Great North Road Solar and Biodiversity Park

Environmental Statement

Volume 4 – Technical Appendices

Technical Appendix A7.2 – Landscape and Visual Methodology

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Contents

A7.2.1 INTRODUCTION

1 The primary guidance in relation to Landscape and Visual Impact Assessment (LVIA) is the Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3) [1], as clarified by LITGN-2024-01 Notes and Clarifications[2].

2 GLVIA3 states that:

3 *"Landscape and Visual Impact Assessment is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and people's views and visual amenity."* (GLVIA3, paragraph 1.1).

4 *"…professional judgement is a very important part of the LVIA"* (paragraph 2.23) and that *"in all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others."* (paragraph 2.24). It goes on at paragraph 3.32 to state that *"there are no hard and fast rules about what effects should be deemed 'significant" but LVIAs should always distinguish clearly between what are considered to be the significant and non-significant effects."*

5 Landscape and visual assessment are separate, though linked and GLVIA3 notes they require *"related but very different considerations"*. The assessment of the potential effect on the landscape is considered in terms of change to the environmental resource (i.e., the landscape). Visual effects are a related effect on people.

6 Landscape effects derive from changes to physical landscape features which may give rise to changes in its distinctive character and how this is experienced, including consideration of aesthetic and perceptual aspects.

7 Visual effects relate to changes that arise in the composition of views that people see as a result of changes to the landscape and their perception of how this alters visual amenity.

A7.2.2 ESTABLISHING THE BASELINE

8 The baseline is evaluated through desk study and site work and is the current situation at the time of the assessment, unless noted otherwise. Operational developments and those under construction are considered as part of the baseline (as advised in GLVIA3, paragraph 7.13) and included as part of the assessment of landscape and visual effects.

9 The future baseline consists of changes to the landscape which are considered certain or likely to happen – including consented proposals which are not yet present in the landscape but are expected to be constructed. These are typically also included as part of the future baseline (where they are likely to be constructed before the proposed development) but may be included within the assessment of cumulative effects if their construction is

[1] Landscape Institute and Institute of Environmental Management and Assessment (2013). Guidelines for Landscape and Visual Impact Assessment: Third Edition (GLVIA3).
[2] Landscape Institute (2024), Notes and Clarifications on Aspects of GLVIA3.

less certain or the timing is likely to be later. The approach and reasoning is set out within the assessment.

A7.2.3 LANDSCAPE EFFECTS

10 The starting point for assessment is a desk-based review of published landscape studies, which may include landscape character assessments, sensitivity and capacity studies and/or landscape designation reviews. These documents are listed in the assessment references.

11 In order to reach an understanding of the effects of development upon the landscape resource it is necessary to consider different aspects of the landscape including:

- Landscape Fabric: The individual physical features of the landscape, such as hills, valleys, woods, hedges, tree cover, vegetation, buildings and roads for example. Effects on these are described and quantified (for example *"25m of hedgerow will be removed"*); and
- Landscape character: The key characteristics of the receiving landscape. The degree to which the proposed development changes *"distinct and recognisable pattern of elements, or characteristics, in the landscape that make one landscape different from another, rather than better or worse"* ('An Approach to Landscape Character Assessment'[3]).

A7.2.3.1. Sensitivity of Landscape Receptors

12 The sensitivity (High, Medium, Low) of the landscape to a particular development is considered on a case by case basis and considers the susceptibility of the landscape, which varies depending on the type of development proposed and the attributes of the landscape receptor, and the landscape value. As stated in GLVIA3, *"LVIA sensitivity is similar to the concept of landscape sensitivity used in the wider arena of landscape planning, but is not the same"*, and for this reason judgements reached within the LVIA relating to sensitivity may differ from published baseline studies.

13 Landscape value (National, Regional, Community) reflects the importance attached to a landscape by society, often used as a basis for designation or recognition which expresses national or local authority consensus, because of its special qualities/attributes. The factors which are considered are informed by specific guidance[4] and include aesthetic or perceptual aspects such as scenic beauty, tranquillity or wildness or cultural associations as well as recreational/community value, conservation interests, landscape character and condition and representativeness/rarity.

14 Landscape susceptibility (High, Medium, Low) according to GLVIA3 means *"the ability of the landscape to accommodate the proposed Development*

[3] Natural England (2014). An Approach to Landscape Character Assessment. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/691184/landscape-character-assessment.pdf [accessed 22 March 2024].

[4] Landscape Institute (2021). Technical Guidance Note 02/21 Assessing landscape value outside national designations. Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2021/05/tgn-02-21-assessing-landscape-value-outside-national-designations.pdf [accessed 22 March 2024].

