Vibration';
- Design Manual for Roads and Bridges (DMRB);
- ProPG: Planning & Noise (2017) 'New Residential Development;
- Building Bulletin 93:2015 Acoustic design of schools: performance standards;
- Health Technical Memorandum 08-01: Acoustics (2013); and
- BS6472-1:2008 'Guide to evaluation of human exposure to vibration in buildings. Part 1: Vibration sources other than blasting'.

ASSESSMENT SCENARIOS

8.9. The assessment of the noise effects due to changes in operational road traffic will likely consider the existing baseline, the opening year of the Proposed Development, and a future assessment year (typically opening year +15 years).

CONSTRUCTION ASSESSMENT

8.10. Construction noise predictions will be carried out in accordance with guidance contained in BS 5228-1:2009+A1:2014[6], which will also be used to inform assessment criterion.

8.11. The consideration of construction ground-borne vibration effects, such as those associated with high-impact

[6] British Standards Institute. BS 5228:2009+A1:2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' Part 1: Noise, 2014

activities, shall be considered using criteria advocated in BS 5228-2:2009+A1:2014[7], and other vibration related standards and guidance[8] [9].

8.12. The calculation and measurement of road traffic flows for the purpose of informing the construction noise assessment will use the procedures described in the Department of Transport's 'Calculation of Road Traffic Noise'[10] (CRTN, 1988), and assessment criterion informed by Highways England '*LA 111 Noise and vibration*' (LA111, 2020)[11]. Noise modelling will be used to assess changes in road traffic noise and the significance of effects will be determined based on change and absolute level of noise exposure using a policy-led approach.

OPERATIONAL DEVELOPMENT ASSESSMENT

8.13. The potential effects of noise from fixed and mobile plant associated with the Proposed Development will be considered in accordance with BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' (BS 4142, 2019)[12].

8.14. Noise associated with changes in road traffic noise due to changes to the future operational traffic flows will be calculated in line with guidance presented in CRTN (1988) and assessed in accordance with the assessment criterion provided by Highways England '*LA 111 Noise and vibration*' (LA111, 2020). This will include consideration of potential cumulative effects with other development schemes where traffic data is available for the future assessment years.

ASSESSMENT THRESHOLDS / MAGNITUDE OF EFFECT

8.15. The assessments will be undertaken in line with the Noise Policy Statement for England (NPSE, 2010), taking into account relevant policies, standards and guidance. Criteria will be developed to determine significance based on both absolute levels of noise and changes in noise exposure with respect to relevant policy thresholds and guidance. A summary of the proposed thresholds of potential effect is shown overleaf.

Thresholds of Potential Effect Criteria (outdoor, free-field noise levels unless otherwise stated)

Noise Source	Period	LOAEL	SOAEL	UAEL
Construction Noise and Vibration	Daytime	65 dB $L_{Aeq,12hr}$	75 dB $L_{Aeq,12hr}$	85 dB $L_{Aeq,12hr}$
	Evening	55 dB $L_{Aeq,4hr}$	65 dB $L_{Aeq,4hr}$	75 dB $L_{Aeq,4hr}$
	Night	45 dB $L_{Aeq,8hr}$	55 dB $L_{Aeq,8hr}$	65 dB $L_{Aeq,8hr}$
Operational Fixed Plant	All	Effect criteria set in relation to BS 4142:2019 requirements		
Operational Road Traffic	Daytime	55 dB $L_{A10,18hr\ (façade)}$	68 dB $L_{A10,18hr\ (façade)}$	71 dB $L_{Aeq,16hr}$
	Night	40 dB $L_{night,\ outside}$	55 dB $L_{night,\ outside}$	66 dB $L_{Aeq,8hr}$

8.16. Where development related noise exposures are shown to be lower than the Lowest Observed Adverse Effect Level (LOAEL) values shown above, a significant effect in terms of the EIA Regulations will not be deemed to occur at residential receptors.

[7] British Standards Institute. BS 5228:2009+A1:2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' Part 2: Vibration, 2014

[8] British Standards Institute. BS 6472-1:2008 Guide to Evaluation of Human Exposure to Vibration in Buildings: Vibration Sources Other than Blasting, 2008

[9] British Standards Institute. BS 7385-2: 1993 Evaluation and measurement for vibration in buildings: Part 2 Guide to damage levels from ground-borne vibration, 1993

[10] this document was published in 1988 and is not available electronically, however a summary is available in: Highways Agency, Design Manual for Roads and Bridges, Vol. 11, Section 3, Part 7, August 1994

[11] Highways England, Sustainability & Environment Appraisal LA 111 Noise and vibration, Rev. 1, 2020

[12] British Standards Institute, BS 4142:2014+A1:2019, Methods for rating and assessing industrial and commercial sound, 2019

8.17. Development related noise exposures which fall between LOAEL and Significant Observed Adverse Effect Level (SOAEL) have the potential to constitute a significant effect, subject to additional considerations and their relationship to one another, namely: Absolute noise level; Change in noise levels; and Receptor type (community population).

8.18. For non-residential receptors, external noise impact criterion will be determined dependant on the use, and in accordance with relevant British Standards and Guidance. Where the impact criterion is predicted to be met, then no further assessment will be required. Where the impact criterion is predicted to be exceeded, then consideration will be given to additional factors. Based on the likely types of non-residential receptors at this stage, it is proposed that the external noise impact criterion below will be adopted.

Non-Residential Receptor External Noise Impact Criterion (Fixed/mobile plant & traffic noise)

Non-residential Receptor Group	**Daytime 0700-2300hrs Impact Criterion dB $L_{Aeq,16h}$**	**Night-time 2300-0700hrs Impact Criterion dB $L_{Aeq,8h}$**	**Reference**
Educational	50	Not Applicable	BB93:2015
Healthcare	55	50	HTM08-01:2013

8.19. The assessment of significance of vibration effects from fixed and mobile plant on residential receptors will be based upon the absolute values of the predicted vibration effects, when compared against relevant thresholds. Thresholds will be determined in accordance with BS 6472:2008 and BS 7385:1993 (for cosmetic damage). Where levels of vibration are likely to exceed these thresholds, it will indicate a significant adverse effect.

8.20. An assessment of the Site's suitability for its proposed residential development and educational use will be undertaken. The residential site suitability assessment will be undertaken in accordance with ProPG '*Professional Practice Guidance: Planning & Noise - New Residential Development*' (ProPG, 2017[13]), and will include an assessment as to whether internal noise guidelines, as per British Standard 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*' (BS 8233, 2014[14]), are likely to be achieved.

8.21. As the development will also include a school, an assessment will be undertaken with reference to the Department of Education publication '*Acoustic Design of Schools: Performance Standards, Building Bulletin 93*' (2015) and the joint published Institute of Acoustics (IoA) and Association of Noise Consultants (ANC) publication '*Acoustics of Schools: a design guide*'.

SIGNIFICANCE OF RESIDUAL EFFECTS

8.22. The assessment will focus on determining an appropriate scheme design so as to ensure that effects will normally be 'not significant'. Where significant effects remain, recommendations will be made in order to minimise noise and vibration effects as far as is practicable and reasonable to do so in relation to the Proposed Development.

[13] Association of Noise Consultants, Institute of Acoustics and Chartered Institute of Environmental Health. ProPG 'Professional Practice Guidance: Planning & Noise - New Residential Development', 2017

[14] British Standards Institute. British Standard 8233:2014 'Guidance on sound insulation and noise reduction for buildings', 2014

9. Drainage and flood risk

INTRODUCTION

9.1. The EIA will consider the likely potential effects of the Proposed Development on surface water, ground water, drainage and flood risk of the Site and surrounding area.

STUDY AREA

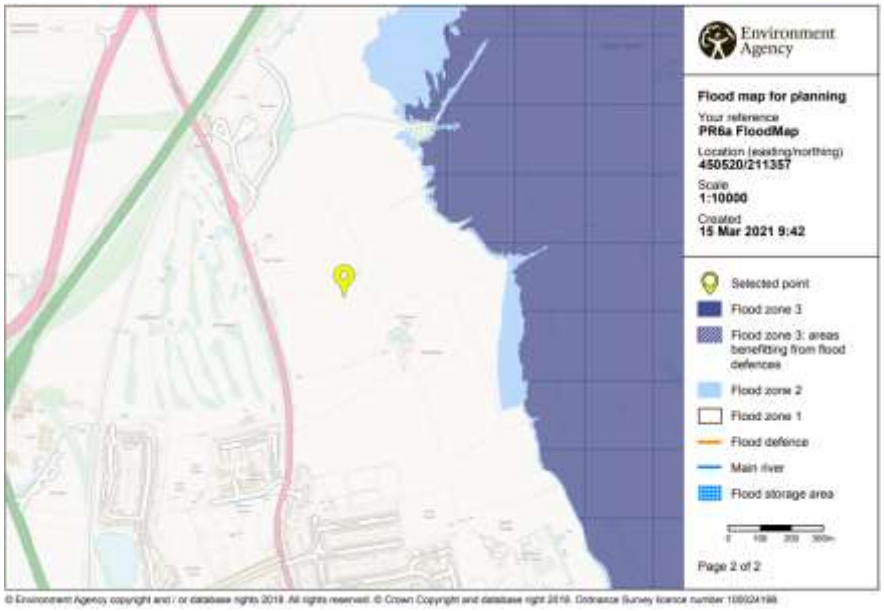
9.2. The potential sources of impact on hydrology and hydrogeology will be assessed by completion of a desk study, which will set the study area and confirm sensitive receptors.

BASELINE

9.3. The Site extends to approximately 48ha of agricultural land alongside the A4165 Oxford Road to the north of Oxford. The land generally falls away from two main high points. The first is located in the centre of the Site along the A4165, with land falling to the north, and to the east towards St Frideswide Farm. The second high point is located along the southern boundary, with land falling from this point to the east towards the River Cherwell, and to the north towards St Frideswide Farm.

Fluvial flooding

9.4. An extract from the Environment Agency's (EA) published Flood Map for Planning is shown below.



Flood Map for Planning (Environment Agency)

9.5. The proposed development site is located within Flood Zone 1, indicating that the fluvial flood risk is low. The Site is considered to have a <0.1% Annual Exceedance Probability (AEP). i.e., less than 1 in 1,000-year chance of flooding from a river. All types of development are suitable within Flood Zone 1 according to the National Planning Policy Framework (NPPF). At this stage hydraulic modelling is not considered to be required to support the FRA for the planning application.

Surface Water Flooding

9.6. According to the EA's Map of Flood Risk from Surface Water shown below, the Site is shown to be generally

at a very low risk from surface water flooding. Surface water flows are predominantly associated with the ditches and watercourse within natural depressions and valley lines where water collects and is conveyed from the Site during rainfall events.

9.7. The drainage catchment is hydraulically connected to the wider land drainage network, conveying runoff from third party land 'upstream' of the Site. The catchment drains to the Cherwell River, a small 'ordinary' watercourse beyond the eastern boundary of the Site.

9.8. The surface water drainage strategy will be designed to ensure that the proposed development achieves pre-developed conditions (i.e. greenfield runoff rates) through sustainable drainage techniques. Such measures will maintain the status quo and ensure that there is no increase in flood risk elsewhere, as a minimum, but seek betterment where this is feasible

Flood Risk from Surface Water (Environment Agency)

Ground Conditions

9.9. Geological maps published by the British Geological Survey (BGS) indicate that the Site is underlain by a bedrock geology of Oxford Clay Formation and West Walton Formation, consisting of mudstone.

9.10. The groundwater vulnerability map published by the EA indicates that the bedrock geology underlying the Site is associated with a negligibly permeable non-aquifer, whilst the superficial deposits of sand and gravel in the south-east of the Site are associated with a variably permeable minor aquifer of low leaching potential.

9.11. The bedrock aquifer designation map published by the EA shows the mudstone bedrock underlying the majority of the Site is classified as unproductive strata. Unproductive Strata indicates regions where layers of rock or drift deposits have low permeability and have negligible influence on water supply or river base flow.

9.12. The superficial sand and gravel deposits in the south-east of the Site are associated with a Secondary A aquifer. Secondary A aquifers indicate regions where layers of rock or drift deposits are permeable and therefore are capable of supporting water supply on a local scale and may provide a source of base flow to rivers.

9.13. There are no groundwater Source Protection Zones (SPZs) within the Study Area.

9.14. Further consideration of local abstractions will be carried out to ensure that the proposed development does not have an adverse impact on the quality and supply of ground and surface water.

9.15. The Cranfield University Soilscape viewer describes the soils across the Site as slightly acidic but base-rich loamy and clayey with slowly permeable seasonally wet drainage conditions. Infiltration testing will inform the extent to which soakaways are feasible in the surface water drainage system.

Water Quality

9.16. The Site falls within the Thames River Basin, which extends from Gloucester in the west to the Thames Estuary in the east. The Site is within the Cherwell operational catchment, which includes 24 waterbodies assessed against the Water Framework Directive (WFD) objectives.

9.17. The EA employs a method for assessing the environmental conditions or 'status' of a water body according to the objectives set out in the WFD every six years. The catchment lies within the Cherwell River waterbody, the status of which was classified overall as Moderate by the 2019 WFD assessment. Good status was not achieved due to the impacts of sewage discharge from the water industry, and diffuse pollution from poor livestock management and transport drainage.

9.18. The EA is seeking improvements to the water quality of the local watercourse systems that connect with the WFD assessed waterbody in order to achieve a status of Good by 2027.

9.19. According to MAGIC Maps (DEFRA) the Site is located within a Nitrate Vulnerable Zone (NVZ) and as such is affected or at risk of nitrate pollution from agricultural practices.

Water resources

9.20. It is recommended that all new homes are built to the water consumption standards of The Building Regulations 2010 Part G (or applicable equivalent at the time) as a minimum in order to reduce demand from new households.

