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Table of Contents

1.	Landscape and visual impact assessment methodology	1
1.1	Introduction	1
1.2	Assessment methodology	2
1.3	Sensitivity of visual receptors	11
1.4	Magnitude of effects	12
1.5	Assessment of night time lighting effects	14
1.6	Significance of Effect.....	14
1.7	Relationship to the Glint and Glare Assessment	15
1.8	Relationship to Residential Visual Amenity	15
1.9	Methodology for the preparation of photomontages	16
1.10	References	18

Tables

Table 1-1: Landscape value criteria	7
Table 1-2: Criteria for Landscape Susceptibility	8
Table 1-3: Assessment of Landscape Sensitivity	9
Table 1-4: Classification of Views.....	10
Table 1-5: Classification of Visual Susceptibility.	11
Table 1-6: Classification of Sensitivity of Visual Receptors.	12
Table 1-7: Criteria for Magnitude of Landscape effects	13
Table 1-8: Criteria Descriptors for Visual Magnitude.....	13
Table 1-9: Night time brightness	14
Table 1-10: Sensitivity of Receptor in Relation to Magnitude of Effect.	15

1. Landscape and visual impact assessment methodology

1.1 Introduction

1.1.1 This appendix sets out the methodology applied in the Landscape and Visual Impact Assessment (LVIA), as reported in **Chapter 10: Landscape and Visual Amenity** of the Environmental Statement (ES) [EN010118/APP/6.1].

1.1.2 Landscape and visual effects are interrelated but are assessed separately:

- a. **Landscape effects** relate to changes to the landscape as a resource, including physical changes to the fabric or individual elements of the landscape, its aesthetic or perceptual qualities and landscape character; and
- b. **Visual effects** relate to changes to existing views of identified visual receptors (people), from the loss or addition of features within their view due to the Scheme.

1.1.3 The LVIA methodology involves the following stages:

- a. A review of published landscape character assessments, studies, relevant supporting evidence base documents, aerial photography, mapping and fieldwork to define the baseline and to determine the extent of the study area in which there is potential for significant effects;
- b. Define the landscape and visual receptors and describe the landscape and visual baseline. Following the identification of the landscape and visual receptors, these were presented to the LPAs for agreement, along with the extent of the LVIA study area;
- c. Ongoing review of the emerging design to embed mitigation measures into the Scheme to avoid or minimise adverse landscape and visual effects and maximise opportunities for landscape integration and enhancement, applying the criteria for good design in NPS EN-1;
- d. An assessment of the sensitivity (nature of the receptor) of landscape and visual receptors, via an assessment of their value and susceptibility to change;
- e. An assessment of the magnitude of impact (nature of effect) of the Scheme during the construction, year 1 year 15 and decommissioning phases. The magnitude of impact has been assessed in relation to the size, scale, duration and reversibility of the effect; and
- f. An assessment of the significance of the effect to the landscape and visual receptors for the above phases of the Scheme.

1.1.4 The assessment of the Scheme has been undertaken for:

- a. Peak construction activity in winter;
- b. Year 1 of operation, assuming the Scheme is built out and in winter;

- c. Year 15 of the operation, assuming the proposed planting has established, and the season is summer; and
- d. Decommissioning in winter.

1.2 Assessment methodology

Assessment guidance

- 1.2.1 The following guidance has been used to inform the scope and content of the LVIA, and to assist the identification and mitigation of likely significant effects. This builds upon the overarching EIA methodology and guidance presented in **Chapter 5: EIA Methodology** of the ES [EN010118/APP/6.1].
- 1.2.2 Guidelines for LVIA, 3rd Edition (GLVIA3) (Landscape Institute and Institute of Environmental Assessment and Management, 2013) (Ref 1) is the primary source of guidance for the assessment of landscape and visual effects. This is the successor to the 2nd edition referred to in footnote 125 of NPS EN-1.
- 1.2.3 Advice contained within the Natural England publication 'An Approach to Landscape Character' (Ref 2) was used to supplement the guidance and approaches to undertaking landscape character assessment contained GLVIA3 (Ref 1). The Landscape Institute's technical note regarding the assessment of landscapes outside national designations (Ref 3) has also informed the approach to the definition of landscape character areas and judgements of their respective value.
- 1.2.4 The design approach and landscape strategy for the Scheme was further supported by guidance set out in the Landscape Institute's Infrastructure Technical Guidance Note 04/2020 (Ref 4).
- 1.2.5 The Landscape Institute's Tranquillity Technical Guidance Note 2017 (Ref 5) was referred to in developing the approach to describing and assessing impacts on tranquillity of the Scheme (Ref 5).
- 1.2.6 Information contained within the Landscape Institute's Technical Guidance Note 06/19: Visual Representation of Development Proposals, 2019 was used to aid the selection and preparation of visualisations for the Scheme to support the LVIA (Ref 6), guiding the methodology for capturing viewpoint photography, preparation of visualisations and their presentation.
- 1.2.7 Landscape Institute's Technical Guidance Note 2/19: 'Residential Visual Amenity Assessment' (2019) (Ref 7).