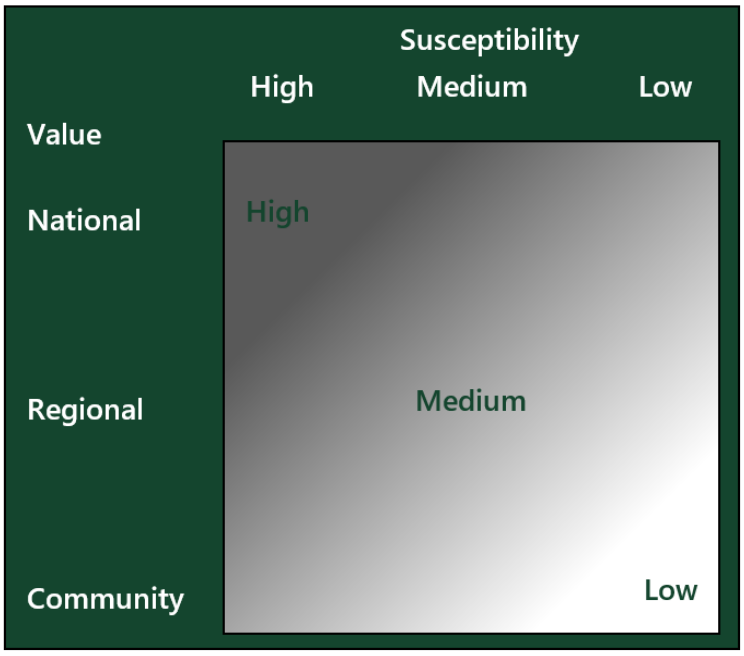
without undue consequences for maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies". Judgements on landscape susceptibility include consideration of both the physical and aesthetic attributes and the potential scope for mitigation. The approach to this is also informed by specific guidance[5].

- Susceptibility of landscape character areas are influenced by their characteristics and are often considered (though often recorded as 'sensitivity' rather than susceptibility) within landscape character assessments and capacity studies; and
- Susceptibility of designated landscapes is influenced by the nature of the special qualities and purposes of designation and/or the valued elements, qualities or characteristics, indicating the degree to which these may be unduly affected by the development proposed.

15 The criteria and the detailed judgements regarding susceptibility and value of landscape receptors are identified within the main chapter and appendices to this assessment.

16 Sensitivity is judged taking into account the judgments about the value and susceptibility of the receptor as illustrated by Diagram 1 below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

Diagram 1 - Sensitivity of landscape receptors



A7.2.3.2. Scale of Change to Landscape Receptors

17 The approach to assessing effects on landscape character is to consider the key characteristics for the Landscape Character Type (LCT) within which the proposed development is located (host) and the adjacent LCTs (non-host) and identify to what degree they would be altered by the proposed

[5] Natural England (2019). An Approach to Landscape Sensitivity Assessment. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/817928/landscape-sensitivity-assessment-2019.pdf [accessed 22 March 2024].

development. A similar approach applies to designated landscapes, for which the effects on the defined purposes of designation and special qualities are considered.

18 The magnitude of landscape change arising from the proposed development at any particular location is assessed in terms of its size or scale, extent of the area or receptor that is influenced, and the duration and reversibility of the change.

19 The scale of the change (Large, Medium, Small, Negligible) takes account of:

- Degree of alteration to key landscape features/elements; characteristics; and for designated areas – special qualities and/or purposes of designation;
- Distance from the development; and
- Landscape context to the development.

A7.2.4 VISUAL EFFECTS

20 This aspect of the assessment considers the views seen by people living in, visiting and travelling through the assessment study area. LVIA focusses on changes to views experienced from public spaces (public amenity) as an environmental effect. Assessment of effects on views from people's homes and gardens (private amenity) or other private property is a separate planning matter and is provided as a separate assessment under different guidance – see TA A7.4 (EN00162/APP/6.4.7.4).

21 In order to identify the level of a visual effect it is necessary to establish the relative sensitivity of the viewers and the magnitude of the change they experience.

A7.2.4.1. Sensitivity of Visual Receptors

22 Sensitivity (High, Medium, low) is a combination of both susceptibility of the viewer to the proposed change and the value of the views.