9.21. With regards to wastewater and sewerage infrastructure, Thames Water and the EA will be consulted to establish the principles of accepting foul drainage into the drainage network for treatment.

Designated Sites

9.22. According to MAGIC Maps, the nearest designated site is the Port Meadow with Wolvercote Common and Green SSSI which is 1.7km to the south-west. On account of spatial separation and topography, it is considered that there is no hydraulic connectivity with the proposed development site. The New Marston Meadows floodplain about 3km downstream on the River Cherwell is designated as a SSSI.

POLICY AND GUIDANCE

9.23. Methods of assessment employed will be consistent with current best practice recommendations in the form of statutory documents and recognised publications to ensure that the findings represent a robust approach to the assessment.

9.24. The assessment of flood risk and drainage will be carried out with due regard to the following policy and guidance:

- National Planning Policy Framework (NPPF) and Planning Practice Guidance;
- Cherwell Local Plan 2011-2031 (Part 1);
- Cherwell Local Plan 2011-2031 (Part 1) Partial Review;
- Cherwell District Council Level 1 Strategic Flood Risk Assessment (SFRA) Update, May 2017;
- Cherwell District Council Level 2 SFRA, May 2017.

ASSESSMENT SCENARIOS

9.25. An assessment of the potential direct and indirect effects during the construction and operational phases of the proposed development will be undertaken based on a review of published data, impacts identified within the site-specific FRA and Drainage Strategy and liaison with statutory authorities such as the LLFA and Thames Water.

9.26. Recommendations for appropriate mitigation measures will be made in order to minimise the potential effects of the proposed development on local sensitive water resources in terms of quality and flood risk. The drainage strategy will account for cumulative effects associated with the future development of PR6b to the west of Oxford Road, and as appropriate, the adjacent development of St Frideswide Farm by Croudace Homes to the south, to be accessed off Banbury Road.

CONSTRUCTION ASSESSMENT

9.27. As part of the scoping process the potential impacts and significance of effects to key sensitive receptors within the local water environment will be considered for the construction phase of the development. Potential impacts could include the accidental spillage of fuel oils, leaching of contamination, vehicle washing, suspended solids in surface water runoff etc. These potential impacts will be suitably mitigated as part of a Construction Environment Management Plan setting out site specific measures.

ASSESSMENT OF THE COMPLETED DEVELOPMENT

9.28. Potential impacts and significance of effects to key sensitive receptors within the local water environment will be considered for when the development is occupied. Without appropriate mitigation, the proposed development will result in an increase in impermeable area and increase the rate and volume of surface water runoff.

9.29. The Flood Risk Assessment (FRA) will assess the level of flood risk to the proposed development and surrounding area, and will be carried out to ensure that there are no adverse effects to the Site or surrounding area. This assessment and the design of any mitigation measure required will take account of future climate change to ensure that the development remains safe from flood risk during its lifetime. As part of the drainage strategy, the proposed surface water drainage system will be designed to sustainably replicate natural drainage as closely as possible.

9.30. In respect of the quality of surface water runoff from the proposed development, the surface water strategy will offer a level of treatment to improve the quality of runoff discharged from the Site, whilst also providing areas of biodiversity and amenity for the local area as an additional benefit.

SIGNIFICANCE OF RESIDUAL EFFECTS

9.31. The assessment will consider the residual risk posed to the Site from sources such as groundwater and surface water. An initial appraisal suggests that the impact of any residual risk associated with these sources is low. Smaller localised flood sources, such as sewers or small drains, will also need to be considered as part of the drainage assessment (FRA).

10. Biodiversity

INTRODUCTION

10.1. The Ecology and Nature Conservation Chapter of the Environmental Statement will be prepared by the Environmental Dimension Partnership (EDP), with reference to best practice guidance.

10.2. The Ecological Impact Assessment (EcIA) will include a summary of the current ecology baseline conditions within the site and assess the likely significant effects of the proposed development on Important Ecological Features (IEFs) such as designated sites, habitats and populations of protected or notable species. Where 'significant' effects cannot be avoided through inherent design, the EcIA will recommend additional mitigation and/or compensation measures.

BEST PRACTICE GUIDANCE

10.3. The approach taken in this assessment is made with reference to the guidelines published by the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland, September 2018 (Version 1.1, updated September 2019).

10.4. The extent of the impact assessment is defined as the Zone of Influence (ZoI). The ZoI will be determined through a review of the baseline ecological conditions relative to the emerging masterplan and consideration of the proposed activities, as well as through liaison with other specialists involved in assessing the impacts of the proposed development as considered within the Environmental Statement and other supporting documentation.

10.5. The identification and evaluation of Important Ecological Features (IEFs) for the purposes of EcIA, and the assessment of significant adverse or beneficial effects on IEFs, will be undertaken with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) 'Guidelines for Ecological Impact Assessment in the UK and Ireland, September 2018 (Version 1.1, updated September 2019). The guidelines propose an approach to valuing ecological features that involve professional judgement based on available guidance and information, together with advice from experts who know the locality of the project and/or the distribution and status of the species or features that are being considered.

10.6. In addition, the following best practice guidance in relation to survey techniques has been taken into account throughout the completion of baseline studies, and will be referred to in regard to any mitigation/ compensation measures proposed within the EcIA:

- Joint Nature Conservation Committee, (2010). Handbook for Phase 1 habitat survey: A Technique for Environmental Audit;
- English Nature, (2004). Bat Mitigation Guidelines;
- Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed). The Bat Conservation Trust, London;
- Joint Nature Conservation Committee, (1999). Bat Workers Manual;
- Paul Bright, Pat Morris and Tony Mitchell-Jones. (2006) 'The dormouse conservation handbook', Second edition. English Nature;
- Marchant, J. H. (1983). Common Birds Census Instructions. BTO, Tring. 12pp.;
- Marchant, J. H., Hudson, R., Carter, S. P. & Whittington, P. A. (1990) Population Trends in British Breeding Birds. BTO, Tring;
- Gilbert, G., Gibbons, D. W. & Evans, J. (1998) Bird Monitoring Methods. RSPB, Sandy, Bedfordshire;
- Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidelines Series). Eds Fiona Mathews and Paul Chanin. The Mammal

Society, London.

- Harris, S., Cresswell, P., and Jeffries, D.J. (1989). Surveying Badgers, Mammal Society, London;
- Froglife. (1999). Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10, Froglife, Halesworth;
- Gent, T., Gibson, S. (1999). Herpetofauna Workers Manual. JNCC; and
- English Nature, 2004. Reptiles: Guidelines for Developers.

10.7. The Guidelines recommend that the value or potential value of an ecological resource or feature be determined within a defined geographical context, with the assessment of impacts undertaken in relation to the baseline conditions within the ZoI that are expected to occur if the development were not to take place. The Guidelines also recommend that the process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. Impacts will therefore be assessed in the context of the baseline conditions within the ZoI during the lifetime of the proposed residential development.

10.8. Having identified the activities likely to cause significant impacts, it is then necessary to describe the resultant changes and to assess the impact on valued ecological features. In accordance with the CIEEM Guidelines for EcIA, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for the identified IEFs. The use of significance criteria or matrices are not supported by the CIEEM Guidelines. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local. Significant effects should be qualified with reference to an appropriate geographic scale. For example, a significant effect on a SSSI is likely to be of national significance. However, the scale of significance of an effect may not be the same as the geographic context in which the feature is considered important.

10.9. The assessment of construction and operational effects on IEFs will be undertaken both before and after consideration of additional mitigation measures; the latter represents the assessment of residual effects, but including inherent measures incorporated into the proposals e.g., retention of habitats. In addition, the potential for cumulative impacts to arise from the in-combination effects with other development proposals will also be assessed.

EXISTING BASELINE CONDITIONS

10.10. The EcIA will be based on the ecology baseline gathered by EDP between 2015 and 2021. The baseline ecological investigations undertaken so far at the site include a desk study (2015, updated in 2017), Extended Phase 1 survey (2015, updated in 2017 and 2019), bat activity surveys (2017, updated in 2019), great crested newt surveys (2017, updated 2019), winter bird surveys (2017, updated 2019 and 2021), breeding bird surveys (2017, updated 2019), reptile surveys (2017, updated 2019), brown hairstreak survey (2019) and badger surveys (2015, 2017, 2019).

10.11. Further surveys are planned during 2021 to refresh the baseline, including an update desk study, an update Extended Phase 1 survey, and a hedgerow survey, update Great Crested Newt surveys (environmental DNA), and update bat activity surveys, bat tree roost potential surveys, an update breeding bird survey and an update brown hairstreak survey.

10.12. Baseline information gathered for the site will be provided in full detail within an ecology baseline report accompanying the EcIA, with such information gathered to date further summarised below for the purpose of scoping the ES.

Statutory Designations

10.13. The site is not covered by any statutory designations of national or international importance. However, there is one international designation within 10km of the Site, Oxford Meadows Special Area of Conservation (SAC), located approximately 1.5km south-west of the site at its closest point. This SAC is also covered by the following

Sites of Special Scientific Interest (SSSIs) which will be included within the assessment:

- Cassington Meadows SSSI;
- Pixey and Yarnton Meads SSSI;
- Wolvercote Meadows SSSI; and
- Port Meadow with Wolvercote Common and Green SSSI

10.14. The primary qualifying features of the Oxford Meadows SAC are: its Lowland Hay Meadow (*Alopecurus pratensis, Sanguisorba officinalis*), an Annex 1 habitat; and the presence of creeping marshwort (Apium repens), an Annex II species.

10.15. The four SSSIs, which combined comprise the full extent of Oxford Meadows SAC, are considered to be in favourable condition, with their habitats in 100% favourable condition for each of the SSSIs with the exception of Port Meadow with Wolvercote Common SSSI which has 1.29% of the land unfavourable though recovering, with all of the necessary management mechanisms in place to ensure favourable condition is reached. The favourable condition of the SSSIs suggest that the habitats are under suitable management and are resilient.

10.16. The key threats to the SAC, as identified by the Habitat Regulations Assessment (HRA) October 2014 [15] of the Cherwell Local Plan (2011 – 2031) [16] and its subsequent update in August 2018 [17] following the partial review of the Local Plan and the Oxford Meadows Site Improvement Plan [18], include the influence of invasive species on the current flora assemblage (with Crassula sp. present within this SAC) and adverse changes to hydrology.

10.17. Given the spatial separation of the site the proposed construction will not have a direct impact on the current floral assemblage present within the SAC. Any planting completed as part of the soft landscaping will be specified and agreed in advance, avoiding species which may be classed as invasive, with all planting subject to sensitive management over the long term. No significant impacts relating to invasive species in respect of their influence on the current floral assemblage are therefore expected to arise upon this SAC following development.

10.18. The site is hydrologically connected to the Thames via a ditch on the eastern boundary, which drains into the Cherwell. The Local Plan and associated HRA identify the potential for significant impacts upon the SAC via groundwater flows from the River Cherwell and its catchment, including the PR6a allocation. In recognition of the potential for adverse hydrological impacts, the Local Plan includes Policies ESD 8 and 9, which ensure that water quality, ground water flows and run-off rates remain unaffected by development. The development will therefore necessarily be constructed in compliance with this policy, with mitigation designed to address those requirements of the planning policy.

10.19. The HRA also identifies the potential for significant effects as a result of increased recreational disturbance due to increased numbers of visitors arising from the development, such as the PR6a allocation. The majority of visitors to the SAC are from within 1.9km of the SAC, which includes much of the site. The provision of adequate, high quality, public open space will reduce the potential for those impacts to arise, with the Local Plan including policies ESD17, BSC10 and BSC11, which will further reduce the likelihood of significant impacts.

15 Cherwell District Council - Submission Cherwell Local Plan incorporating Proposed Modifications (October 2014) Habitats Regulations Assessment: Stage 1 – Screening

16 Cherwell Local Plan 2011 – 2031, Part 1 Adopted 20 July 2015 (incorporating Policy Bicester 13 re-adopted on 19 December 2016) July 2015

17 Habitat Regulations Assessment Report on the Partial Review of the Cherwell Local Plan 2011-2031 (Part 1): Oxford's unmet housing needs Proposed Submission Plan

18 Oxford Meadows Site Improvement Plan - Improvement Programme for England's Natura 2000 Sites (IPENS)

10.20. The HRA therefore concludes no adverse effects upon the integrity of Oxford Meadows SAC will arise from the PR6a allocation in respect of hydrological and recreational disturbance pathways, subject to policy compliance. Nonetheless, it is proposed to scope in Oxford Meadows SAC to the EcIA as an IEF of international importance.

Other National Designations

10.21. In addition to the above SAC and associated SSSIs, there are a further nine national designations within the Site's potential zone of influence, in this case set at 5km, including the following SSSIs:

Other National designations within 5km of the Site

Site Name	Distance	Interest Feature(s)
Hook Meadow and The Trap Grounds SSSI	1.6km SW	A series of unimproved neutral meadows with associated bird and invertebrate assemblages
Woodeaton Quarry SSSI	2.3km E	Designated for its geological interest
New Marston Meadows SSSI	2.5km S	A series of agriculturally unimproved neutral meadows on the floodplain of the River Cherwell
Woodeaton Wood SSSI	2.6km E	An intact relic of the ancient Shotover Forest, noted for the occurrence of several local uncommon plant species
Rushy Meadows SSSI	3.1km NW	A series of unimproved alluvial grasslands alongside the Oxford Canal, with meadow and fen communities
Wytham Ditches and Flushes SSSI	3.3km W	Ditches supporting a species-rich eutrophic aquatic and fen flora with flowering plants which are now uncommon in central southern England
Wytham Woods SSSI	3.7km SW	A complex of ancient woodland, wood pasture, common land and old limestone grassland with nationally notable plants, considerable lower-plant flora and an extremely diverse insect fauna
Sidling's Copse and College Pond SSSI	3.8km SE	A mosaic of several habitats including calcareous fen, carr, broadleaved woodland scrub, reedbed, open water and acid and limestone grassland
Magdalen Grove SSSI	4.2km S	Designated for its geological interest

10.22. The site falls outside of the Impact Risk Zone (IRZ) for residential development for all of the SSSI listed above. Therefore, owing to the degree of spatial separation from, and the lack of any direct habitat linkage to, these SSSIs, it is considered that the proposed development of the site would have no significant, direct effects upon the special interest features of any of those SSSIs listed above. However, as outlined previously above in relation to international sites, in the absence of mitigation there is a potential for indirect, hydrological impacts upon national sites with interest features associated with the Thames and Cherwell catchments, i.e. all of those listed above apart from Woodeaton Quarry, Woodeaton Wood and Magdalen Grove SSSIs. The remainder of those nationally designated sites listed above are therefore scoped into the EcIA as an IEF.