Establishment of the study area and baseline

Study area

- 1.2.8 With reference to **Figure 10-1: LVIA Study Area**, the LVIA study area extends approximately 2 kilometres (km) from the Order limits to the north, east and west, and 4 km from the Order limits to the south.
- 1.2.9 The initial 'Area of Search', which was defined at the scoping stage, extended 4km from the Order limits. This was informed by consideration of the Scheme (including proposed solar arrays, BESS, solar stations, substation and construction plant) and desk-based analysis of mapping and aerial photography. A Zone of Theoretical Visibility (ZTV) (**Figure 10-8: Zone of**

Theoretical Visibility (Bare Earth) and Figure 10.9: Zone of Theoretical Visibility (with Surface Features)) was used to appraise the potential visibility of the Scheme. Other information sources referenced during the refinement of the study area included 1:25,000, 1:10,000 and 1:1,250 scale Ordnance Survey mapping, 3D topographical data and aerial photography.

- 1.2.10 Fieldwork was subsequently undertaken to verify the findings of the desk study. This analysis determined the study area, defined as the extent in which the Scheme may result in significant landscape or visual effects.
- 1.2.11 Extensive review of the study area was then undertaken in order to identify landscape and visual receptors that have potential to be affected by the Scheme.
- 1.2.12 The study area for the LVIA includes all land within the Order limits and the area within which the Scheme may give rise to significant landscape and visual effects, as illustrated in **Figure 10-1: LVIA Study Area**.

Establishing the baseline

Consultation

- 1.2.13 The Examining Authority and Local Planning Authorities were consulted on the scope of the LVIA through the scoping process. Further feedback on the scope of the LVIA was received from Local Planning Authorities and Parish Councils through Statutory Consultation. Additional consultation was undertaken with Wynne Williams Associates, acting on behalf of Essex County Council, Chelmsford City Council and Braintree District Council. This consultation included a series of meetings, emails and a site visit to agree the scope of the LVIA. Details of the consultation undertaken are recorded in **Table 10-3 of Chapter 10: Landscape and Visual Amenity** of the ES [EN010118/APP/6.1].

Desk study

- 1.2.14 Reference has been made to the prevailing policy framework including local plans and evidence base documents to identify any designated landscapes or features of value and their relationship to the Scheme. Further details regarding local policy are presented in **Appendix 10A: LVIA Policy** of the ES [EN010118/APP/6.2].
- 1.2.15 Other information sources referenced as part of the baseline review includes 1:25,000 and 1:10,000 scale Ordnance Survey mapping, 3-dimensional topographical data, and site photographs and aerial photography.

Fieldwork surveys

- 1.2.16 Fieldwork surveys have been undertaken by qualified and experienced landscape architects to record the winter and summer season conditions. Fieldwork was undertaken between May 2020 and April 2021. The purpose of this fieldwork will be to review the boundaries and key characteristics defined in the published landscape character assessments and to identify, record and map the following aspects and characteristics of the landscape:
 - a. Landcover, pattern and texture;
 - b. Scale and appearance;

- c. Tranquillity;
 - d. Cultural associations; and
 - e. Human interaction.
- 1.2.17 Attributes recorded as part of the fieldwork surveys included features and elements associated with the built environment and historic landscape and areas of managed landscape. Perceptual qualities of the landscape, such as background noise and tranquillity have also been recorded.
- 1.2.18 Fieldwork surveys have also been used to identify visual receptors and representative viewpoints and to clarify the extent of views, taking account of the effect of intervening features such as buildings and vegetation.
- 1.2.19 An extended Phase 1 Habitat Survey, Phase 2 Habitat / National Vegetation Classification surveys, arable flora survey, and veteran tree and hedgerow survey have been carried out as part of the ecological assessment reported in **Chapter 8: Ecology** of the ES [EN010118/APP/6.1]. Information from these surveys has been used, where relevant, to inform the identification of baseline landscape conditions.