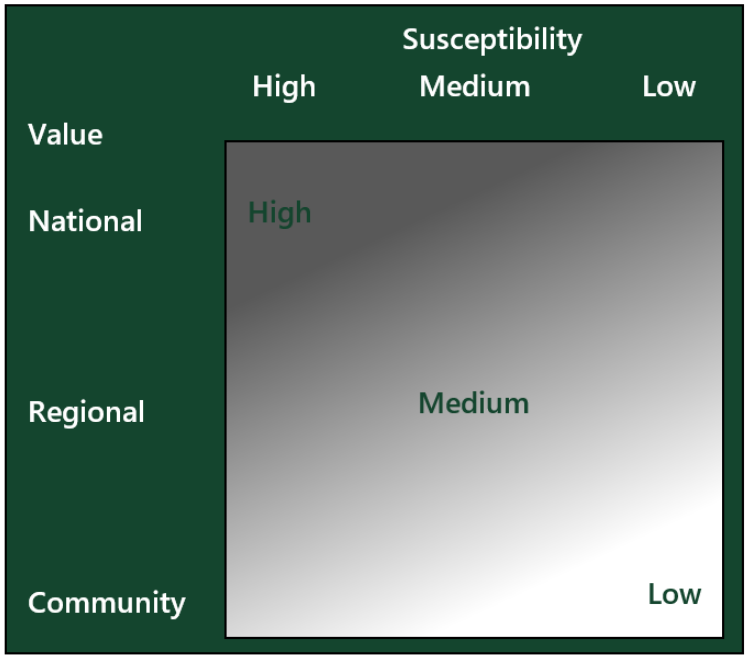
23 Those living within view of the scheme are usually regarded as the highest susceptibility group as well as those engaged in outdoor pursuits for whom the visual experience is a key part of the objective. For visual receptors susceptibility and value are closely linked - the most valued views are also likely to be those where viewer's expectations will be highest. Visual receptor susceptibility is defined as in accordance with the criteria below.

- High - Local residents; users of outdoor recreational routes and areas (including equestrians) focussed on the appreciation of views including footpaths, beauty spots and picnic areas; people experiencing views to or from important features of physical, visual, cultural or historic interest;
- Medium - Local road users and travellers on trains. People engaged in outdoor recreation with some appreciation of the landscape e.g. road cycling, nature conservation, golf and water based recreation; and
- Low - Workers, users of facilities and commercial buildings (indoors) experiencing views from buildings. Road and rail users on fast moving commuting or trunk routes. Visual receptors where views are incidental to the activity and/or location.

24 The value of public views (National, Regional, Community) depends on the nature, location and context of the view and the recognised importance of the view. Considerations include cultural associations; designation or policy protection; views of or from landmarks; and/or the promoted or recognised scenic quality of the view. The value attributed relates to the value of the view, e.g. a National Trail is nationally valued for access, but not always for the available views from every section.

25 Sensitivity is judged taking into account the component judgments about the value and susceptibility of the receptor as illustrated by Diagram 2 below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

Diagram 2 – Sensitivity of visual receptors



A7.2.4.2. Scale of Change to Views

26 The magnitude of visual change arising from the proposed development at any particular location is assessed in terms of its size or scale, extent of the area or receptor that is influenced and the duration and reversibility of the change.

27 The representative viewpoints are used as ‘samples’ on which to base judgements of the scale of change on visual receptors. The wider extent of the change and its duration are not captured in the viewpoint analysis (as a single location cannot capture these factors for an entire route or area). As duration and extent are necessary considerations in determining magnitude of change, magnitude and level of effect judgements are provided for visual receptors and not for viewpoints.

28 Each route and receptor group will encompass a range of possible views, which might vary from no view of the development to very clear, close views. Effects are described to identify where views towards the development are likely to arise and what the scale and duration and extent of those views are likely to be – informed by site work, ZTV studies and the representative viewpoints nearby. Each of these individual effects are then considered

together in order to reach a judgement of the effects on the visual receptors along that route, or in that place. The exceptions to this are specific viewpoints – where people visiting that location to look at the view are assessed as a visual receptor group.

29 The scale of the change to views (Large, Medium, Small, Negligible) arising from the proposed development reflects the degree to which the views from that location would be changed and takes account of:

- The distance of the viewpoint from the development;
- The degree to which the development is visible or screened;
- The angle of view in relation to main receptor activity or main focus of the view;
- The horizontal and vertical field of view occupied by the development; and
- The degree to which the development alters the nature of the available views.

30 The approach to assessing effects on views is to consider the full 360 degree view from any given receptor – not just those towards the development and/or shown in visualisations. It is assumed that the change would be seen in clear visibility in winter and the assessment is carried out on that basis. Where there are operational (and consented) developments considered as part of the baseline, the visual effects consider the effects of adding the proposed development to that baseline. Where appropriate, comment may be made on lighting and seasonal or weather conditions.

A7.2.5 MAGNITUDE

31 Magnitude of change (Large, Medium, Small, Negligible) judgements take account of the degree of change arising from the proposed development at any particular location in terms of its size or scale, extent of the area or receptor that is influenced, and the duration and reversibility of the change.

32 The judgement of the extent of change (Wide, Intermediate, Localised or Limited) reflects the geographic area (or length of a route) in terms of relative size and importance to the receptor.