Non-Statutory Designations

10.23. Twenty non-statutorily designated sites occur within 2km of the site, as listed in the table below:

Non-statutory designations within 2km of the Site

Site Name	Distance	Interest Feature(s)
Local Wildlife Sites		
Meadows West of the Oxford Canal	1.1km W	Wet meadows bordered by species-rich hedges.
Meadow North of Goose Green	1.4km SW	Small meadow with a mixture of tall wetland habitat and wet grassland.
Canalside Meadow-Oxford Canal Marsh	1.4km SW	Wet meadow with rare marsh habitat, including sedge dominated fen.

Site Name	Distance	Interest Feature(s)
Duke's Lock Pond	1.5km W	Diverse pond with extensive reedbed
Loop Farm Flood Meadows	1.6km W	Wet, species-rich, cattle grazed pasture with a small area of reedbed and some recovering fen and elements of lowland meadow habitats.
Wet Wood and Swamp nr. Yarnton	1.6km W	Wet willow woodland and tall wetland vegetation.
Almonds Farm and Burnt Mill Fields	1.6km SE	Flush along ditch and tall fen vegetation in field to west. A number of botanical rarities
Long Wood	2.0km E	Semi-natural, ancient, broadleaved woodland/coppice with good ride.
Cassington to Yarnton Gravel Pits	2.0km W	Large area of gravel pits, developing reedbed and silt lagoons with important populations of wintering wildfowl and diverse wetland vegetation.
Proposed Local Wildlife Sites		
Bypass Meadows	0.9km S	Two fields with rough grassland, tall herb and pond sedges.
Cassington to Yarnton Pits East Extension	1.7km W	No information provided
Line Ditch	1.8km S	A drainage ditch approximately 1km long. Well vegetated with common reed and greater pond sedge.
Wolvercote Mill Swamp	1.9km SW	Small area of wetland habitat between two channels of the River Thames
Sites of Local Importance for Nature Conservation		
Linkside Lake	0.6km SW	Eutrophic standing water with grass snake, and various plant and bird species
Oxford Canal	1.5km SW	Canal supporting a variety of flora and fauna, with well vegetated banks. Forms a corridor from countryside into the city.
Duke's Meadow	1.5km SW	Two fields with remnants of lowland meadow habitat.
Victoria Arms Spinney	2.0km SE	Small area of secondary woodland.
Others		
Stratfield Brake Woodland Trust Reserve	1.2km WNW	Mature and new woodland adjacent to a large wetland project and open ground.
North Meadow West of Canal	1.2km NW	Small area of unimproved grassland (lowland meadow remnant and floodplain grazing marsh), including some species-rich areas.
Oxey Mead Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust Reserve	2.0km W	Pixey and Yarnton Meads SSSI

10.24. No direct impacts are anticipated as a result of a spatial separation and a lack of receptor pathways. However, as noted above in relation to internationally and nationally designated sites, there is potential for indirect, hydrological impacts upon wetland and floodplain meadow sites associated with the Rivers Thames and Cherwell. For that reason, all but Stratfield Brake WTR, Victoria Arms Spinney SLINC and Long Wood LWS will be included as IEFs within the EcIA.

HABITATS

10.25. The site is dominated by intensively cultivated arable land of negligible ecological value. However, a number of locally valuable habitats are present including mature trees and hedgerows.

10.26. The habitats present within the site do not pose an 'in-principle' development constraint and, owing to their distribution within the site there is scope to retain much of the more valuable habitat such as the hedgerows and mature trees within the masterplan. The site also provides ample opportunity to mitigate habitat loss, where this is unavoidable, through new habitat creation and restoration elsewhere.

10.27. Despite this, some loss of hedgerows will likely arise, and some loss of mature trees is possible. Hedgerows and trees will therefore be included as an IEF within the EcIA.

SPECIES

10.28. Species populations identified through field surveys undertaken so far include:

Wintering Birds

10.29. Surveys of the site in 2017, 2019 and 2021 have identified an assemblage of wintering birds including a small number of declining farmland species, such as linnet, yellowhammer and skylark. However, their numbers have been consistently low such that wintering birds will be scoped out as an IEF within the EcIA.

Breeding Birds

10.30. Surveys of the site in 2017 and 2019 have identified an assemblage of breeding birds including a declining farmland species such as lapwing, yellow wagtail, linnet, yellowhammer and skylark. As a result, breeding birds will be included as an IEF within the EcIA.

Great Crested Newt

10.31. Surveys of the off-site ponds in 2017 and 2019 have not confirmed the presence of great crested newt, despite a small number of records in the local area. As a result, great crested newt will be scoped out as an IEF within the EcIA.

Common Reptiles

10.32. Surveys of the rough grass margins have recorded a small population of grass snake, primarily associated with the boundary running to the west of the off-site orchard at St Frideswide's Farm. Given the population's size (peak count of 2 individuals), common reptiles will be scoped out as IEFs within the EcIA.

Bats (roosting)

10.33. The Extended Phase 1 survey identified ten mature trees within the site which appear to provide suitable features for roosting bats. It is likely that the majority of these trees will remain unaffected by the proposals. Where trees will be removed, any loss of roost features will be mitigated through the inclusion of additional roost features provided within the proposed development. In the absence of more detailed survey information, roosting bats will be included as IEFs within the EcIA.

Bats (foraging/ commuting)

10.34. Low to moderate levels of bat foraging activity have been recorded for the site to date, dominated by common and widespread species. However, registrations of the Annex II species barbastelle have been recorded. Development will seek to buffer suitable foraging habitats by at least 10m and to retain dark corridors through the implementation of a sensitive lighting strategy to prevent negative impacts on foraging/commuting bats.

10.35. Foraging and commuting bats will be included as IEFs within the EcIA.

Dormouse

10.36. Dormouse has been scoped out of the EcIA due to a lack of suitable woodland within or nearby the site alongside a lack of suitable hedgerow connections to the wider landscape. Furthermore, no records were returned

within the TVERC data search in 2017 or 2019. Dormouse will therefore not be included as an IEF within the EcIA.

Otter and Water Vole

10.37. Both otter and water vole have been scoped out of the EcIA due to a lack of suitable habitat. A small stream exists along the site's eastern boundary; however, this does not represent suitable breeding habitat for water voles or dispersal, foraging or resting habitat for otters. These species will therefore not be included as IEFs within the EcIA.

Badger

10.38. Some evidence of badger activity was recorded within the site during the initial Extended Phase 1 survey undertaken in 2015, although no badger setts were recorded at that time. However, a partially active, single-hole outlier sett was recorded to the south-east of St Frideswide's Farm during an update survey in 2018. Badgers are legally protected for animal welfare reasons. Therefore, badgers will be scoped in as an IEF within the EcIA.

Brown Hairstreak Butterfly

10.39. A small number of eggs were found within suitable blackthorn across the site in 2019. The current hedgerow management regime limits the potential of this species within the site, and although a breeding population of this butterfly is considered present within the site, its population is considered to be very small. The species will therefore be scoped out as an IEF within the EcIA.

SCOPE OF ASSESSMENT

10.40. Provisionally, based on the existing baseline information summarised above, and subject to the findings of any remaining surveys, the following IEFs have been identified and will be scoped in to the EcIA. It is anticipated that through sensitive design of the masterplan and suitable mitigation, no residual effects will remain upon IEFs scoped into the assessment:

Statutory designations:

- Oxford Meadows SAC;
- Cassington Meadows SSSI;
- Pixey and Yarnton Meads SSSI;
- Wolvercote Meadows SSSI;
- Port Meadow with Wolvercote Common and Green SSSI;
- Hook Meadow and The Trap Grounds SSSI;
- New Marston Meadows SSSI;
- Rushy Meadows SSSI;
- Wytham Ditches and Flushes SSSI;
- Wytham Woods SSSI ; and,
- Sidling's Copse and College Pond SSSI.

Non-statutory designations:

- Meadows West of the Oxford Canal LWS;
- Meadow North of Goose Green LWS;
- Canalside Meadow-Oxford Canal Marsh LWS;
- Duke's Lock Pond LWS;
- Loop Farm Flood Meadows LWS;
- Wet Wood and Swamp nr. Yarnton LWS;
- Almonds Farm and Burnt Mill Fields LWS;
- Long Wood LWS;

- Cassington to Yarnton Gravel Pits LWS;
- North Meadow West of Canal;
- Oxey Mead BBOWTR;
- Bypass Meadows pLWS;
- Cassington to Yarnton Pits East Extension pLWS;
- Line Ditch pLWS;
- Wolvercote Mill Swamp pLWS;
- Linkside Lake SLINC;
- Oxford Canal SLINC; and,
- Duke's Meadow SLINC.

Species:

- Breeding birds;
- Roosting bats; and,
- Foraging/commuting bats.

10.41. Although not IEFs which would be subject to an assessment of potential significant effects, it is recognised that any pertinent legal protection afforded to common reptiles and badger will also be covered within the ES for completeness.

POTENTIAL EFFECTS

10.42. It is recognised that, in the absence of mitigation, the proposed development of the site has the potential to adversely affect those IEFs present. However, it is considered highly unlikely that the form of development proposed would result in 'significant' effects on ecological receptors in the event that it is implemented, given its required compliance with local and national planning policy and relevant wildlife legislation.

CUMULATIVE EFFECTS

10.43. The evaluation of cumulative effects on designated sites, habitats and species requires knowledge of the developments proposed in the immediate landscape around the site.

10.44. In this assessment EDP have scoped out the potential for significant negative effects on nationally designated sites, locally designated sites, onsite habitats and species assemblages including breeding birds, bats (roosting and foraging/commuting), common reptiles and badger. Given that there is no predicted significant negative effect on these ecological features, there is not anticipated to be any resultant cumulative effects of significance in combination with other proposed developments.

10.45. Significant negative effects potentially arising upon the Oxford Meadows SAC have been scoped in for further assessment. To assess the potential cumulative impacts appropriately however, EDP would require information for each of the nearby allocated sites to identify where areas of new development are proposed within the local landscape in relation to this SAC and their proximity to connecting/functionally linked habitats, the potential scope of habitat loss/disturbance and their species assemblages present, so as to gain a greater understanding of the likely effects. As this information is not currently available, it is not possible to assess these impacts fully at this stage.

11. Landscape effects and visual amenity

INTRODUCTION

11.1. Landscape and visual effects are independent but related issues. Landscape effects relate to changes to the landscape fabric and the features contained within the landscape character; visual effects relate to the appearance of such changes within views and the resulting effect on visual amenity.

11.2. The landscape and visual assessment will examine the current landscape and visual baseline conditions within the site and evaluate the site in its broader context with reference to sensitive visual receptors and landscape designations. The assessment process will involve an ongoing analysis of the likely landscape and visual effects of the evolving development proposals and, where 'significant' impacts cannot be avoided through design, will recommend additional mitigation measures.

CONTEXT

LANDSCAPE CHARACTER

11.3. The site comprises predominantly midsized arable fields divided by native hedgerow and sparsely scattered hedgerow trees. It is bordered to the east and north by further agricultural land but remains influenced by urbanising features including Oxford Parkway and Water Eaton Park and Ride to the north, Oxford Road to the west, the settlement edge of Cutteslowe and Cutteslowe Park bordering to the south and the presence of electricity pylons and overhead cables immediately east of the site. PRoW Bridleway 229/9/80 and Footpath 229/8/10 run north-east to south-west across this area, to Oxford Road, with the footpath connecting to the road via a permissive route.

Oxfordshire Wildlife and Landscape Study (OWLS)

11.4. A review of the OWLS landscape character assessment finds that the site is located within the 'Vale Farmland' landscape type (LT). The following key characteristics described in the Vale Farmland LT were found to be consistent with the area around the site:

- A gently rolling landscape associated with clay soils;
- Medium to large regularly shaped arable fields and more localised smaller grass fields;
- A well-defined hedgerow pattern with characteristic hedgerow trees;
- Occasional ditches and minor streams bordered by crack willows and ash; and
- A nucleated pattern of small, compact villages.

11.5. However, whilst the site conforms to some of the character descriptions of the LT, the following differences are noted:

- Abrupt post war settlement edge contains the site to the south;
- The site is bounded by the settlement edge of Cutteslowe to the south, which introduces urbanising elements including residential development and sports pitch flood lighting columns at Cutteslowe Park, which would be more prominent at night when lit;
- The Oxford Parkway and Water Eaton Park and Ride bound the site to the north, introducing urbanising elements to the northern field;
- Pylons and overhead cables cross the valley landscape immediately to the east of the site, and cross the northern tip of the site; and
- The area to the west of Oxford Road has a character influenced by urbanising and recreational features.