Landscape baseline

- 1.2.20 Landscape is defined by the European Landscape Convention as “*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*” (Council of Europe, 2000).
- 1.2.21 GLVIA3 defines landscape receptors as “*aspects of the landscape resource that have the potential to be affected by a proposal*” (Landscape Institute and the Institute of Environmental Management and Assessment, 2013). Landscape receptors have been identified via a review of published landscape character assessments, maps and aerial photography, relevant planning policy and fieldwork surveys.
- 1.2.22 Landscape character is defined by GLVIA3 as “*a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.*”
- 1.2.23 Published landscape character assessments at the national, regional and district level have been reviewed to identify Landscape Character Types (LCT) and Landscape Character Areas (LCA). The geographical extent of LCAs in published assessments are generally large and may extend beyond the study area. To enable a more detailed assessment of the existing landscape character at a scale more relevant to the Scheme, Local Landscape Character Areas (LLCA) have been identified via desk study and fieldwork surveys in line with Natural England’s An Approach to Landscape Character Assessment (Ref 2). These LLCA form the basis of the assessment of landscape effects and inform the development of the masterplan and landscape design. They are generally be sub-divisions of existing LCAs identified in published landscape character assessments.

Tranquillity

- 1.2.24 Tranquillity is a perceptual aspect of landscape. GLVIA3 (Ref 1) defines tranquillity as “*a state of calm and quietude associated with peace, considered to be a significant asset of landscape*”.

1.2.25 CPRE, The Countryside Charity, have mapped relative tranquillity across England (Ref 8). These maps, which are available online, are based on a spectrum of more or less tranquil areas, such that the scores illustrated are relative and do not identify absolute tranquillity. The following factors have been considered in describing the baseline tranquillity for each Local Landscape Character Area. CPRE identify positive factors which contribute to tranquillity as:

- a. Openness of the landscape (freedom from development);
- b. Perceived naturalness of the landscape;
- c. Rivers in the landscape;
- d. Areas of low noise; and
- e. Visibility of the sea.

1.2.26 CPRE lists negative factors as:

- a. Presence of other people;
- b. Visibility of roads;
- c. General signs of overt human impact;
- d. Visibility of urban development;
- e. Road, train and urban area noise;
- f. Night-time light pollution;
- g. Aircraft noise; and
- h. Military training noise.

Visual baseline

1.2.27 Visual receptors are defined in GLVIA3 as “*individuals and/or defined groups of people who have the potential to be affected by a proposal*” (Ref 1). This includes residents, users of public rights of way (PRoW) and motorists.

1.2.28 A computer-generated zone of theoretical visibility (ZTV) have been prepared based on 3-dimensional models of existing terrain and the Scheme. GLVIA3 defines the ZTV as “*a map, usually digitally produced, showing areas of land within which a development is theoretically visible.*” The purpose of the ZTV is to:

- a. Identify the theoretical extents of the Scheme visibility i.e., the locations from which it could potentially appear in existing views;
- b. Assist in the identification of the study area;
- c. Identify visual receptors likely to be affected by the Scheme;
- d. Identify locations that are representative of the views experienced by visual receptors at different locations within the study area (representative viewpoints); and
- e. Inform the design, including the extent and type of proposed mitigation.

1.2.29 All ZTVs have been prepared under the guidance of a competent expert with an understanding of the requirements in undertaking these and a detailed knowledge of the Scheme.

- 1.2.30 ZTVs have been modelled using the 'Viewshed' tool in ESRI ArcMap GIS Software.
- 1.2.31 A bare earth ZTV was prepared using Environment Agency Lidar digital terrain model (DTM) data of 1m resolution. These ZTVs represent a worst-case scenario as they do not include features such as existing buildings or vegetation which can screen or filter views.
- 1.2.32 The ZTV that accounts for surface features, such as existing buildings and woodland, was prepared using Environment Agency digital surface model (DSM) of 2m resolution. This data represents the degree of potential screening or filtering of views of the Scheme.
- 1.2.33 For all of the ZTVs an assumed viewing height of 1.6m above ground level has been used to simulate the eye level of a person of average height.
- 1.2.34 The proposed PV Arrays, BESS, Longfield Substation and permanent plant buildings have been modelled as part of the ZTV.