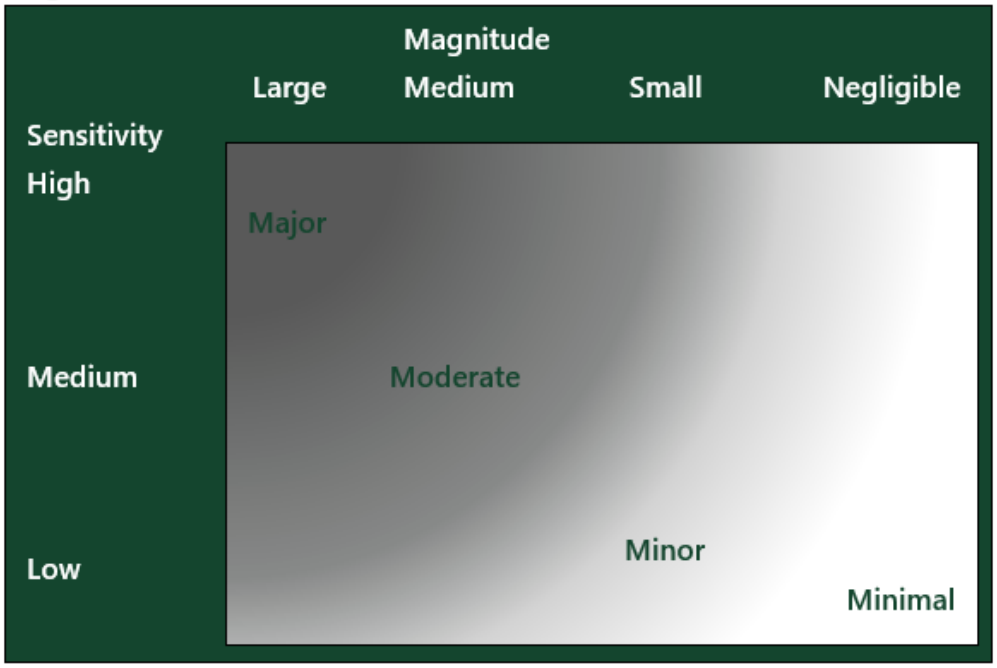
33 Duration and reversibility can be linked depending on the nature of the development. Reversibility is a judgement about the ability and practicality of the proposed development to be reversible (such as solar farms which are predominantly reversible), partially reversible to something similar (such as mineral extraction) or a permanent change in the landscape (such as housing). Duration reflects how long the change will last. The duration of the change would be considered Short-term when lasting less than 2 years; Medium-term when lasting between 2 and 10 years; or Long-term when lasting between 10 and 25 years, and Permanent for more than 25 years.

34 The maximum scale of change on the receptor is the primary factor in determining magnitude. However for particularly widespread and/or long lasting effects the magnitude judgement may be slightly greater than the scale of change; or for effects that are constrained in geographic extent and/or short-lived the magnitude of change may be slightly lower than the scale of change.

A7.2.6 LEVEL OF EFFECT AND SIGNIFICANCE

35 The level (Major, Moderate, Minor, Minimal) of any identified landscape or visual effect reflects a professional judgement as to the relative importance of the effects identified, taking account of the sensitivity of the receptor and the predicted magnitude of change as illustrated by Diagram 3 below.

Diagram 3 – Level of effect



36 Where the effect has been classified as Major or Major/Moderate this is considered to be equivalent to likely significant effects referred to in the EIA Regulations. Where 'Moderate' effects are predicted, professional judgement is applied to ensure that the potential for significant effects arising has been thoroughly considered.

A7.2.7 BENEFICIAL / ADVERSE

37 Landscape and visual effects can be Beneficial (an improvement) or Adverse (a change for the worse) and in some instances may be considered Neutral (neither better nor worse – just different). Whether an effect is beneficial, neutral or adverse is identified based on professional judgement. GLVIA 3rd edition notes that this is a *"particularly challenging"* (para. 2.15) aspect of assessment, especially in the context of a changing landscape.

A7.2.8 NIGHT-TIME EFFECTS

38 There is a distinction between light pollution or nuisance (which would be the subject of a technical lighting assessment) and the effect of lighting on the amenity of the landscape at night. This aspect of assessment is still an emerging discipline regarding the scope and receptors which would be impacted as a result of lighting. No night-time assessment is required for the Development.

A7.2.8.1. Landscape Character

39 The key characteristics of landscapes which distinguish the landscape character areas described in character assessments are generally obscured after dark. Potential changes to landscape character at night would arise from changes skylines and to perceptions of darkness and an absence of development. Changes to this small subset of characteristics would not be likely to give rise to notable effects on landscape character and are not considered in detail within the assessment.

A7.2.8.2. Visual Receptors

40 For visual receptors, the value attached to night-time views is considered to be low unless there is a particular element that can be best appreciated in the hours of darkness. This may include views of landmarks that are lit at night, or recognised dark skies areas (e.g. Dark Sky Parks and Discovery Sites as identified by https://www.darkskydiscovery.org.uk/). The susceptibility of visual receptors also differs at night reflecting the different activities people undertake in the hours of darkness. For example, drivers using roads at night tend to be more focused on the road and the area illuminated by their headlights than during the day and may have oncoming headlights, cats eyes or reflective signage drawing their attention, resulting in low susceptibility. This is particularly the case on unlit rural roads that may be narrow and winding. People taking part in activities such as stargazing, would be of high susceptibility. People in settlements would be of similar sensitivity as in the daytime.