11.6. Although now very dated, at a more detailed district level the Cherwell District Landscape Assessment (CDLA; November 1995) remains the definitive landscape assessment and it defines that site as falling within the Otmoor Lowlands. The key characteristics identified for the site and its immediate context include:

- Traditional land use has consisted of grazed wet meadow with willow pollards lining streams and drainage ditches. However, owing to improvements in drainage, substantial areas of land are now in arable cultivation;
- Fields are large and regular with weak boundaries, creating an open, exposed landscape;
- Patterns of smaller fields on steeper slopes to the south with open grazing persisting on the higher open ground with remnant upland heath characteristics on the highest slopes;
- Isolated hills have woodland cover on their brows and tend to be surrounded by military development;
- The roads that cross the landscape are usually built up above the level of surrounding fields; and
- Very few trees to interrupt long views across the floodplain.

Cherwell District Council Local Plan Part 1 Partial Review Landscape Character Sensitivity and Capacity Assessment (WYG, June 2017)

11.7. The site lies within the area of land described as 'LSCA38 North Oxford Triangle, Kidlington', which also includes an area of land between the A34 and Oxford-Bicester railway line. There is a recognised contrast in landscape between the artificial landscape of the golf course, which is "very enclosed and inwardly focussed", and the arable land to the east of the Oxford Road, with its typically characteristic landscape and "broader views across the site area and the wider landscape offering panoramic views", although all views from the site to the south "are restricted by the urban fringe". Thus, the study has assessed the landscape of LSCA38 to possess combined medium sensitivity in terms of landscape character and visual sensitivity.

11.8. In terms of visual sensitivity, the study states that "the majority of users with views into the area are those using the public footpaths and members of the golf club" and therefore the overall sensitivity of the population is considered to be of medium to high sensitivity, although it recognises that views from the road corridors of Oxford Road and the A34 "are transient views and of a short duration and of low sensitivity".

11.9. In terms of mitigation to visual receptors, the Cherwell study finds that:

"Potential exists to provide mitigation planting within the east and west land parcels without altering the character and appearance of the land; this would comprise the reinstatement and improvement of field boundaries and the potential for the creation of wider hedgerow boundaries to increase screening. There is limited potential for mitigation within the golf course".

11.10. In the Cherwell study's assessment of landscape capacity for development, it finds that there is a medium capacity for residential development on the site "as this would form a natural extension to the northern edge of Cutteslowe" and "infilling of land between the A4165 Oxford Road and the A34". Although it finds that "the west part of the east land parcel where infilling north of Cutteslowe northwards to the park and ride could be accommodated", the eastward extent of development would need to be carefully considered to maintain the "existing landscape context and intervisibility/visual separation with Water Eaton and Woodeaton".

11.11. It is the 'exposed nature' of the eastern part of the site that also leads to the study assessing a medium to low potential for formal or informal recreation due to the "effect this would have on the surrounding area.". Conversely, the existing recreational land use of the central part of the site (the golf course) results in a high potential for recreational development.

VISUAL AMENITY

11.12. A combination of long distance and short distance views are available out towards the wider landscape. This is primarily achieved through a lack of boundary vegetation along the site's eastern extent as well as the falling and rising topography of the Cherwell Valley.

11.13. Within the site, and to the north of St Frideswide's Farm, is Bridleway no. 229/9/30 which crosses the site from Oxford Road towards Water Eaton Manor. The adjacent field boundary hedgerow filters views to the south, focusing attention on the open views across the northern part of the site that slopes down towards the Oxford Parkway Station, the A34 and the distant landscape beyond, to the north and north-east.

11.14. The most sensitive public receptors to development will be the wide network of PRoW across the open agricultural landscape to the north of Oxford and east of Oxford Road that have visibility of the site. These receptors are of high sensitivity to change and their visual amenity will be a consideration in the development of the masterplan layout and landscape strategy. The proposed LVIA viewpoints, shown in Appendix 3: Section 18, are submitted for CDC's comment and agreement.

11.15. Short range visibility of the site from the road network is limited to the existing settlement edge and major routes including Oxford Road and the A34, which are of low sensitivity to change. Oxford Road would be most impacted by development to either side, however, visibility towards the surrounding landscape is strongly filtered by mature trees and woodland lining the road. Retention of the trees would minimise effects upon this receptor but this will be reviewed as part of the masterplanning of the site

11.16. There are no minor rural roads with close proximity views of the site due to the floodplain of the Cherwell Valley to the east and strong visual screening of the golf course to the west.

11.17. Existing vegetation screening on the existing settlement edge would act to mitigate visual effects upon many residential receptors. A limited number of properties with open views would be considered in designing the masterplan layout.

11.18. Similarly, users of the recreational spaces on the northern edge of the settlement will have open or filtered views of development on the site, although in the context of the existing urban edge. These receptors will be of medium sensitivity.

APPROACH

11.19. EDP's methodology for undertaking the LVA (included at Appendix 4: Section 19) follows the guidelines set out in the third edition of Guidelines for Landscape and Visual Impact Assessment (GLVIA) (Landscape Institute and Institute of Environmental Management and Assessment, 2013). This will be used as a basic approach and amended as necessary to cover specific site issues.

11.20. The first stage of the assessment has established the baseline conditions of the site and surrounding area, it has identified the landscape character and key features of the landscape and whether any landscape designations affect the site. Sources examined for the desktop study have included:

- Local Planning Policy;
- Landscape and Heritage Designations;
- Natural England's National Character Areas;
- District and local level Character Areas;
- Natural England's Natural Area Profile;
- Public Rights of Way;
- Local OS Maps and Aerial Photographs.

11.21. Site appraisals have already been undertaken, the purpose of which was to:

- Confirm the extent of study areas for the landscape and visual assessments respectively;
- Confirm status of baseline conditions identified by the desktop;
- Confirm the landscape character areas within the study area and compare these to the actual baseline condition. This will also include consideration of the findings of the Archaeology and Heritage, Ecology and Arboricultural assessments which present findings on features within the study area; and
- Identify the Primary Visual Envelope of the Site and record key viewpoints from within this, which will be used to inform the landscape and visual assessment. The proposed viewpoints, shown in Section 18, are submitted for CDC's comment and agreement.

11.22. The second stage of the landscape and visual assessment would seek to describe and make a judgement on:

- Effects on the Landscape Character: The effects which may arise as a result of the proposed development on discrete character areas and/or character types comprising features that may possess a particular quality or merit. In this case, the effects on the historic landscape will be considered and cross referenced with the Archaeology and Heritage ES Chapter; and
- Visual Effects: Effects that may arise as a result of the proposed development on views from visual receptors, such as users of local rights of way, and upon the amenity value of the views from surrounding uses.

11.23. The detailed methodology for the assessment of effects will be agreed with the LPA's landscape officer , including the number and location of viewpoints provided in this report.

11.24. As part of the development proposals, measures to mitigate any visual impacts and enhance the landscape value and visual quality of the area are integral to architectural and landscape design work and particularly pertinent to the proposed development. The approach of the developer is to produce a scheme of a high architectural and landscape quality and design, taking full account of the setting of the site. If adverse visual impacts are identified through the assessment, mitigation measures will be considered such as through choice of scale, massing, materials and finishes; and landscape strategy.

11.25. Finally, an assessment of any residual effects which may arise following the incorporation of mitigation measures will be undertaken and the significance of these effects stated. The evaluation of residual effects will be considered for Day 1 and Year 15. This allows for the consideration of the screening effects of screen planting that will be incorporated as mitigation for the development.

11.26. The final output of the exercise will be to provide text and illustrative material which:

- establishes the baseline conditions at a point at which the site will become available for development;
- assesses the landscapes sensitivity to change of nature and extent of the proposed development;
- assesses the landscape and visual impact of the development (including lighting) on the site and relevant surrounding area;
- identifies areas of landscape and visual concern and/or benefit in relation to the development and during its construction;
- advises on any proposals to mitigate significant negative effects; and
- identifies the residual impacts of the development.

12. Heritage

INTRODUCTION

12.1. The Archaeology and Cultural Heritage ES Chapter will be produced by EDP. EDP is undertaking a baseline Archaeology and Heritage Assessment for the site, including a programme of archaeological investigations, to evaluate the known and potential archaeological and historic resource within the site and a wider study area. The identified heritage assets will be placed in the local, regional and national context, and assessed against national criteria.

EXISTING BASELINE DATA

12.2. The site contains no designated heritage assets such as world heritage sites, scheduled monuments, registered parks and gardens, listed buildings or conservation areas, where there would be a presumption in favour of their preservation.

Designated Heritage Assets

12.3. A number of designated heritage assets are located in the wider landscape around the site, and therefore require consideration in terms of the potential for an impact upon them through change to their wider setting, as a consequence of development within the site.

12.4. The nearest designated heritage assets comprise the Grade II* listed St Frideswide's Farmhouse and associated Grade II listed garden wall, c.50m – 75m to the east.

12.5. More widely, there is a group of six listed buildings at Water Eaton Manor, over 1km to the northeast and a scattering of listed farmhouses across the surrounding landscape.

12.6. An appropriately detailed assessment will be undertaken of each of these designated heritage assets in an appropriate study area, to establish whether, and to what extent, the site makes a contribution to their heritage significance.

Non-Designated Heritage Assets

12.7. In respect of non-designated heritage assets, the known archaeological information contained within the Oxfordshire Historic Environment Record (HER), identifies two previously recorded non-designated heritage assets within the boundary of the site.

12.8. These comprise the ploughed remains of prehistoric funerary monuments (round barrows). These records, combined with the evidence of the archaeological resource in the wider area, indicates a high potential for prehistoric remains to be present within the site; a moderate potential for Roman remains and a low potential for early medieval and later remains, notwithstanding 'low value' features and deposit related to medieval and later agricultural practices (i.e. ridge and furrow).

12.9. Geophysical survey of the site has been undertaken, in addition to the first phase of a programme of archaeological trial trenching. The results of these surveys have confirmed the presence of the remains of the two barrows within the site, in addition to identifying the presence of Iron Age settlement activity and widespread agricultural activity dating from the medieval period onwards.

12.10. The results of the assessment and survey work undertaken in the site and the surrounding area in respect of the designated and non-designated heritage assets will form appendices to the ES chapter.

12.11. Consultation with the Oxfordshire County Council Archaeological Officer is being progressed to agree an appropriate level of assessment and investigation to inform an understanding of the archaeological potential of the site and the requirement for any appropriate mitigation.

PROPOSED METHODOLOGY

12.12. The first stage of the ES assessment is to establish the baseline conditions of the site and surrounding area.

12.13. The proposed scope of works includes an archaeology and heritage assessment of the historic environment at and around the site, including a programme of archaeological investigations. The aim of the assessment will be to identify, as far as is reasonable and proportionate, the nature of the archaeological and cultural heritage resource within the study area, to assess significance and to make appropriate recommendations for the future treatment of any remains which may be affected.

12.14. In addition to site visits, consultation with the following organisations and of the following documents will be undertaken:

- Oxfordshire County Council Historic Environment Record;
- Oxfordshire County Council Archaeological Officer;
- Oxfordshire Archives and other relevant repositories;
- Historic England (if required);
- Relevant Historic England Guidance;
- Historic Ordnance Survey Mapping;
- Historic aerial photography;
- Archaeological Data Service Online Catalogue; and
- Previous desk-based assessments, EIAs or fieldwork reports prepared for other sites within the vicinity.

12.15. In terms of the ES chapter, archaeology and cultural heritage receptors will be categorised in terms of their sensitivity in accordance with guidelines set out in the latest and most comprehensive best practice guidance provided in:

- National Planning Policy Framework (NPPF) (2019) Section 16 Conserving and enhancing the historic environment;
- Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets: Historic England Guidance published 2017;
- The Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 2 (LA104: Environmental assessment and monitoring) published by the Highways Agency in 2020; and
- Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment: Historic England Guidance published 2015.

12.16. These documents do not provide a prescriptive approach to assessment but identify principles and good practice that have been applied in the methodology for this assessment.

12.17. The assessment will identify and evaluate the nature and likelihood of the impacts of the development, in both the long and short term, on archaeological and cultural heritage features against clearly defined criteria in accordance with guidelines set out in the guidance above. Significance will be assigned to impacts relative to the sensitivity of the resource and the magnitude of impact, in accordance with best practice.

SIGNIFICANCE OF EFFECT

12.18. In line with the NPPF, and other industry standard best-practice guidance (as set out above), the assessment will first identify the heritage significance of relevant assets and thereafter assesses the impact of the proposals on

that significance. Impacts are not harmful unless they adversely affect a heritage asset's significance.

12.19. Having established the significance of heritage assets, and those that are sensitive to change resulting from the proposed development, the tables below set out the criteria that is then employed in attributing 'sensitivity' to archaeological and heritage assets, identifying the magnitude of any changes to them (i.e. the impact) and assessing the significance of the resulting effects in EIA terms.

12.20. The sensitivity of the heritage assets identified is assessed on the basis of the table below. The magnitude and significance of potential effects on archaeological remains and built heritage resources, arising from the implementation of the proposals, will be identified and appropriately assessed, based on the tables on the following page.

12.21. The significance of effect is assessed with reference to the receptor's (i.e. the heritage asset's) sensitivity and the magnitude of impact.

12.22. The criteria in the table below are based on environmental assessment criteria established by the Design Manual for Roads and Bridges (HA 2020). This is an industry standard assessment methodology, and the only one adopted by a Government agency.

12.23. The attribution of the sensitivity of a heritage asset is a question of professional judgement derived from an assessment its heritage significance. However, in order to bring a degree of objective, procedural rigor into what otherwise might be judged to be 'personal opinion', the sensitivity of the receptor (heritage asset) is defined by its importance in terms of national, regional or local statutory or non-statutory protection and grading of the asset. The non-statutory criteria used by the Secretary of State for scheduled monuments provide relevant criteria to assist this process, as do the Historic England Listing Selection Guides and the DCMS Principles of Selection for Listing Buildings document. The table below sets out the criteria for assessing sensitivity.