Visual receptors and representative viewpoints

- 1.2.35 Visual receptors likely to experience views of the construction, operation or decommissioning of the Scheme have been identified through interrogation of the ZTVs and fieldwork surveys, and subsequently categorised into the following types:
- a. Residents;
 - b. Commercial;
 - c. Users of public rights of way; and
 - d. People traveling through the area on roads.
- 1.2.36 Where a collection of visual receptors in the same category are likely to experience similar views, they have been grouped.
- 1.2.37 A total of 57 representative viewpoints have been identified within the ZTV to assist in describing the baseline view and the effects likely to be experienced by visual receptors. These representative viewpoints have been selected on the basis that they cover a range of viewing distances, elevations and orientations from locations with different viewing experiences of the Scheme. The selection of representative viewpoints has been informed by the following criteria:
- a. Accessibility to the public;
 - b. Number and sensitivity of viewers who can be affected;
 - c. Viewing direction, distance (i.e., short, medium or long-distance views) and elevation;
 - d. Nature of the viewing experience;
 - e. View type; and
 - f. Cumulative views in conjunction with other development projects.
- 1.2.38 Photographs and visualisations have been prepared to either help demonstrate the nature of baseline views and the extent of the Scheme, or to

illustrate a particular matter such as the effectiveness of existing vegetation or the proposed planting in screening views.

- 1.2.39 These photographs and visualisations have been prepared in accordance with best practice guidance published by the Landscape Institute (Ref 7) and are presented as Type 1 (annotated viewpoint photographs).

Sensitivity of receptors

Landscape sensitivity

- 1.2.40 Paragraph 5.39 of GLVIA3 states that “*landscape receptors need to be assessed firstly in terms of their sensitivity, combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape*”.

Landscape Value

- 1.2.41 The assessment of the value of each landscape receptor has been informed by the information set out in the baseline, including any relevant landscape designations, geographic criteria and valued features as set out in GLVIA3 Box 5.1, e.g., aesthetic, perceptual or experiential value.
- 1.2.42 With reference to GLVIA 3, landscape value refers to the relative value that is attached to different landscapes by society. The definition and application of landscape value has also been informed by the ‘Landscape value and valued landscapes’ Technical Guidance Note 02/21 published by the Landscape Institute.
- 1.2.43 Landscape value has been determined with reference to the criteria set out in **Table 1-1**.

Table 1-1: Landscape value criteria

Classification	Description
Very High	A landscape with elements of national or international designation / importance and / or which is characterised by key characteristics and/or rare features.
High	A landscape with elements of national or regional designation / importance and / or which is characterised mainly by key characteristics and/or rare features.
Medium	A landscape with elements of local or neighbourhood designation / importance and / or a landscape with some key characteristics and/or distinctive features.
Low	A landscape with elements of community designation / importance and or common place features and few key characteristics.
Very Low	A landscape with no or very few elements of importance / designation, due to weak or discordant characteristics and one which detract from the quality of the area, such that it does not exhibit any key characteristics.

Landscape Susceptibility

1.2.44 GLVIA3 paragraph 5.40 defines the susceptibility to change of landscape receptors as:

“the ability of the landscape receptor (whether it be overall character or condition of a particular landscape type or area, or an individual element and/or features, or a particular aesthetic and perceptual aspect) 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” (paragraph 5.40).

1.2.45 The following aspects of the landscape are considered to be particularly susceptible to the change proposed:

- a. Agricultural character of the landscape;
- b. Sense of remoteness from development in the northern areas of the study area;
- c. Landscapes with sloping or elevated topography associated with river valleys;
- d. Vegetation pattern formed by the network of hedgerows and blocks of woodland; and
- e. Sense of separation between existing settlements.

1.2.46 Judgements regarding the susceptibility of landscape receptors to change have been informed by the criteria set out in **Table 1-2**.

Table 1-2: Criteria for Landscape Susceptibility

Classification	Description
Very High	The landscape receptor largely exhibits key landscape character attributes and there is very limited opportunity for change.
High	The landscape receptor largely exhibits key landscape character attributes and there is limited opportunity for change.
Medium	The landscape receptor exhibits some key landscape character attributes and there is some opportunity for change.
Low	The landscape receptor exhibits very few key landscape character attributes and there is an opportunity for change.
Very Low	The landscape receptor exhibits none of the key landscape character attributes and there is a high degree of opportunity for change.