41 The assessment focusses on locations where people are likely to be present at night. Recreational routes and other outdoor recreational locations are generally unlikely to be used at night (unless they are lit or specifically promoted for e.g. stargazing) and are not considered.

A7.2.8.3. Designations

42 For landscape receptors, susceptibility is judged based on the degree to which they are currently characterised by darkness. Value is judged based on document indicators of value (e.g. a Dark Sky Park), and special qualities or purposes of designation which can be appreciated at night.

A7.2.9 CUMULATIVE EFFECTS

43 For Nationally Significant Infrastructure Projects in England, the relevant guidance is provided by PINS [6].

44 In line with GLVIA3 (paragraph 7.5) and PINS guidance, the assessment of cumulative effects should focus on whether there are any likely significant cumulative impacts which are reasonably foreseeable and which are likely to influence the decision making for the Development, rather than an assessment of every potential cumulative effect. In practice this means considering other nearby development proposals and the effects that might

[6] Planning Inspectorate (20 September 2024). Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. Available at: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment, [accessed on 07/11/2024].

arise from the combined influence of those with that of the Development on landscape and visual receptors.

45 As advised in the Planning Inspectorate guidance, operational developments are included in the baseline and consented development which is expected to be constructed forms part of the future baseline and is included as such. However, where there is some uncertainty regarding the future construction of consented developments, they may be considered as the first scenario of the cumulative assessment.

46 Proposals in planning are considered where there is good reason to assume that the timing of decisions may be similar and significant cumulative effects are likely. The assessment of effects is considered within the cumulative assessment.

47 Proposals in scoping and other potential developments such as local plan allocations may be considered in the cumulative effects assessment but usually not in detail as insufficient information is usually available to inform a good understanding of potential landscape and visual effects given such projects may or may not come forward as applications and design information is likely to be limited, absent and/or likely to change.

48 The assessment is based on the same landscape and visual baseline and receptor groups as the main LVIA, and the methodology is the same in terms of forming and expressing judgements. Two types of judgement may be provided:

- Additional effects –The effects that would arise from the addition of the proposed development to a baseline which includes the cumulative development(s) being considered; and
- Combined effects – The effects that would arise from the addition of both the proposed development and the cumulative development(s) being considered to the main assessment baseline.

49 Typically, only the additional effects need to be considered and the cumulative assessment is provided to inform decision-making in the event that one or more of the cumulative developments has been consented prior to the proposed development (i.e. the future baseline has changed). The combined effects may be relevant where two or more development applications are determined together.

50 Cumulative effects on landscape receptors arise from combined effects on the same receptor – such as two developments within the same character area; or one development within, and one visible from, a designated area.

51 Cumulative effects on visual receptors arise either from two (or more) developments both being visible from the same place; or from sequential views as people travel.

52 In order to simplify what may otherwise be a complex assessment, the following approaches are also used:

- The cumulative assessment considers scenarios within which developments may be ‘grouped’ - for instance two nearby cumulative proposals may be considered in one scenario if it is considered that the cumulative effects arising if one or both are developed are likely to be similar; and

- Receptors judged to receive Negligible or Small/negligible magnitude effects are not considered for cumulative effects on the basis that any significant effects arising would be unlikely to be contributed to by the proposed development.

53 Qualitative assessment of design and aesthetic considerations arising as a result of cumulative development, and/or considerations set out within local guidance provided in relation to cumulative development, is also provided where relevant.

A7.2.10 VISUAL AIDS

A7.2.10.1. Guidance and Standards Used

54 All visibility maps (ZTVs), photography, visualisations (wirelines and photomontages) and their graphical presentation have been undertaken to relevant guidance[7].

A7.2.10.2. Visibility Maps: Zone of Theoretical Visibility

55 Zone of Theoretical Visibility (ZTV) maps have been generated using GIS software to assist in in identifying areas where visibility would not occur as well as informing viewpoint selection. They illustrate areas where part or all of the proposed development may be visible to indicate its potential influence in the wider landscape.

56 The computer models include the study area and calculations of visibility take account of the effects caused by atmospheric refraction and the Earth's curvature.

57 The ZTVs include vegetation and buildings. The location and extent of woodland and buildings is derived from OS Open data and heights for these (7.5 m for buildings and 15 m for woodland) are added to the bare ground model. As a result, the ZTV study does not take account of all above ground features – only those included as woodland and buildings in the OS mapping at the time the ZTV was prepared. These ZTV studies present a more realistic visibility pattern than bare ground studies, but do not take detailed account of felling cycles, tree growth, demolition or construction and use conservative averages for building and woodland heights..