Sensitivity of Receptor

Receptor	**Sensitivity of receptor**				
	Very High	High	Medium	Low	Negligible
World Heritage Site					
Scheduled Monument					
Grade I or II* listed building					
Grade I or II* registered park or garden					
Other nationally important archaeological asset					
Grade II listed building					
Grade II registered park or garden					
Conservation area					
Other asset of regional or county importance					
Locally important asset with cultural or educational value					
Heritage site or feature with very limited value or interest					

12.24. The classification of the magnitude of change to heritage assets is rigorous and based on consistent criteria. This will take account of such factors as the physical scale and type of disturbance to them and whether features or evidence would be lost that are fundamental to their heritage interest and therefore significance. The magnitude of

change is assessed using the criteria in the table below.

Magnitude of Change

Magnitude of Change				
Large	Medium	Small	Negligible	None
Change to the significance of a heritage asset so that it is completely altered or destroyed	Change to the significance of a heritage asset so that it is significantly modified	Change to the significance of a heritage asset so that it is noticeably different	Change to the significance of a heritage asset that hardly affects it	No change to the significance of an asset

12.25. Following the evaluation of sensitivity for specific archaeology and cultural heritage receptors and the magnitude of impact, the significance of effect is assessed using the criteria shown in the table below.

Significance Matrix

Magnitude of change	**Sensitivity of receptor**				
	Very High	High	Medium	Low	Negligible
Large	Severe	Major	Moderate	Moderate or Minor	Minor
Medium	Major	Major or Moderate	Moderate or Minor	Minor	Negligible
Small	Moderate	Moderate or Minor	Minor	Negligible	Neutral
Negligible	Moderate or Minor	Minor	Negligible	Neutral	Neutral
None	Neutral	Neutral	Neutral	Neutral	Neutral

12.26. The assessment matrix defined in the table above is not intended to be 'prescriptive', but rather it allows for the employment of professional judgement to determine the most appropriate level of effect for each heritage asset that is identified.

12.27. Effects will be categorised with regard to their nature (adverse, beneficial or neutral) and their permanence (permanent, temporary or reversible). For all forms of heritage asset (receptor); including archaeological sites and remains; historic buildings, places and areas; and historic landscapes; the sensitivity of the receptor will be combined with the predicted magnitude of change to heritage significance to arrive at the significance of effect in EIA terms.

12.28. The combination of sensitivity and magnitude of change is undertaken with reference to the matrix in the above table, with those effects defined as severe or major being deemed 'significant'. All other effects are determined to be 'not significant' in EIA terms.

SCOPE OF ASSESSMENT

12.29. As set out with regard to landscape and visual considerations, visual change through development of the site is predicted to be geographically limited. Therefore a study area of 1km radius measured from the boundaries of the site is considered appropriate to assess the potential for impacts on designated heritage assets through changes to their settings.

12.30. Nonetheless, the assessment will take into account the understanding that the ability to see a proposed development from or in combination with a heritage asset does not necessarily equate to an effect upon that heritage asset. It is a question of whether such intervisibility contributes to their significance. A holistic approach to the setting of heritage assets will therefore be employed, in line with best practice, which considers aspects beyond visual matters to determine the baseline circumstances and the potential effects of the development proposals.

12.31. A 1km radius study area from the boundaries of the site is considered appropriate to inform the baseline assessment of the site's archaeological potential, in terms of non-designated heritage assets, in combination with the results of the programme of archaeological investigations within the site itself.

POTENTIAL EFFECTS AND MITIGATION

12.32. Archaeological resources are susceptible to a range of impacts during development. These relate to works associated with site preparation as well as construction related activities, including:

- Demolition and site clearance activities that disturb archaeological remains;
- Excavation that extends into archaeological sequences, for example deep foundations or basements resulting in the removal of the resource;
- Piling activities resulting in disturbance and fragmentation of the archaeological resource;
- Dewatering activities resulting in desiccation of waterlogged remains and deposits.

12.33. The implications, if any, of these actions will be discussed and significance criteria allocated to any identified impact.

12.34. In terms of the effects on cultural heritage (i.e. built form), the effects of the development can be physical, such as loss or damage to a heritage features, or arise through the effects resulting from change to their setting; i.e. change to the surroundings in which a listed building for example is experienced. This component of the assessment will be cross referenced with the landscape and visual assessment. Any such impacts will be discussed and significance criteria applied.

12.35. Once impacts have been identified, means by which they can be avoided through design will be explored as a priority. If impacts cannot be avoided through design then alternative strategies, which may include site investigation and recording, will be proposed. The residual impacts following the implementation of these measures will then be defined and significance criteria applied.

12.36. In terms of heritage assets within the site, the development proposals have the potential to impact on potential archaeological features and deposits within it. Therefore, it is expected that the effects on any such receptors will require some form of mitigation, either through preservation in situ or by a suitable programme of investigation and recording in advance of development.

12.37. More widely, there is the potential for impacts on designated heritage assets beyond the site through changes to their settings. The assessment work that has been undertaken to date indicates that the only designated heritage assets that have the potential to be affected by the proposed development are the listed buildings at St Frideswide Farm. Although, through the implementation of sensitive masterplanning for the site, including the potential retention and enhancement of existing boundary features, and provision of suitable offsets to the surrounding listed buildings, potential harm to these assets can be avoided or minimised.

12.38. The mitigation strategy implemented to avoid or minimise the potential effects associated with the proposed development in this respect will firstly be implemented through mitigation by design; i.e. the sensitive disposition of elements of the development proposals in the site to minimise effects on these receptors in the wider landscape. Subsequent mitigation through landscaping, will also be employed where necessary to further reduce or limit adverse effects arising through change to the setting of heritage assets.

12.39. In terms of cumulative impacts arising from development of other identified sites, the baseline section will also explain as far as it is known, the scale/extent of other likely development which may add cumulatively to changes to the significance of relevant Archaeology and Cultural Heritage receptors.

13. Population and economic effects

13.1. The assessment will determine the likely significant effects as a result of the proposed development on the existing and future local population. The assessment will include consideration of the likely effects associated with both the construction phase and the 'operational' development, when it is competed and occupied.

13.2. Consideration of demographic changes and economic effects are generally considered to be medium and long term impacts. The demographic context of the surrounding area, sector profile of the local economy, unemployment and general trends in occupational profile, will also be included in the analysis. Where appropriated, measures to bring forward economic and community benefits will be identified.

13.3. There is no overarching guidance that sets out the preferred methodology for assessing likely population and economic impacts and effects of development proposals of this nature. However, several published sources of information will inform key elements of the assessment: those of particular relevance are: the Ward profiles and labour market statistics published by Nomis, CDC and OCC, the Homes and Community Agency's Additionality Guide (2014) and the HCA's Employment Density Guide (2015).

BASELINE ASSESSMENT

Description and key features

13.4. The baseline assessment will set out the current profile of the population living and working in the Cherwell District and North Oxford area, compared to regional and national data for context:

- Population profile, age structure, growth rates;
- Levels of employment activity;
- Average income;
- Qualifications and skills; and
- Relative levels of deprivation.

13.5. Given the proposed residential use, the baseline analysis will also include an assessment of health care infrastructure (e.g. GP surgeries), education infrastructure (early years, primary schools and secondary schools), access and availability of open space.

13.6. Baseline information on the underlying conditions will be taken from a variety of sources, which include: National Census (2011) and other ONS-produced sources; NOMIS labour market statistics; and the supporting documentation for the CDC Local Plan.

METHODOLOGY

13.7. The assessment of effects will focus on the following indicators:

Construction Phase

- Construction related employment including the number of construction jobs directly and indirectly supported through the construction supply chain;
- Number of "induced" jobs supported by onward spending of wages in the economy
- Productivity impacts - as measured by Gross Value Added (GVA); and
- Potential of the development to address the employment needs of people currently unemployed and looking for work in the construction trades.

Operational Phase

- Increased population and labour force;

- Uplift in local incomes and expenditure from the new households (population);
- Fiscal effects such as New Homes Bonus payments and additional Council Tax Revenues;
- Indirect employment and productivity impacts;
- Community facilities including provision of education and health care services;
- Availability and access to open space.

13.8. The level of significance of an effect will be determined through professional judgement of factors including sensitivity of the receptor, the magnitude of the impact (amount of change) and its duration. The sensitivity of affected receptors will be considered on a scale of high, moderate, low or negligible. The table below provides a description indicative of each level of sensitivity.

Scale/value/sensitivity of receptor

Receptor scale / value / sensitivity	Description
High	Receptors with a low ability to absorb change without fundamentally altering present character / receptors of social/economic importance or a policy priority.
Medium	Receptors with a moderate capacity to absorb change without significantly altering present character / receptor has some social/economic value / may be referenced in policy.
Low	Receptors able to absorb change without significantly altering present character / demonstrates an above average social/economic performance relative to comparator areas / may be referenced in policy.
Negligible	Receptors resilient and adaptable to change / has a strong performance relative to comparators / may not appear in policy or be considered a priority.

.Determining the Magnitude of Change

13.9. The magnitude of change has been considered as the change experienced from the baseline conditions at the sensitive receptor and has been considered on a scale of high, moderate, low or negligible. The table below defines the levels of magnitude in more detail.

Magnitude of impact

Magnitude	Description
High	Effect likely to affect large numbers of people and/or businesses over the long term. Likely to be material in the decision-making process.
Medium	Effect likely to affect a moderate number of people and/or businesses over a medium duration. Important, but not likely to be a key influence in decision-making.
Low	Effect likely to affect to a small number of people and/or businesses over a short duration. Maybe a local factor, but unlikely to be key in decision-making.
Negligible	Effect does not result in variation beyond baseline conditions, and is unlikely to measurably affect people and/or businesses.

Duration of Effect

13.10. The duration of effects will be taken into consideration when determining the overall significance of the effects. The following timescales will be used:

- Short term: 0 to 5 years;
- Medium term: 5 to 15 years; and
- Long term: 15 years onwards.

Significance of Effect

13.11. The following table provides the framework by which the overall level of effect can be assessed.

Level of effect

Receptor Sensitivity	Magnitude of Impact			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Negligible
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Very low	Negligible	Negligible	Negligible	Negligible

13.12. The level of effect predicted through this process is then reviewed using professional judgement and modified where considered necessary. For the purposes of the assessment, any effect that is moderate or major is considered to be significant in EIA terms.

14. Climate change

Approach to the consideration of climate change in the assessment

14.1. IEMA guidance - identifies that all GHG emissions resulting from a project might be considered significant. The guidance recommends that a focus on proportionate assessment is important in avoiding undue burden and that EIA should focus on a project's significant impacts.

14.2. Geographical Scope - whilst the project may lead directly or indirectly to avoiding GHG emissions outside the physical boundary of the project, for example, through the reduction in the use of private vehicles, the assessment of climate change has been set at the physical boundary of the proposal.

14.3. Temporal scope - this will relate to the 2080s, i.e., more than 50 years after the scheme is occupied.

14.4. It is proposed that this chapter will summarise the climate change aspects considered in each of the preceding topic chapters. The chapter will set out how the proposal responds to the requirements of relevant local plan policy relating to development and climate change.

14.5. Measures proposed to adapt to, and minimise the effects of, climate change will be highlighted to the extent that it is feasible to do this for an outline planning application. Implementation of the proposed development will take place over several years. Over this period, it is inevitable that changes in policy requirements will occur, the decarbonisation of electricity generation will advance further, and new technical measures will be introduced to reduce the energy requirements of buildings and optimise how people use them. Climate change adaptation is required to be informed and flexible: detailed responses will therefore be specified progressively as is appropriate at the time of each reserved matters approval.

15. ES structure

15.1. The EIA will be compiled into an ES document which will be produced in accordance with the 2017 EIA Regulations, and will comprise three main components.

VOLUME 1: ENVIRONMENTAL STATEMENT – TEXT AND FIGURES

- Chapter 1 Introduction
- Chapter 2 Site description
- Chapter 3 Scheme description, design iterations and mitigation
- Chapter 4 Approach to assessment, scoping, alternatives
- Chapter 5 Traffic, transport and movement
- Chapter 6 Air quality
- Chapter 7 Noise and vibration
- Chapter 8 Water resources (drainage and flood risk)
- Chapter 9 Biodiversity
- Chapter 10 Landscape effects and visual amenity
- Chapter 11 Heritage
- Chapter 12 Population and economic effects
- Chapter 13 Climate change
- Chapter 14 Summary of mitigation, residual and interaction effects

VOLUME 2: TECHNICAL APPENDICES

- Supporting technical information for the assessment chapters.