Landscape Sensitivity

1.2.47 Landscape value and landscape susceptibility have been assessed separately and then combined to define the sensitivity of the landscape receptor, with reference to the criteria set out in **Table 1-3**.

Table 1-3: Assessment of Landscape Sensitivity

Sensitivity	Description
Very High	Landscapes of international or national value with distinctive and rare elements with a very high susceptibility to the Scheme.
High	<p>Landscape of national or regional value with distinctive elements and characteristics, with a high susceptibility to the Scheme. Typically, these would be landscape receptors:</p> <ul style="list-style-type: none"> • With distinctive elements and features making a positive contribution to character and sense of place. • Likely to be designated or are adjacent to the designated area but exhibit elements which underpin the designation, especially at the local scale. • Areas of special recognised landscape value through use (e.g. visitors), perception or historic and cultural associations. • Likely to contain features and elements that are rare and could not be replaced.
Medium	<p>Landscape of local or community value, with mostly common elements and characteristics, which by nature of their character would be able to accommodate some change. Typically, these would be landscape receptors:</p> <ul style="list-style-type: none"> • Comprised of mostly common elements and features, creating a generally unremarkable character but with some sense of place. • Locally designated, or value may be expressed through non-statutory local publications. • Containing some features of value through use, perception or historic and cultural associations. • Likely to contain some features and elements that could not be replaced.
Low	<p>Landscape of community or limited value and relatively inconsequential elements and characteristics, the nature of which is potentially tolerant of substantial change of the type proposed. Typically, these would be;</p> <ul style="list-style-type: none"> • Comprised of some features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place. • Not designated. • Containing few, if any, features of value through use, perception or historic and cultural associations. • Likely to contain few, if any, features and elements that could not be replaced.
Very Low	Landscape of very low or limited value, which is damaged, degraded or a substantially modified landscape pattern with few or no natural or original features remaining, such that it is tolerant of change.

Sensitivity of visual receptors

1.2.48 Paragraph 6.31 of GLVIA3 states that “*each visual receptor, meaning the particular person or group of people likely to be affected at a specific viewpoint, should be assessed in terms of both their susceptibility to change in views and*

visual amenity and also the value attached to particular views.” The sensitivity of visual receptors results from a combination of parameters, such as:

- a. The activity/occupation/ pastime of the receptors at particular locations;
- b. The extent to which their attention or interest may be focused on the views; and
- c. The visual amenity they experience.

1.2.49 Consideration has been given to the:

- a. Location, relative focus and orientation of particular views;
- b. Quality or importance of the existing view and its attractiveness / or scenic quality;
- c. Principal or secondary interest in that particular view;
- d. Static or sequential nature of views;
- e. Ability of the view to accommodate the type of development and the frequency; and
- f. Duration of the view.

Value attached to views

1.2.50 GLVIA3 stresses the importance of considering the value attached to views, for example in relation to heritage assets, or through planning designations. It provides a list of indicators of the value of views in paragraph 6.37, including:

- a. Appearance in guidebooks our tourist maps;
- b. Provision of facilities, such as parking places, sign boards and interpretive materials; and
- c. References in literature or art.

1.2.51 The assessment of the value of views is also informed by the location of the viewing place and the quality or designation of the existing elements in the view, with reference to the criteria set out in **Table 1-4** below.

Table 1-4: Classification of Views.

Classification	Description
Very High	Recognised or iconic views within nationally/internationally designated landscapes, such as National Parks, Areas of Outstanding Natural Beauty (AONB) and/or national/international landmarks with views recognised in planning policy and/or management plans.
High	Views or viewing places identified in regional strategies.
Medium	Views across high quality landscape which might include features of interest, such as landmarks, which may be identified in the Local Plan.
Low	Views of relatively common landscape elements, likely to be valued by the communities which experience the view.
Very Low	Views across poor quality landscape with a high degree of detracting or common elements.