A7.2.10.3. Visualisations

58 Visualisations were provided by Faulhaber Design Ltd. The methodology is provided in Annex 2.

A7.2.10.3.1. Verification

59 Technical details meeting TGN 06/19 requirements for type 4 visualisations as identified in Appendices 10 and 11 of the TGN are set out either in this methodology, or on the individual visualisations, with the exception of the make and model of panoramic head and elements used to check vertical and horizontal alignment. TGN 06/19 suggests that these will vary by project,

[7] Landscape Institute (2019). Technical Guidance Note 06/19: Visual Representation of Development Proposals. Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf [accessed 22 March 2024].

but in practice these vary by viewpoint (as photography is undertaken at separate times or by different photographers; or where viewpoints are sufficiently distant from each other that they do not share the same elements suitable for matching). These details and the 'additional imagery' requirements of a photograph of the tripod location and a 'composite view' showing the underlying construction of a photomontage are recorded for each viewpoint and can be provided if required for verification purposes.

A7.2.10.3.2. Data Accuracy

60 Accuracy figures for the following terrain data products are expressed statistically by the providers as root-mean-square error (RMSE) in metres:

- OS Terrain®50 (50 m resolution): 4 m RMSE.
- OS Terrain®5 (5 m resolution): Urban and major communication routes 1.5m RMSE; Rural 2.5 m RMSE; Mountain and moorland 2.5 m RMSE.
- DEFRA LiDAR: 0.15 m RMSE

A7.2.11 ANNEX 1: GLOSSARY OF TERMS

Note – many of these definitions are taken from GLVIA3.

Term	Definition
CLVIA	Cumulative Landscape and Visual Impact Assessment.
Cumulative Effects	Cumulative effects are the additional effects arising from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.
Direct Effect	A direct (or primary) effect may be defined as an effect that is directly attributable to the development.
GLVIA3	*'Guidelines for Landscape and Visual Impact Assessment, Third Edition'*, published jointly by the Landscape Institute and Institute of Environmental Management and Assessment 2013.
Indirect Effect	An indirect (or secondary) effect is an effect that results indirectly from the proposed project as a consequence of the direct effect, often occurring away from the site, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or in time from the source of the effects.
Key Characteristics	Those combinations of elements which are important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
LVIA	Landscape and Visual Impact Assessment.
Landscape Capacity	The amount of change which a particular landscape character type or area is able to accommodate without significant detrimental effects on its character. Capacity is likely to vary according to the type and nature of change proposed.
Landscape Character	The distinct and recognisable pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape Character Areas	These are single unique areas which are the discrete geographical areas of a particular landscape type.
Landscape Character Types	These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur, they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern, and perceptual and aesthetic attributes.
Landscape Effects	Effects on the landscape as a resource in its own right.
Landscape Elements	Individual components which make up the landscape such as trees and hedges.

Term	Definition
Landscape Features	Particularly prominent or eye-catching elements, like tree clumps, church towers or wooded skylines.
Landscape Quality or Condition	This is a measure of the physical state of the landscape. It may include the extent to which a typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Landscape Receptor	Defined aspects of the landscape resource that may be affected by a proposal.
Landscape Resource	The combination of elements that contribute to landscape context, character and value.
Landscape Value	The relative value or importance attached to different landscapes by society on account of their landscape qualities.
Level of Effect	Determined through the combination of sensitivity of the receptor and the proposed magnitude of change brought about by the development. The level of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and sensitivity of the receptor) that should be attached to the impact described.
Magnitude (of change)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short or long term in duration.
Mitigation	Measures including any process, activity or design to avoid, reduce, remedy or compensate for adverse environmental impact or effects of a development.
Photowire	A visualisation which superimposes a simple wireline of a proposed development upon a photograph or series of photographs.
Photomontage	A visualisation which shows a rendered image of a proposed development set within a photograph or series of photographs edited to show screening by intervening features.
Residential Visual Amenity	A collective term describing the views and visual amenity from a residential property, relating to the type, nature, extent and quality of views that may be experienced from the property and its 'domestic curtilage' including gardens and access driveway. Residential Visual Amenity is only one component of the overall Residential Amenity, others being for example noise, shadow flicker and access amongst others.
Residual Effects	Potential environmental effects remaining after mitigation.
Sense of Place	The essential character and spirit of an area.

Term	Definition
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
Significant Effects	It is a requirement of the EIA Regulations to determine the likely significant effects of development on the environment. Where possible significant effects should be mitigated. Judgements as to whether an effect is significant or not are based on the level of effect, with the more important effects being deemed significant.
Type or Nature of Effect	Whether an effect is direct, indirect, temporary or permanent, positive (beneficial), neutral or negative (adverse) or cumulative.
Visual amenity	Value of a particular place in terms of what is seen by visual receptors taking account of all available views and the total visual experience.
Visual Effect	Effects on specific views and on the general visual amenity experienced by people.
Visual Receptors	Individuals and/or defined groups of people who may be affected by a proposal.
Visualisation	Computer simulation, photomontage or other technique to illustrate the appearance of a development.
Wildness	A quality of appearing to be remote, inaccessible and rugged with little evidence of human influence.
Wireframe or Wireline	A computer generated line drawing of the DTM (Digital Terrain Model) and the proposed development from a known location.
Zone of Theoretical Visibility (ZTV)	Area within which a proposed development may have an influence or an effect on visual amenity.