NON-TECHNICAL SUMMARY

16. Appendix 1: Site Location Plan

Water Eaton
Park and Ride

Golf Course

Earthwork

Tumuli

St Frideswide Farm

Cutteslowe

Cutteslowe Park

Site Boundary

Land East of Oxford Road

on behalf of Christ Church & the Trustees of the Water Eaton Estate.

drawing no.	SK129	drawing	Site Boundary Plan		
revision	A	drawn by	CS	job no.	-
scale	1:10,000 @ A3	checked by	NS	date	07 April 2021

N

URBAN DESIGN savills

17. Appendix 2: ALC classification plan

Key:

Site Location Plan

ALC Classifications

- Grade 2
- Subgrade 3a
- Subgrade 3b
- Non Agricultural

Information sourced from "SOILS AND AGRICULTURAL QUALITY OF LAND AT CUTTESLOWE, OXFORDSHIRE"

Report: 1385/1

Report date: 19/02/2018

Author: Land Research Associates (L. Thomas MSc)

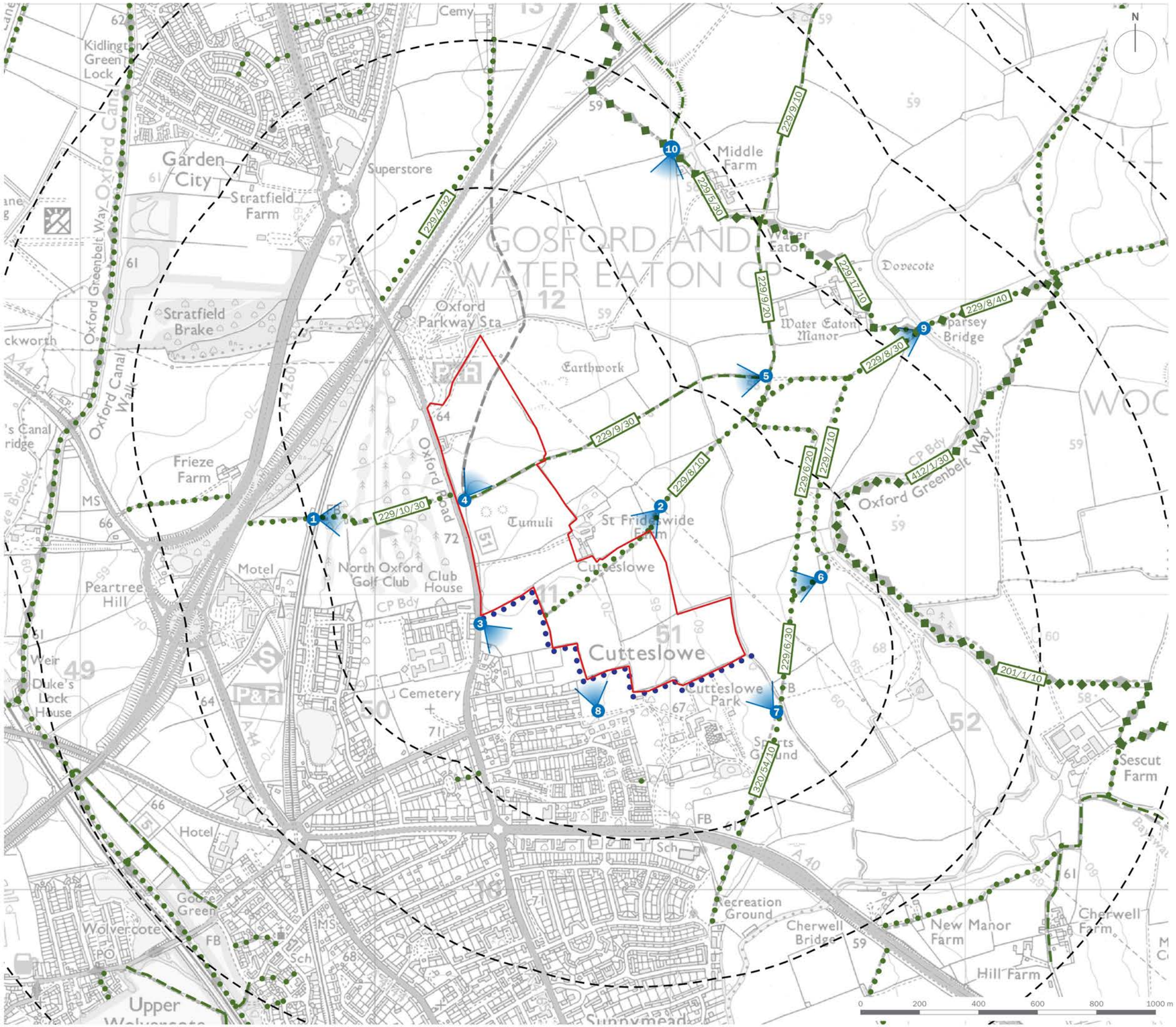
Agricultural Land Classification Map

Ref:	WIPL-477898-PR6a	Date:	08-04-2021
Paper size:	A3	Scale:	1:5,000
Drawn by: Rhys Williams			
Approved by: Peter Traves			

Wessex House
Priors Walk
Wimborne
BH21 1PB
savills.co.uk/planning

0 100 200 300 400 500 m

18. Appendix 3: Proposed LVIA viewpoint locations plan



Legal changes made to the network and the Definitive Map since 2006 (as shown on the online Countryside Access Map at www.oxfordshire.gov.uk on 19.12.17)

client

Christ Church and The Water Eaton Estate

project title

Land East of Oxford Road

drawing title

Viewpoint Location Plan

date	**15 APRIL 2021**	drawn by	**GY**
drawing number	**edp5650_d002**	checked	**BC**
scale	**1:12,500 @ A3**	QA	**RB**

the environmental dimension partnership

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19. Appendix 4: LVIA Assessment Methodology

INTRODUCTION

19.1. The development proposed falls within the requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. This report therefore constitutes a full Landscape and Visual Impact Assessment (LVIA) of the proposed development of the site.

19.2. The assessment methodology for assessing landscape and visual effects prepared by EDP is based on the following best practice guidance:

- Guidelines for Landscape and Visual Impact Assessment (GLVIA) – Third Edition (LI/IEMA 2013);
- An Approach to Landscape Character Assessment (Natural England 2014);
- Landscape Character Assessment – Guidance for England and Scotland (Swanick & LUC 2002) produced on behalf of the Countryside Agency and Scottish Natural Heritage; and
- Landscape Institute Technical Guidance Note (TNG) 06/19 Visual Representation of Development Proposals (17 September 2019).

19.3. Landscape assessment is concerned with the changes in the physical landscape in terms of features/elements that may give rise to changes in the character of the landscape. Visual appraisal is concerned with the changes that arise in the composition of available views as a result of changes to the landscape, people's responses to the changes and to the overall effects on visual amenity. Changes may result in adverse (negative), beneficial (positive) or neutral effects.

19.4. The nature of landscape and visual assessment requires both objective analysis and subjective professional judgement. Accordingly, the following assessment is based on the best practice guidance listed above, information and data analysis techniques, uses subjective professional judgement and quantifiable factors wherever possible, and is based on clearly defined terms.

19.5. The characteristics of the development and the nature of landscape and visual effects arising will vary throughout the different phases of the lifecycle of the project. LVIA undertaken as part of an Environmental Impact Assessment (EIA) is required to include an assessment of effects at different stages of the life-cycle of the development, and commonly includes:

- Construction effects; and
- Operational Effects (often including Year 1 and Year 15 effects such that mitigation is considered).

19.6. Year 1 considers the effects of the development upon completion of the construction phase. The assessment of landscape and visual effects at Year 15 takes into account any proposed mitigation measures, including structural or developmental planting. The assessment undertaken at Year 15 assumes that such proposals have the opportunity to grow and become effective. For the purposes of most LVIAs Year 15 effects are also taken to be the 'residual effects' of the development. Residual effects are those which are likely to remain on completion of the development and are to be given the greatest weight in planning terms.

19.7. In some cases, the scope of the EIA also requires the assessment of effects during decommissioning and restoration; an assessment of these effects is included in the LVIA when requested or required.

19.8. The need for the consideration of cumulative effects is agreed as part of the EIA scoping process. Cumulative effects are considered in further detail below.

CURRENT GUIDANCE AND THE ASSESSMENT PROCESS

19.9. The GLVIA presents guidelines for undertaking the assessment process using a non-prescriptive methodology. As stated at paragraph 1.20 of the GLVIA:

19.10. "The guidance concentrates on principles while also seeking to steer specific approaches where there is a general consensus on methods and techniques. It is not intended to be prescriptive, in that it does not follow a detailed 'recipe' that can be followed in every situation. It is always the primary responsibility of any landscape professional carrying out an assessment to ensure that the approach and methodology adopted are appropriate to the particular circumstances."

19.11. The summary following paragraph 3.45 of the GLVIA sets out the advice on good practice to be followed in undertaking the assessment and includes the following points:

- "Assessing the significance of landscape and visual effects is a matter of judgement. It is vital that the basis of such judgements is transparent and understandable, so that the underlying assumptions and reasoning can be examined by others;
- A step-by step approach should be taken to make judgements of significance, combining judgements about the nature of the receptor, summarised as its sensitivity, and the nature of the effect, summarised as its magnitude;
- The contribution of judgements about the individual criteria contributing to the sensitivity and magnitude should be clear, and the approach to combining all the judgements to reach an overall judgement of significance should be transparent as possible;
- LVIAs should always distinguish clearly between what are considered to be the significant and non-significant effects; and
- To ensure that the reasoning behind the judgements is clear there should be more emphasis on narrative text describing the landscape and visual effects and the judgements made about their significance, with tables and matrices used to support and summarise the descriptive text, not to replace it. The key issues must be made clear."

19.12. This assessment is considered to comply with the general principles of good practice in the GLVIA 3rd edition as set out above.

19.13. The assessment involves information review, consultations, fieldwork observations and photography, computer-based data processing and analysis, and subjective professional judgement. It is an iterative process, and involves up to nine main stages, and is tailored in terms of its proportionality to the size and scale of the development proposed, and its location:

- Stage 1: Review the development proposals: to understand the nature of the development proposals in respect of potential landscape and visual effects to inform the extent of the study area and the baseline assessment;
- Stage 2: Landscape baseline assessment: an analysis of the characterisation and evaluation of the existing landscape baseline, in respect of its value. This analysis is aided where possible by available published landscape character assessment;
- Stage 3: Visual baseline assessment: establish the zone of visual influence of the proposals including, where appropriate, the use of computer-generated zones of theoretical visibility, based on topographical data only, and through fieldwork analysis. This establishes the locations where views of the development may be available. Fieldwork and data trawl information review to establish the types and locations of receptors within this theoretical zone;

- Stage 4: Viewpoint selection: selection of viewpoints to represent the various receptor types in the study area. Locations are agreed with the Local Planning Authority (where practical) and any other relevant statutory consultees, where possible;
- Stage 5: Mitigation: commentary on the input provided into the iterative design process, where appropriate, to avoid, reduce or compensate for potential effects on the landscape and visual receptors identified;
- Stage 6: Landscape assessment: an assessment to identify the potential residual effects on landscape fabric, the character of the landscape units and the special characteristics and purposes of any landscape designations;
- Stage 7: Visual assessment: an assessment of the potential residual effects upon visual amenity at the selected visual receptor locations identified within the study area;
- Stage 8: Judgement of landscape capacity: a discussion about the ability of the landscape to accommodate the changes proposed; and
- Stage 9: Cumulative effects assessment: the assessment of the development proposals in conjunction with other known proposals which have not been implemented but may have planning permission, are awaiting determination or other proposals identified as requiring inclusion in the cumulative effects assessment.

19.14. Each of these key stages is described in more detail below, with reference to the GLVIA 3rd Edition.

STAGE 1: REVIEW OF DEVELOPMENT PROPOSALS AND DEFINING THE STUDY AREA(S)

19.15. Study areas are defined in accordance with the EIA Regulations 2017, which require an assessment to be made which provides 'a description of the aspects of the environment likely to be significantly affected by the development'19. Guidance contained within the GLVIA 3rd edition is also pertinent, with this document advising that the study area for landscape and visual assessment should cover the following:

Landscape (paragraph 5.2 of the GLVIA)
"Scoping should also identify the area of landscape that needs to be covered in assessing landscape effects. This should be agreed with the competent authority, but it should also be recognised that it may change as the work progresses, for example as a result of fieldwork, or changes to a proposal. The study area should include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner."

Visual (paragraph 6.2 of the GLVIA)
"Scoping should identify the area that needs to be covered in assessing visual effects, the range of people who may be affected by these effects and the related viewpoints in the study area that will need to be examined. The study area should be agreed with the competent authority at the outset and should consider the area from which the proposed development will potentially be visible. The emphasis must be on a reasonable approach which is proportional to the scale and nature of the proposed development. At the scoping stage the study area will only be defined in a preliminary way and is likely to be modified as more detailed analysis is carried out, in discussion with the competent authority."

19.16. It is therefore imperative that an understanding of the development proposed, its scale, character and geographical extents is required to be able to define the study area.

19 Schedule 4, Part 1, clause 3, DETR 2011

STAGES 2 AND 3: ESTABLISHING THE LANDSCAPE AND VISUAL BASELINE

19.17. The purpose of baseline studies is to record and analyse the existing landscape features, characteristics, the way in which the landscape is experienced and the value or importance of the landscape and visual resource in the study area. The third edition of the GLVIA sets out guidance in relation the landscape baseline at paragraph 5.3:

"Baseline studies for assessing landscape effects require a mix of desk study and field work to identify and record the character of the landscape and the elements, features and aesthetic and perceptual factors which contribute to it. They should also deal with the value attached to the landscape (see paragraph 5.19). The methods used should be appropriate to the context into which the development proposal will be introduced and in line with current guidance and terminology."

19.18. As set out above, it is also a requirement of the baseline stage to establish the value of the landscape receptors identified:

"As part of the baseline description the value of the potentially affected landscape should be established. This means the relative value that is attached to different landscapes by society, bearing in mind that a landscape may be valued by different stakeholders for a whole variety of reasons. Considering value at the baseline stage will inform later judgements about the significance of effects. Value can apply to areas of landscape as a whole, or to the individual elements, features and aesthetic or perceptual dimensions which contribute to the character of the landscape…"

STAGE 4: VIEWPOINT ANALYSIS

19.19. To aid the assessment of landscape and in particular visual, receptors, a number of representative viewpoints have been visited, photographed and assessed. These have been identified following analysis of the potential visual influence of the proposals, site survey and liaison with the local authority. The final selection of viewpoints have been selected taking account of the following:

- The accessibility to the public;
- The potential number and sensitivity of viewers who may be affected;
- The viewing direction and/or distance;
- The nature of the viewing experience;
- The type and extent of view; and
- The potential for cumulative views.

19.20. The viewpoints selected include a variety of public viewpoints (with public access), transport routes, areas of landscape designation and landscape character areas. In no instance (unless specifically stated) have private views been included.