Susceptibility of visual receptors to change

- 1.2.52 Visual sensitivity is also dependent upon the susceptibility of different receptors to changes in views and the visual amenity they experience at particular locations.
- 1.2.53 Page 113, paragraph 6.32 of GLVIA3 (Ref 1) adds that “*the susceptibility of different visual receptors to changes in views and visual amenity is mainly a function of:*”
- a. The occupation or activity of people experiencing the view at particular locations; and
 - b. The extent to which their attention or interest may therefore be focussed on the views and the visual amenity they experience at particular locations.”
- 1.2.54 GLVIA3 notes that visual receptors “*most susceptible to change*”, include residents and visitors engaged in outdoor recreation “*whose attention or interest is likely to be focused on the landscape and on particular views*” (para 6.33).
- 1.2.55 **Table 1-5** sets out the criteria referenced in determining the susceptibility of visual receptors to the change proposed.

Table 1-5: Classification of Visual Susceptibility.

Classification	Description
Very High	People visiting areas where the view is a very important part of the experience and specific to the reason for visiting the location and/or residents with open views from all windows across the façade of the house.
High	People visiting areas where the view is an important part of the experience and/or residents with open views from most windows across the façade of the house.
Medium	People passing through the area where views are relevant to the experience of the journey but are not specific to the reasons for visiting and/or residents with filtered views or views from only some windows across the façade of the house.
Low	People passing through the area on secondary roads, where the view is not relevant to the activity and may be softened or filtered and are short in duration.
Very Low	People working in buildings where the view is not relevant to the activity or passing through the area of main road and rail networks, such that views are very short in duration or screened.

1.3 Sensitivity of visual receptors

- 1.3.1 The sensitivity of visual receptors is based on professional judgement informed by the criteria in **Table 1-6**, considering the value attached to views and susceptibility of visual receptors to the change proposed.

Table 1-6: Classification of Sensitivity of Visual Receptors.

Classification	Description
Very High	A designated view or highly promoted view of a designated landscape or international or national feature.
High	Activity resulting in a particular interest or appreciation of the view (e.g. residents with principal private views, or people engaged in outdoor recreation whose attention is focused on the landscape and where people might visit purely to experience the view, such as promoted viewpoints) and/or a view of national value (e.g. within/towards a designated landscape).
Medium	Activity resulting in a general interest or appreciation of the view (e.g. residents or people engaged in outdoor recreation that does not focus on an appreciation of the landscape, outdoor workers, people in schools or other institutional buildings and hotels and people passing through the landscape on defined scenic routes) and/or a view of local or community value (e.g. suburban residential areas, or agricultural land or urban areas).
Low	Activity where interest or appreciation of the view is secondary to the activity or the period of exposure to the view is limited (e.g. people at work, motorists travelling through the area or people engaged in outdoor recreation that does not focus on an appreciation of the landscape) and/or a view of limited value (e.g. featureless agricultural landscape, poor quality urban fringe).
Very Low	Activity where interest or appreciation of the view is inconsequential (e.g. people at work with limited views out, or drivers of vehicles in cutting) and/or very low value of existing view (e.g. industrial areas or derelict land).

1.4 Magnitude of effects

1.4.1 GLVIA3 notes that magnitude is informed by combining considerations relating to the “*scale, extent and duration*” of effect (para 3.28). This includes the geographical extent of influence, the spatial extent of the effect, the level of integration of new features with existing elements, its duration and degree to which the effect is reversible.

1.4.2 The assessment considers the duration of effects, defined as short, medium and long term. Durations have been defined as:

- a. Short term: 0 – 2 years;
- b. Medium term: 2 – 10 years; and
- c. Long term: 10 years +.

Magnitude of landscape effects

1.4.3 The magnitude of landscape effects has been determined in consideration of the of size/scale, geographical extent of influence and its duration and reversibility.

1.4.4 The criteria set out in **Table 1-7** have been referred to in determining the magnitude of landscape effects.

Table 1-7: Criteria for Magnitude of Landscape effects

Classification	Description
High	Large alteration to the landscape receptor or may impact an extensive area or unique characteristics at a local level. May be longer term impacts, permanent or reversible.
Medium	Partial alteration to the landscape receptor or may impact a wide area or characteristics at a local level. May be medium term impacts, permanent or reversible.
Low	Slight alteration to the landscape receptor or may impact a restricted area and few key characteristics. May be short to medium term impacts, permanent or reversible
Very Low	Very slight alteration to the landscape receptor or may impact a limited area or no key characteristics. May be short term impacts, permanent or reversible.
None	No change to the landscape receptor.