A7.2.12 ANNEX 2: VISUALISATION METHODOLOGY

A7.2.12.1. Introduction

61 The purpose of this statement is to establish the procedure used to create the 90º photographic panoramas, wirelines and photomontages showing the proposals at the above location. These were carried out using the Landscape Institute and Institute of Environmental Management & Assessment Guidelines for Landscape and Visual Assessment, Third Edition. Also the Landscape Institute Technical Guidance Note, Visual Representation of Development Proposals, Note 06/19.

62 The photographic view panoramas are type 1, wireline visualisations are Type 2, and photomontage visualisations are Type 3, as set out in table 2 of the Landscape Institute Technical Guidance Note, Visual Representation of Development Proposals, Note 06/19.

63 All work was carried out using OSGB36 (National Grid and Ordinance Datum) Coordinate Reference System.

A7.2.12.2. Software and Hardware

64 Hardware used:

- Apple Macintosh computers
- Nikon D750 full frame digital camera using 50mm f/1.4 lens
- Sony ILCE-7C full frame digital camera using FE 50mm F2.8 lens
- Nikon D5 full frame camera using Nikkor 50mm AF f/1.8 lens

65 Software used:

- VectorWorks
- Twinmotion
- Adobe Photoshop
- PTGui
- Quantum GIS
- Blender

A7.2.12.3. Photography

66 The photographic views were taken on various days between December 2023 and May 2025, using high-resolution digital cameras with 50 mm fixed focal length lenses. The centre of the lens was set at an approximate height of 1.5m above existing ground level. Individual photographs were taken using a tripod, which was levelled using the tripod mounted level. At each viewpoint location photographs where taken to include a 360º horizontal field of view. The viewpoint locations were selected and provided by Abseline LLP.

67 The photography was carried out with regard to the guidance and photography methodology as set out in LI guidance note 06/19 appendix 1 - 3.

68 The individual photographs were stitched into cylindrical panoramas using PTGui, these were then saved as full 360º cylindrical panoramas.

69 The view locations provided by Abseline LLP were checked against the photographic panoramas using aerial photography from web sites Google Maps (www.google.com/maps) and UK Grid Reference Finder (https://gridreferencefinder.com) and where necessary were slightly adjusted to match the location of the photographic panoramas accurately.

A7.2.12.4. Terrain and surface modelling

70 Environment Agency LiDAR survey data was loaded into QGIS and used to prepare a Digital Terrain Model including the entire area covered by the proposals and viewpoints (20 km x 20 km). National Lidar Programme 2022 Composite terrain data, provided on a 1m grid, was resampled to a 5m grid using an algorithm that derives an area-weighted average. National Lidar Programme 2022 Composite first return surface data, also on a 1m grid, was resampled to a 5m grid using an algorithm that derives an area-weighted average alongside an algorithm that takes a maximum reading, to create a combined model that captures the full height of surface features without distorting the terrain.

71 The resulting height maps were imported into Blender and used to create geographically accurate height-displacement meshes. These meshes were then simplified using a decimation algorithm and an aerial photography layer matching the same extents was draped over them. The resulting terrain mesh was tested for accuracy against 1 m interval contour lines exported from the original terrain data.

72 In addition, Ordnance Survey Terrain50 data was used to extend the terrain model by 25 km in all directions, following the same process - data was imported into QGIS at its original 50 m grid resolution and converted into a height map which was used to create a displacement mesh in Blender, which was simplified, draped with aerial photography, correctly aligned with the Lidar -derived mesh and the area already covered by the Lidar mesh clipped out.

A7.2.12.5. Proposals modelling

73 All proposals were modelled according to drawings and the information in ES Chapter 5 [EN010162/APP/6.2.5].

A7.2.12.6. Wirelines modelling

74 The solar tables and Inverters were arranged to match the illustrative layout, which was derived from the parameters set out in ES Chapter 5 [EN010162/APP/6.2.5]. The dimensions of the tables and Inverters were changed to match the maximum parameters from Chapter 5. Weather Stations matching the Chapter 5 maximum parameters were added next to each Inverter.

75 Panel tables were arranged at existing ground level with an appropriate tilt east to west using Lidar terrain data.

76 Fence posts and CCTV cameras were modelled around the full perimeter of all fence lines, to the maximum parameters from Chapter 5.

77 The proposed BESS, main substation, and intermediate substations were modelled by extruding the existing terrain of the full works areas to the maximum potential development height as set out in Chapter 5.

78 All proposed woodland blocks were modelled by extruding the existing terrain of each woodland block to 7 m above existing levels.