19.21. The Landscape Institutes (LI) guidance note (TGN 06-19) recommends that practitioners should justify their approach and utilise a methodology appropriate to the project. A good understanding of the options and early engagement with regulatory authorities can ensure that visualisations are prepared to an appropriate standard. The use of full frame sensor Digital Single-Lens Reflex (SLR) cameras is recommended for all visualisation types. The use of fixed focal length lenses of 50mm, 35mm/28mm, is also required to meet the guidance. Full-Frame Sensor (FFS) 50mm lenses should be used wherever possible. A good quality tripod is also recommended, together with panoramic head and leveller if Type 4 verified panoramic visualisations are to be prepared.

19.22. The guidance defines the preparation of different types of technical visualisations in a table, which are prepared as part of different planning applications. The guidance defines four main types of visualisation, and although there

can be some overlap, these are:

- Type 1: Annotated Viewpoint Photographs (LVAs and LVIAs etc.);
- Type 2: 3D Wireline / 3D Model (including Dynamic Visualisations; Augmented and Virtual Reality);
- Type 3: Photomontage / Photo-wire (not survey scale verifiable); and
- Type 4: Photomontage / Photo-wire (survey/scale verifiable).

19.23. Where Type 3 and Type 4 photomontages or 'verified' views are presented in the assessment, the methodology for their production is provided separately.

STAGE 5: MITIGATION

19.24. Mitigation measures seek to avoid, reduce or compensate for adverse landscape or visual effects resulting from the development proposals. Mitigation measures are considered under two categories:

- Primary, or embedded, mitigation measures are those that are intrinsically part of the development proposals, such as the height, scale, massing, orientation and location of development, the nature of materials used or retention of existing 'inherent' landscape features; and
- Secondary, or reduction, mitigation measures are designed to address remaining adverse effects (both significant and non-significant effects), and include proposals such as areas of new planting to filter views towards the development or new hedgerows to compensate for those lost.

19.25. Recommendations for mitigation and enhancement measures are fed into the design process following the baseline studies and the identification of landscape and visual receptors. This early stage involvement of the landscape practitioner ensures that the proposals which come forward have taken account of the most important landscape and/or visual constraints within the wider landscape.

19.26. Enhancement is a separate issue to mitigation and involves the identification of measures which can positively contribute to the landscape or to visual amenity. For example, restoring or reconstructing local landscape character, improving the management of new and existing landscape fabric or the removal of landscape detractors.

STAGE 6: LANDSCAPE ASSESSMENT

19.27. The assessment of effects on landscape draws on the description of the development, the landscape context and the visibility and viewpoint analysis, and considers whether the proposed development is likely to have a significant beneficial or adverse effect on landscape fabric, the character of the landscape units and the special characteristics of any landscape designations in the study area such that their ability to fulfil their purposes is likely to be compromised.

Effects on Landscape Fabric

19.28. Landscape fabric is composed of the physical components of the landscape. Developments can bring about both direct and indirect effects on landscape fabric. Direct effects occur where changes to the fabric of the landscape arise as the result of physical disturbance; for example, the loss of landscape elements such as hedgerows, walls and trees. Indirect effects are consequential changes that are separated from the source of the change in a temporal or spatial manner; for example changes in vegetation downstream as the result of modifications to surface water patterns in a catchment area.

19.29. The assessment of effects on landscape fabric considers the existing landscape fabric of the site and the predicted losses and gains to landscape fabric as a result of the development, and makes a judgement as to whether there is likely to be a significant beneficial, adverse or neutral change to landscape fabric.

19.30. Significant beneficial effects on landscape fabric could occur where important/mature/diverse/distinctive

components, which had previously been lost or degraded as the result of agricultural operations or other development, will be added, reinstated or improved. Significant adverse effects on landscape fabric could occur where important/mature/diverse/distinctive components will be permanently lost and the effect cannot be adequately mitigated.

Effects on Landscape Character

19.31. In order to reach an understanding of the effects of development on landscape character, it is necessary to consider the different aspects of the landscape, and how these interact to create landscape character. These aspects are as follows:

- Elements: The individual elements that make up the landscape, including prominent or eye-catching features such as hills, valleys, woods, trees and hedges, ponds, buildings and roads. They are generally quantifiable and can be easily described;
- Characteristics: Elements or combinations of elements that make up a particular contribution to the character of an area, including experiential characteristics such as tranquillity and wildness; and
- Character: The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape. Character is identified through the process of characterisation, which evaluates the landscape as a resource in its own right and identifies geographical areas of similar character.

Assessment of Landscape Effects

19.32. The assessment of effects includes a combination of objective and subjective judgements. The development proposals are assessed against the baseline information to enable an evaluation of the effects that would occur upon the existing landscape resource.

19.33. Typically, the landscape receptors identified in the assessment are likely to include:

- Site landscape fabric;
- The landscape character of the site and local context through an assessment of the effects of the proposals on the key characteristics of the landscape identified in the baseline assessment and site visit;
- The 'host' character of the landscape character area/unit in the published landscape character assessment;
- Non-host' landscape character areas surrounding the host character area and may be affected by the proposals (where relevant); and
- The character of any local or national landscape designations (where relevant) through an assessment of the likely effects on the published key characteristics or special qualities.

19.34. The landscape effects are defined as the result of the interaction between the sensitivity of the landscape receptor and the magnitude of change predicted for that receptor.

Sensitivity of the Landscape Resource

19.35. A number of factors influence professional judgement when assessing the degree to which a particular landscape receptor can accommodate change arising from a particular development. Sensitivity is made up of judgements about the value attached to the receptor determined at baseline stage (paragraph 5.19 of the GLVIA) and the susceptibility of the receptor to the type of change arising from the development proposal.

19.36. A location may have different levels of sensitivity according to the types of receptors at that location and any one receptor type may be accorded different levels of sensitivity at different locations e.g. due to differences in value

or susceptibility to change.

Susceptibility to Change for Landscape Receptors

19.37. The susceptibility of a landscape receptor relates to the ability of the receptor to accommodate the proposed development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies as defined within the Local Development Plan or landscape character assessments.

19.38. It is important when considering susceptibility that heed is taken of the type of development proposed i.e. intrinsic or inherent sensitivity (such as is commonly indicated within published sensitivity in capacity assessments) cannot reliably inform the identification of susceptibility as they are carried out without any reference to the particular type of development proposed. Judgements about the susceptibility of landscape receptors within this assessment are provided on a verbal scale as indicated in the table below.

Susceptibility to Change Criteria for Landscape Receptors

Category	Landscape Receptor Criteria
Very High	Strong/distinctive landscape elements/aesthetic/perceptual aspects; absence of landscape detractors; landscape receptors in excellent condition. Landscapes with clear and widely recognised cultural value. Landscapes with a high level of tranquillity.
High	Many distinctive landscape elements/aesthetic/perceptual aspects; very few landscape detractors; landscape receptors in good condition. The landscape has a low capacity for change as a result of potential changes to defining character.
Medium	Some distinctive landscape elements/aesthetic/perceptual aspects; few landscape detractors; landscape receptors in fair condition. Landscape is able to accommodate some change as a result.
Low	Few distinctive landscape elements/aesthetic/perceptual aspects; presence of landscape detractors; landscape receptors in poor condition. Landscape is able to accommodate large amounts of change without changing these characteristics fundamentally.
Very Low	Absence of distinctive landscape elements/aesthetic/perceptual aspects; presence of many landscape detractors; landscape receptors in very poor condition. As such landscape is able to accommodate considerable change.

Value of Landscape Receptors

19.39. The value attached to the landscape receptors within the assessment will cover the following:

- The value of the landscape character types or areas that might be affected by the development, based upon review of any designation s at both national and local levels, and, where there are no designations, judgements based on criteria that can be used to establish landscape value; and
- The value of individual contributors to landscape character, especially the key characteristics, which may include individual elements of the landscape, in particular landscape features, notable aesthetic, perceptual or experiential qualities, and combinations of these contributors.

19.40. The potential information/designations that will contribute to understanding value is summarised below, with reference to paragraph 5.20 of the GLVIA:

- Statutory designations e.g. National Parks, National Scenic Areas, Areas of Outstanding Natural Beauty;
- Heritage Coasts;

- Conservation areas, listed buildings, Tree Preservation Orders, important hedgerows, scheduled monuments, historic gardens and battlefields;
- Local landscape designations in Development Plans;
- Local/community interests e.g. local green spaces, village greens and allotments; and
- Art and literature including e.g. tourism literature or specially promoted views.

19.41. In the absence of existing evidence to indicate value, it is advised that new survey and analysis may be needed to establish landscape value. The range of factors that can help in the identification of valued landscape are listed at paragraph 5.28 of the GLVIA and summarised below and defined in the glossary:

- Landscape condition/quality;
- Scenic quality;
- Rarity;
- Representativeness;
- Conservation Interests;
- Recreational value;
- Perceptual aspects e.g. wildness and/or tranquillity; and
- Associations.

19.42. The table below provides an indication of the criteria by which the value of a landscape receptor is judged within this assessment.

Landscape Value Criteria for Landscape Receptors

Category	Landscape Receptor Criteria
Very High	Nationally/Internationally designated/valued countryside and landscape features; strong/distinctive landscape characteristics; absence of landscape detractors.
High	Locally designated/valued countryside (e.g. Areas of High Landscape Value, Regional Scenic Areas) and landscape features; many distinctive landscape characteristics; very few landscape detractors.
Medium	Undesignated countryside and landscape features; some distinctive landscape characteristics; few landscape detractors.
Low	Undesignated countryside and landscape features; few distinctive landscape characteristics; presence of landscape detractors.
Very Low	Undesignated countryside and landscape features; absence of distinctive landscape characteristics; despoiled / degraded by the presence of many landscape detractors.

19.43. It is important to note that there can be complex relationships between landscape value and susceptibility to change, which are particularly important when considering development proposals near to designated landscapes. For example, an internationally, nationally or locally designated landscape does not automatically, or by definition, have high susceptibility to all types of change. Designated landscapes, by virtue of the characteristics of the landscape and/or the nature of the proposal, can have a low susceptibility to change.

Defining Overall Sensitivity

19.44. The overall sensitivity of any landscape receptor is determined by combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape as set out at paragraph 5.39 of GLVIA 3rd Edition (2013). For example a high susceptibility to change and a low value may result in a medium overall sensitivity. A degree of professional judgement will always apply in arriving at the overall sensitivity for landscape receptors, and a five point word scale is used to define this – Very High, High, Medium, Low and Very

Low – this reflecting the definition used for value and susceptibility individually.

Magnitude of Change

19.45. The magnitude of change is determined through a range of considerations particular to each effect receptor and effect. In line with the GLVIA, the three main attributes considered are:

- Scale of Change
- Geographical Extent; and
- Duration and Reversibility.

19.46. Scale of Change: The considerations set out at paragraph 5.49 of the GLVIA are summarised as follows:

- The extent of any existing landscape fabric elements lost including the proportion of the total extent that this represents and the contribution of that element to the character of the landscape;
- The degree to which aesthetic or perceptual aspects of the landscape are altered by removal of features e.g. hedgerows and/or the introduction of new features e.g. buildings; and
- Consideration of whether the effect changes the key characteristics of the landscape which are critical to its distinctive character.

19.47. The table below provides an indication of the criteria by which the size/scale of change at a landscape receptor is judged within this assessment.

Scale of Change Criteria for Landscape Receptors

Category	Landscape Receptor Criteria
Very High	Total loss of or major alteration to key elements/features/characteristics of the baseline condition. Addition of elements which strongly conflict with the key characteristics of the existing landscape.
High	Notable loss or alteration to one or more key elements/features/characteristics of the baseline condition. Addition of elements that are prominent and may conflict with the key characteristics of the existing landscape.
Medium	Partial loss or alteration to one or more key elements/features/characteristics of the baseline condition. Addition of elements that may be evident but do not necessarily conflict with the key characteristics of the existing landscape.
Low	Minor loss or alteration to one or more key elements/features/characteristics of the baseline landscape. Addition of elements that may not be uncharacteristic within the existing landscape.
Very Low	Barely discernible loss or alteration to key elements/features/characteristics of the baseline landscape. Addition of elements not uncharacteristic within the existing landscape.

19.48. Geographical Extent: This is distinct from the size or scale of effect and a range of scales that typically apply are listed below:

- Large scale effects influencing several landscape types or character areas;
- Effects at the scale of the landscape type or character areas within which the proposal lies;
- Effects within the immediate landscape setting of the site;
- Effects at the site level (within the development site itself); and
- Effects only experienced on parts of the site at a very localised level.

19.49. The table below provides an indication of the criteria by which the geographical extent of the area will be affected within this assessment for landscape receptors.

Geographical Extent Criteria for Landscape Receptors

Landscape Receptors
Large scale effects influencing several landscape types or character areas
Effects at the scale of the landscape type or character areas within which the proposal lies
Effects within the immediate landscape setting of the site
Effects at the site level (within the development site itself)
Effects only experienced on parts of the site at a very localised level

19.50. Duration and reversibility are separate but linked considerations. Duration is judged according to the defined terms set out in below. Reversibility is a judgement about the prospects and practicality of the particular effect being reversed in, for example, a generation. The categories used in this assessment are set out below.

Duration:

- Long term (20 years+);
- Medium to long term (10 to 20 years);
- Medium term (5 to 10 years);
- Short term (1 year to 5 years); and
- Temporary (less than 12 months).

Reversibility:

- Permanent with unlikely restoration to original state e.g. major road corridor, power station, urban extension etc.;
- Permanent with possible conversion to original state e.g. agricultural buildings, retail units;
- Partially reversible to a different state e.g. mineral workings;
- Reversible after decommissioning to a similar original state e.g. wind energy development; and
- Quickly reversible e.g. temporary structures.