Magnitude of visual effects

- 1.4.5 The magnitude of visual effect results from changes in the composition of views or changes to the overall visual amenity. It includes combinations of the degree of change, the extent over which the changes will be visible, the period of exposure to the view and reversibility or permanence of the change.
- 1.4.6 The magnitude of visual effects has also considered the extent of the view influenced, the elements of the Scheme that would be visible, the level of integration with existing elements and the reversibility of effects.
- 1.4.7 The criteria set out in **Table 1-8** have been referred to in determining the magnitude of visual effects.

Table 1-8: Criteria Descriptors for Visual Magnitude.

Classification	Description
High	The Scheme will cause a pronounced change to the composition of the view or may be viewed in the foreground or directly. May be longer term impacts, permanent or reversible and could include glint and glare effects.
Medium	The Scheme will cause a noticeable change to the composition of the view or may be viewed in the middle ground or indirectly. May be medium term impacts, permanent or reversible and could include glint and glare effects.
Low	The Scheme will cause an unobtrusive change in the composition of the view or may be viewed in the background or obliquely. May be short to medium term impacts, permanent or reversible and is not likely to include glint and glare effects.
Very Low	The Scheme will cause a barely perceptible change in the composition of the view or may be viewed in the background and very obliquely. May be short term impacts, permanent or reversible and would not include glint and glare effects.

None No change to the view.

1.5 Assessment of night time lighting effects

- 1.5.1 A qualitative assessment of night time lighting effects has been carried out for landscape and views. This approach was agreed with the Local Planning Authorities, represented by Wynne Williams Associates, at a meeting held on 16 December 2021.
- 1.5.2 The night time baseline has been described with reference to England’s Light Pollution and Dark Skies map (Ref 9) published by CPRE, The Countryside Charity. These maps are based on data gathered by a weather satellite. The data is split into nine categories (see **Table 1-9**) to distinguish between different light levels and the maps are divided into pixels, 400 metres x 400 metres, to show the amount of light shining up into the night sky from that area measured in nanowatts.

Table 1-9: Night time brightness

Classification	Brightness values in nanowatts/cm2/steradian (nw/cm2/sr)
Colour band 1	<0.25
Colour band 2	0.25 – 0.5
Colour band 3	0.5 – 1
Colour band 4	1 – 2
Colour band 5	2 – 4
Colour band 6	4 - 8
Colour band 7	8 - 16
Colour band 8	16 - 32
Colour band 9	>32

1.6 Significance of Effect

- 1.6.1 The significance of landscape and visual effects has been determined by considering the relationship between the sensitivity of the receptor and the magnitude of effect.
- 1.6.2 A guide to this relationship is set out in the matrix in Table 1-10. However, should professional judgement consider that the effect is different to that in the matrix, then a reasoned justification is presented in the LVIA. Similarly, where the matrix allows for different levels of significance of effect (e.g. major or moderate) a reasoned explanation is provided in the assessment as to the conclusion.

Table 1-10: Sensitivity of Receptor in Relation to Magnitude of Effect.

Sensitivity or value of resource/receptor	Magnitude of Effect				
	High	Medium	Low	Very Low	None
Very High	Major	Major or Moderate	Moderate or Minor	Minor or Negligible	Neutral
High	Major or Moderate	Moderate	Moderate or Minor	Minor or Negligible	Neutral
Medium	Major or Moderate	Moderate or Minor	Minor or Negligible	Negligible	Neutral
Low	Moderate or Minor	Minor	Minor or Negligible	Negligible	Neutral
Very Low	Minor	Minor or Negligible	Negligible	Negligible	Neutral

1.6.3 Following the classification of an effect, clear statements have been made within the LVIA as to whether that effect is significant or not significant.

1.6.4 As a general rule, major and moderate (adverse or beneficial) effects are considered to be significant, whilst minor, negligible and neutral effects are considered not to be significant.

1.7 Relationship to the Glint and Glare Assessment

1.7.1 The LVIA process includes a review of the conclusions of the Glint and Glare Assessment set out in **Chapter 16: Other Environmental Topics** of the ES [EN010118/APP/6.1]. These are considered as part of the assessment of the magnitude of landscape and visual effects as set above.

1.8 Relationship to Residential Visual Amenity

1.8.1 The LVIA has assessed the potential visual effects to different types of visual receptor, including residents, i.e., private views.