79 All cumulative sites were modelled using plans and heights taken from their respective planning application documents. Plans were geolocated and the maximum extents of development traced in QGIS. These areas were extruded to the stated maximum height of each proposed development.

A7.2.12.7. Year 0 Photomontage modelling

80 Solar tables, CCTV cameras and weather stations were replaced with more detailed models that still match the maximum parameters set out in ES Chapter 5 [EN010162/APP/6.2.5].

81 Realistic textures were added to all elements, including fence posts, inverters and the individual panels in the detailed solar table model.

82 Proposed intermediate substation works areas were clipped to accommodate proposed planting buffers as necessary, then extruded to the maximum height parameters in Chapter 5 and coloured RAL 6005 Moss Green.

83 The proposed BESS was modelled generically based on an illustrative layout received from Elements Green, with each individual element modelled to the maximum parameters set out in Chapter 5. Containers were shaded RAL 7035 Light Grey, and the acoustic fence was shaded RAL 6005 Moss Green.

84 The proposed 400 kV substation was modelled generically according to an illustrative layout received from Elements Green, with all components modelled according to heights derived from an elevation drawing received from Elements Green. All elements were placed on a flat pad at 15.7 m AOD, which was considered the maximum height feasible to maintain realistic vehicle access.

85 All different landscape areas from the LEMP were separated and shaded distinctly on the overall terrain model, including tracks.

86 Deer Fence was modelled around woodland planting blocks as shown on the LEMP.

87 Of the consented cumulative schemes, the only schemes visible in photomontages were Muskham Wood and Knapthorpe. These schemes were modelled by filling the areas identified at the wireline phase with solar table models that match parameters derived from planning application documents.

A7.2.12.8. Year 10 modelling

88 All elements of Year 10 planting were modelled according to the LEMP and to realistic growth and management heights as instructed by others.

89 All existing and proposed hedgerows marked on the LEMP were modelled as 2.35 m high extrusions from the terrain model.

90 All proposed trees within and adjacent to existing and proposed hedgerow trees were modelled in the locations shown in the LEMP as 'lollipop' models and scaled randomly between 6 m and 7.5 m.

91 All woodland blocks and planting buffers / tree belts were densely filled with 'lollipop' tree models scaled randomly between 5 m and 7.5 m. The deer fence was removed from the model.

92 'Ecotone' areas were filled with randomly scattered clumps of 'lollipop' models randomly scaled between 1.5 m and 3 m with occasional small trees between 3 m and 5.5 m.

93 'Wood Pasture' was modelled as occasional trees, placed randomly and scaled randomly between 3 m and 5.5 m.

A7.2.12.9. Rendering

94 All different elements were compiled in Twinmotion rendering software.

95 At each viewpoint, full 360º cylindrical renders were produced, showing: the existing Lidar surface model with aerial photography drape and all compass points; all elements of the wireline modelling, over a wireline render of the terrain model.

96 Each 90º view for both wirelines and photomontages was rendered as three separate images matching the camera parameters of the original photography at an appropriate resolution and stitched together in PT GUI.

97 For all photomontages, the rough location, date, time and weather conditions were matched to the original photography.

A7.2.12.10. Compositing and alignment

98 For each viewpoint, the 360º photographic panoramas and 360º rendered panoramas were compiled on different layers in Adobe Photoshop and adjusted horizontally until a good match was found.

99 The Lidar-derived surface model was used to double check alignment, viewpoint location, and accurate panorama stitching.

100 Each viewpoint image was split into 90º sections, with orientations decided based on visibility and noted, using compass point orientations from the Lidar surface model render.

101 The 90º sections were resized to an appropriate output size and resolution (82 cm horizontal, 24 cm vertical, at 300 dpi).

102 Stitched 90 degree panoramas of the rendered wireline model were positioned using the original 360º rendered panoramas, and appropriate adjustments made to levels and colour in Adobe Photoshop.

103 Consented cumulative schemes were depicted as solid grey blocks. Woodland blocks were depicted as semi-transparent green.

104 Cumulative schemes still in the planning process where shown as clearly coloured blocks. Where a cumulative scheme in planning blocked views of the proposed, two versions of the wireline were produced, with and without the cumulative schemes in planning.

105 Stitched 90 degree panoramas of the fully rendered year 0 photomontage model were positioned using the original 360º rendered panoramas and the wireline renders, and appropriate adjustments made to levels and colour in Adobe Photoshop.

106 A combination of plans, aerial photography and the Lidar surface model were used to determine where existing features in the photography would obscure views of the proposed. These were clipped in Adobe Photoshop and placed on new layers to create realistic screening effects in the final images.

107 Where proposed landscape coverings materially changed the ground cover this was shown in year 0 photomontage images (e.g., arable fields changing to grass).

108 90° stitched renders of the year 10 vegetation, screened by the proposals, were positioned using the year 0 renders and used as a guide to paint in realistic vegetation, based on species proposed, the time of year, and the appearance of other vegetation in the baseline photography.