Defining Overall Magnitude of Change

19.51. The overall magnitude of change experienced by landscape receptor is determined by combining judgements of their scale of change, the geographical extent of any change and the duration and/or reversibility of that change. For example a high scale of change experienced for a short period and over a small geographical extent may result in a medium overall magnitude of change. A degree of professional judgement will always apply in arriving at the overall magnitude of change for landscape receptors, and a five point word scale is used to define this – Very High, High, Medium, Low and Very Low – this reflecting the definition used for scale of change.

Defining Landscape Effects

19.52. To define the significance of an effect, the separate judgements about the sensitivity of the receptors and the magnitude of change at those receptors need to be combined to allow a final judgement to be made about whether each effect is significant in terms of the EIA Regulations, or not. This is undertaken within this assessment, in the first instance, using a matrix which combines the two facets to determine a level of effect. Further professional judgement is applied, relevant to the development and its location, to finalise the level of effects and thus its significance.

STAGE 7: ASSESSMENT OF VISUAL EFFECTS

19.53. The visual amenity assessment is often informed by the preparation of a Zone of Theoretical Visibility (ZTV) using a Geographical Information System (GIS). This typically uses only landform data (of various resolutions) to assess the theoretical visibility of the development proposals. In reality, vegetation and built form substantially reduce the locations from where the proposals are visible; however the ZTV is a useful starting point to inform the field assessment.

19.54. The field assessment identifies locations and routes from where the proposals can be seen, taking into account the effects of built form and vegetation to establish the primary zone of visibility. The assessment may consider 'average' conditions and 'worst-case' conditions, the latter being when leaf-cover is minimal. Where visual assessments cannot be undertaken in the winter months due to the project programme, the assessment will state any limitations this is considered to have on the certainty with which the assessment can be undertaken.

19.55. The assessment of effects is aided through consideration of a representative selection of viewpoints from where principal receptors may obtain clear views of the proposed development. The viewpoints selected typically represent specific locations from where the maximum visibility of the proposals is available in the local area. As a result of the selection of only viewpoints in which the proposed development will be visible and those where it is most conspicuous, there will be a tendency to overstate the true extent of visibility of the development and its effects on visual amenity.

Identifying Visual Receptors

19.56. The locations and types of visual receptors within the defined study areas are identified from Ordnance Survey maps and other published information (such as walking guides), from fieldwork observations and from information provided during the consultation process.

19.57. The selected viewpoints provided within the report will be agreed through consultation with the Local Planning Authority, where possible and practical. They will illustrate clear views of the development from locations within the study area which typically cover a range of:

- Designated landscapes (where present);
- Landscape character areas/ types;
- Distances and orientations from the proposals; and
- Receptor types.

19.58. A typical range of receptors and the locations and activities that they may be undertaking is provided in the table below. As shown, these are grouped into primarily two, but sometimes three, main receptor groups (zonal, linear route and marine-based receptors) whose location and activities influence the way that they experience the landscape and views.

Typical Visual Receptors

	Receptor type	Typical Locations	Activities
Zonal	Residents	Residential properties, farmsteads, settlements and towns	Enjoying views from within the curtilage of their properties, from windows, driveways and gardens
	Walkers, cyclists, horse riders	Open access areas	For exercise and to enjoy the landscape and views
	Motorists, walkers, cyclists and horse riders	Scenic vantage points	Stopping a journey to enjoy the view
	People at leisure (outdoors) e.g. golfers, fishermen, campers, bathers	Golf courses, fishing lakes, recreational grounds, picnic sites, camping and caravan sites, holiday villages	Playing golf, fishing or other outdoor sports, picnicking, camping and caravan holidays
	People at work (outdoors)	Farms, mineral extraction sites, waste disposal sites	Working but with views of surroundings
	People at leisure (indoors)	Indoor recreational centres, cinemas	Indoor sports and leisure activities with few views of surroundings
	People at work (indoors)	Offices, business parks, industrial estates	Working with few views of surroundings
	Ferry, rail and air travellers	At ferry terminals, railway stations and airports	Waiting to catch their chosen mode of transport
Linear	Walkers, cyclists and horse riders	On footpaths, cycle routes, bridleways and other public rights of way	Travelling at a steady pace with ample opportunity to enjoy the specific qualities of the landscape
	Motorcyclists, motorists and passengers	On motorways, A- B class roads, minor roads and tracks	Travelling at various speeds, depending on the class of road and driver, with views of surroundings
	Rail and air travellers	On trains and aeroplanes	Travelling at various speeds and with various views
Marine-based	Recreational water users, e.g. swimmers, surfers, sailors	Moving around the inshore waters	Swimming, surfing, skiing, sailing, fishing, with views
	Passengers, e.g. ferry & cruise ships	On ferry and shipping routes	Passage-making, with views
	Commercial shipping and fishing	On shipping routes	Passage-making, limited views

Visual Receptor Sensitivity

19.59. Factors which influence professional judgment when assessing the degree to which a particular view can accommodate change arising from a particular development, without detrimental effects would typically include judgements about the susceptibility of visual receptors to change and the value attached to views.

19.60. Judgements of susceptibility of visual receptors to change is mainly a function of the occupation or activity of people experiencing the view at particular locations; and the extent to which their attention or interest may therefore be focussed on the views and the visual amenity they experience at particular locations.

19.61. Judgements of value attached to views take into account recognition of the value attached to particular views e.g. heritage assets or through planning designations and indicators of the value attached to views by visitors e.g.

guidebooks, tourists maps and interpretative material.

19.62. The table below provides an indication of the criteria by which both the susceptibility and value are combined to define the overall sensitivity of visual receptors:

Overall Sensitivity Criteria for Visual Receptors

Category	Visual Receptor Criteria
Very High	Designed view (which may be to or from a recognised heritage asset or other important viewpoint), or where views of the surroundings are an important contributor to the experience. Key promoted viewpoint e.g. interpretative signs. References in literature and art and/or guidebooks tourist maps. Protected view recognised in planning policy designation. Examples may include views from residential properties, especially from rooms normally occupied in waking or daylight hours; national public rights of way e.g. National Trails and nationally designated countryside/landscape features with public access which people might visit purely to experience the view; and visitors to heritage assets of national importance.
High	View of clear value but may not be formally recognised e.g. framed view of high scenic value, or destination hill summits. It may also be inferred that the view is likely to have value e.g. to local residents. Examples may include views from recreational receptors where there is some appreciation of the landscape e.g. golf and fishing; local public rights of way, access land and National Trust land, also panoramic viewpoints marked on maps; road routes promoted in tourist guides for their scenic value.
Medium	View is not promoted or recorded in any published sources and may be typical of the views experienced from a given receptor. Examples may include people engaged in outdoor sport other than appreciation of the landscape e.g. football and rugby or road users on minor routes passing through rural or scenic areas.
Low	View of clearly lesser value than similar views experienced from nearby visual receptors that may be more accessible. Examples may include road users on main road routes (motorways/A roads) and users of rail routes or people at their place of work (where the place of work may be in a sensitive location). Also views from commercial buildings where views of the surrounding landscape may have some limited importance.
Very Low	View affected by many landscape detractors and unlikely to be valued. Examples may include people at their place of work, indoor recreational or leisure facilities or other locations where views of the wider landscape have little or no importance.

Magnitude of Change

19.63. The magnitude of the change to a view is a judgement based on a series of parameters, listed below. A professional judgement of the magnitude of change is reached by fieldwork observation, which can be supported by cross sections and computer-generated visualisations and/or 3D models, where appropriate. Magnitude is determined by evaluating the following parameters:

- Size or scale, taking into account change with respect to loss or additions of features in the view and changes in its composition, including the proportion of the view occupied by the proposals. In addition the degree of contrast or integration with any new features or changes in the landscape in terms of form, scale and mass, line, height, colour and texture are considered. Finally the nature of the view is considered e.g. full, partial or glimpsed;

- Geographical extent will vary with different viewpoints and is likely to reflect the angle of view in relation to the main activity of the receptor; the distance of the viewpoint from the proposed development and the extent of the area over which the changes would be visible; and
- Duration and reversibility of visual effects as set out for the landscape effects above.

19.64. For the visual receptors identified, the factors above are examined independently and the findings judged in accordance with the indicative categories below in the tables.

Scale of Change Criteria for Visual Receptors

Category	Visual Receptor Criteria
Very High	There would be a substantial change to the baseline, with the proposed development creating a new focus and having a defining influence on the view.
High	The proposed development will be clearly noticeable and the view would be fundamentally altered by its presence.
Medium	The proposed development will form a new and recognisable element within the view which is likely to be recognised by the receptor.
Low	The proposed development will form a minor constituent of the view being partially visible or at sufficient distance to be a small component.
Very Low	The proposed development will form a barely noticeable component of the view, and the view whilst slightly altered would be similar to the baseline situation.

19.65. The table below provides an indication of the criteria by which the geographical extent of the area will be affected within this assessment.

Geographical Extent Criteria for Visual Receptors

Visual Receptor Criteria
Direct views at close range with changes over a wide horizontal and vertical extent.
Direct or oblique views at close range with changes over a notable horizontal and/or vertical extent.
Direct or oblique views at medium range with a moderate horizontal and/or vertical extent of the view affected.
Oblique views at medium or long range with a small horizontal/vertical extent of the view affected.
Long range views with a negligible part of the view affected.

Defining Visual Effects

19.66. The assessment of effects on visual amenity draws on the predicted effects of the development, the landscape and visual context, and the visibility and viewpoint analyses, and considers the significance of the overall effects of the proposed development on the visual amenity of the main visual receptor types in the study area.

19.67. To define the significance of an effect, the separate judgements about the sensitivity of the receptors and the magnitude of change at those receptors need to be combined to allow a final judgement to be made about whether each effect is significant in terms of the EIA Regulations, or not. This is undertaken within this assessment, in the first instance, using a matrix which combines the two facets to determine a level of effect. Further professional judgement is applied, relevant to the development and its location, to finalise the level of effects and thus its significance.

STAGE 6, 7 AND 8: SIGNIFICANCE OF LANDSCAPE AND VISUAL EFFECTS

19.68. The purpose of the assessment process is to identify the significant environmental effects (both beneficial and adverse) of the development proposals. For proposals subject to a full EIA, Schedule 4 to the EIA Regulations specifies the information to be included in all environmental statements, which should include a description of:

"The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development."

19.69. In order to consider the likely significance of any effect, the sensitivity of each receptor is combined with the predicted magnitude of change to determine the significance of effect, with reference also made to the geographical extent, duration and reversibility of the effect within the assessment. Having taken such a wide range of factors into account when assessing sensitivity and magnitude at each receptor, the significance of effect can be derived by combining the sensitivity and magnitude in accordance with the matrix in the table below.

Significance Matrix for Landscape and Visual Effects

Overall Sensitivity	Overall Magnitude of Change				
	Very High	High	Medium	Low	Very Low
Very High	Substantial	Major	Major/ Moderate	Moderate	Moderate/ Minor
High	Major	Major/ Moderate	Moderate	Moderate/ Minor	Minor
Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor	Minor/ Negligible
Low	Moderate	Moderate/ Minor	Minor	Minor/ Negligible	Negligible
Very Low	Moderate/ Minor	Minor	Minor/ Negligible	Negligible	Negligible/ None

19.70. Each effect is described and evaluated individually through the integration of all of the relevant factors and assessed as either significant or not significant. For landscape and visual effects, those effects identified at a substantial, major, major/moderate or moderate level (shaded grey in the table above) are generally considered to be significant and those effects assessed at a moderate/minor, minor, minor/negligible or negligible level are considered to be not significant.

19.71. In certain cases, where additional factors may arise, a further degree of professional judgement may be applied when determining whether the overall change in the view will be significant or not and, where this occurs, this is explained in the assessment.

Definition of Effect

19.72. Taking into account the levels of effect described above, and with regard to effects being either adverse or beneficial, the following table represents a description of the range of effects likely at any one receptor.

Definition of Effect

Effect	Definition
Substantial	Effects which are in complete variance to the baseline landscape resource or visual amenity.
Major	Effects which result in noticeable and fundamental alterations to the landscape resource or visual amenity.
Moderate	Effects which result in noticeable but non-fundamental alterations to the baseline landscape resource or visual amenity.
Minor	Effects which result in slight alterations to the landscape resource or visual amenity.
Negligible	Effects which result in barely perceptible alterations to the landscape resource or visual amenity.
None	No detectable alterations to the landscape resource or visual amenity.

Nature of Effect

19.73. It is a requirement of the EIA Regulations to state whether effects are adverse, beneficial or neutral. The landscape effects will be considered against the landscape baseline, which includes published landscape strategies or policies if they exist.

19.74. Visual effects are more subjective as people's perception of development varies through the spectrum of negative, neutral and positive attitudes. In the assessment of visual effects the assessor will exercise objective professional judgement in assessing the significance of effects and will assume, unless otherwise stated, that all effects are adverse, thus representing the worst-case scenario.

STAGE 9: CUMULATIVE EFFECTS ASSESSMENT

19.75. Cumulative effects result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments in the study area. The separate effects of the proposals may not be significant; however, together they may create a significant effect.

19.76. The schemes to be considered in the cumulative assessment can include the proposed development with other committed developments (i.e. operational, those that have already begun construction, those that have not been commenced but have a valid planning permission and those schemes which are in the planning process and details have been released by the planning authority).

19.77. The potential assessment of cumulative effects repeats the assessment process set out above, but considers the potential change caused by all schemes identified for cumulative assessment.

19.78. Cumulative landscape character and visual effects would potentially occur when one or more development proposal in conjunction with the proposals are apparent in views from certain locations. Seen together (simultaneously) or one after the other on a linear route (sequentially) two or more development proposals may affect landscape character, valued landscapes, views and/or visual amenity.

19.79. Other developments to be considered in the cumulative assessment are usually agreed in advance with the Local Planning Authority.