1.8.2 With reference to the Landscape Institute’s Technical Guidance Note 2/19: ‘Residential Visual Amenity Assessment’, the Residential Visual Amenity Threshold is considered as to whether:

“the effect of the development on Residential Visual Amenity of such nature and / or magnitude that it potentially affects ‘living conditions’ or Residential Amenity.”

1.8.3 The guidance is based upon a ‘four’ stage approach. Stages 1 to 3 accord with the above LVIA methodology, whereby, in line with GLVIA3, visual receptors are identified, along with the magnitude of impact and the significance of effect.

1.8.4 The fourth step is a more detailed examination of views from residential properties, where appropriate, when the highest ‘significance of effect’ levels are identified via stages 1 to 3. Although, as stated by the guidance, there are

no '*hard and fast rules*' as to making a judgement on the Residential Visual Amenity Threshold.

- 1.8.5 Therefore, if at year 15 of operation, i.e., post the establishment of the proposed mitigation, there are residential receptors predicted to experience significant adverse effects, a RVAA would be undertaken. However, as the LVIA has not identified the likelihood of significant adverse effects at year 15 of operation, RVAA has not been carried out.

1.9 Methodology for the preparation of photomontages

- 1.9.1 Visualisations of the Scheme have been prepared which integrate the Scheme into existing views using photographs taken on site. These visualisations have been prepared in accordance with Landscape Institute Technical Guidance Note 06/19: Visual Representation of Development Proposals and represent 'Type 3' visualisations.
- 1.9.2 Photographs have been captured using a digital camera with a field of view to accommodate the necessary scope of the Scheme and relevant context. The camera has been positioned 1.60m above ground level and mounted on a tripod with a Manfrotto head, sliding plate and levelling base.
- 1.9.3 A professional surveyor used GPS equipment to record the camera position as well as the focal length, date and time of the photograph.
- 1.9.4 The camera outputs are a standard compressed file-type (JPEG). The compressed photographs have then been processed and stitched using the software package Hugin; which re-projects and blends multiple source images into panoramas with exposure, vignetting and white balance correction.
- 1.9.5 Details have been added using CAD data to a three-dimensional computer model of the Scheme to achieve a realistic representation of the Scheme.
- 1.9.6 Once this model has been created it has been positioned in 3D using the general arrangement drawings.
- 1.9.7 A virtual camera has then been placed within the scene at the correct surveyed location. The virtual 3D camera was rotated to the correct position with the captured photography as a backplate and the survey points have been used to verify the alignment.
- 1.9.8 To obtain photo-realism, physically accurate lighting is required alongside materials and textures. V-RaySun and V-RaySky reproduce the real-life Sun and Sky environment of the earth. Both are coded so that they change their appearance depending on several factors, such as the direction of the V-RaySun; which was dynamically linked and georeferenced to the real-world position of the site, the time, day and month.
- 1.9.9 Using this lighting system, alongside the physically accurate material properties, the software calculates the effects of the sun and sky conditions on the appearance of the Scheme, illustrating the anticipated effects.
- 1.9.10 Once the rendering stage was complete, the images have been brought into Adobe Photoshop to superimpose the Scheme onto the digital images of the Order limits. The details in the foreground, such as trees, buildings or topography have then been overlaid as masks; ensuring the depth of the

various items was represented correctly. If required, the rendered image has been be further edited to accurately match the colour, saturation and environmental effects shown in the original photograph.

1.10 References

- Ref 1 Landscape Institute and the Institute of Environmental Management and Assessment. (2013). Guidelines for Landscape and Visual Impact Assessment 3rd Edition.
- Ref 2 Natural England (2014). An Approach to Landscape Character Assessment.
- Ref 3 Landscape Institute (2021). The Landscape Institute's Assessing landscape value outside national designations Technical Guidance Note 02/21.
- Ref 4 Landscape Institute (2020). Infrastructure Technical Guidance Note 04/20.
- Ref 5 Landscape Institute (2017). Tranquillity Technical Guidance Note.
- Ref 6 Landscape Institute (2019) Visual Representation of Development Proposals – Technical Guidance Note 06/19.
- Ref 7 Landscape Institute (2019). Residential Visual Amenity Assessment.
- Ref 8 CPRE (2007) Tranquillity Map.
- Ref 9 CPRE (2007) England's Light Pollution and Dark Skies.