EN010170 Green Hill Solar

Appendices to Landscape and Related Matters Statement for Deadline 1 Written Representations November 2025 Carly Tinkler CMLI for Stop Green Hill Solar

The following documents are appendices to the Landscape and Related Matters Statement (November 2025) produced for Stop Green Hill Solar (SGHS) by Carly Tinkler CMLI (doc ref SGHS/CT.1). The number attributed to this document is SGHS/CT.3.

# Appendices CT-A – CT-K

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# Appendix CT-A

## Tables of Criteria & Matrices for Landscape & Visual Assessment

## *Table 1: Criteria for Judging Levels of Landscape Quality*

| Level of Quality | Definition |
|---|---|
| **Very High** | • Landscapes of an 'awe-inspiring' or 'sublime' nature and which are important and valued on an international and national level (DMRB)<br>• Unspoilt areas comprising a strong, clear and highly aesthetically-pleasing composition of highly characteristic landscape elements and features in excellent condition and health, intact and distinctive<br>• Excellent representation of the landscape area / type<br>• Very high level of management, or care, or pristine natural / semi-natural environment<br>• Exceptional scenic integrity<br>• Very strong sense of place<br>• Negligible or no atypical or incongruous features or detractors |
| **High** | • Very attractive landscapes which are of high value nationally and can be defined as highly scenic (DMRB)<br>• Areas with components combined in an aesthetically pleasing composition, in very good condition and health<br>• Very good representation of the landscape area / type<br>• High level of management, or care, or natural / semi-natural environment in very good form and health<br>• Very good scenic integrity<br>• Strong sense of place<br>• Few atypical or incongruous features or detractors |
| **Moderate** | • Good landscape containing areas that, although still attractive, have less significant and more common landscape features (DMRB)<br>• Areas of some value for their landscapes, components combined in an aesthetically pleasing composition but showing signs of erosion and loss, in good to fair condition and health<br>• Good to fair representation of the landscape area / type<br>• Good to fair level of management, environment in good to fair form and health<br>• Good to fair scenic integrity<br>• Some loss of, or change to, intrinsic sense of place<br>• Some atypical or incongruous features or detractors |
| **Low** | • Ordinary landscape containing areas that have only common landscape features and some intrusive elements such as conspicuous infrastructure with scope for improvement in management (DMRB)<br>• Areas of limited landscape value, disturbed and lacking coherence and structure. Limited aesthetically-pleasing composition. Signs of urbanisation and / or erosion, characteristic landscape elements and features degraded and / or lost. Poor condition / health<br>• Limited representation of the landscape area / type<br>• Limited management, or care, environment in fair to poor form and health<br>• Poor scenic integrity<br>• Little if any sense of place<br>• Several atypical or incongruous features or detractors |

| Level of Quality | Definition |
|---|---|
| **Very Low** | • Poor landscape with areas that contain frequent detracting aspects and/or lack of management which results in a degraded landscape with very few valued features (DMRB)<br>• Areas with few or no valued landscape components or comprising degraded and / or lost characteristic elements and features, making negative contribution to aesthetic composition<br>• Poor or no representation of the landscape area / type<br>• Little or no management, or care, environment in very poor form and health<br>• Little or no scenic integrity<br>• Negative sense of place<br>• Widespread atypical or incongruous features or detractors |

## *Table 2: Criteria for Judging Levels of Landscape Value*

| Level of Value | Definition |
|---|---|
| **Very High** | • 'Outstanding' landscapes (ELC)<br>• Internationally and / or nationally-designated landscapes e.g. World Heritage Sites, National Parks, AONBs<br>• Presence of internationally and / or nationally-designated areas / features of landscape, nature conservation, archaeological, historic, geological and / or other importance e.g. SACs, SSSIs, Scheduled Monuments, Grade I and / or II* listed buildings, Registered Historic Parks and Gardens, Local Geodiversity Sites<br>• Significant wider landscape / visual function e.g. Green Belt, context / setting of heritage asset, contribution to character of settlement of international or national importance<br>• Landscapes in excellent condition and / or of very high quality as defined by appropriate criteria<br>• Significant cultural associations<br>• Exceptional representation of landscape area / type / characteristics and / or rare<br>• Exceptional aesthetic and perceptual attributes and qualities e.g. significant scenic beauty, iconic views, very distinctive sense of place, very high degree of wildness / remoteness, tranquillity<br>• No detractors present<br>• The quality / qualities of, and / or features in, the landscape are likely to be the primary purpose of the visit<br>• Significant contribution to wider public amenity, access and recreation e.g. national trails, Open Access Land<br>• Significant Green Infrastructure assets |
| **High** | • Landscapes between 'Outstanding' and 'Everyday' (ELC)<br>• Regionally / locally-designated landscapes e.g. Areas of Great Landscape Value (AGLV) which may be subject of strategy and / or guidance<br>• Presence of regionally / countywide-level designated areas / features of landscape, nature conservation, archaeological, historic, geological and / or other importance e.g. Country Parks, TPOs, National Forest Inventory, Priority Habitat Inventory sites, Local Wildlife Sites / Local Nature Reserves, Grade II Listed Buildings, Conservation Areas, Unregistered Historic Parks and Gardens, SMR / HER. Also National Trust land<br>• Important wider, or significant local, landscape / visual function e.g. context / setting of heritage asset, contribution to character of settlement of regional importance, green gap, buffer zone etc.<br>• Landscapes in very good condition and / or of high quality as defined by appropriate criteria<br>• Important cultural associations<br>• Very good representation of landscape area / type / characteristics and / or uncommon<br>• Very good aesthetic and perceptual attributes and qualities e.g. high degree of scenic beauty, fine / key views, distinctive sense of place, high degree of wildness / remoteness, tranquillity<br>• Negligible / few detractors present<br>• The quality / qualities of, and / or features in, the landscape are likely to be one of the main reasons for the visit |

| Level of Value | Definition |
|---|---|
| | • Important contribution to wider public amenity, access and recreation e.g. long-distance / themed trails, well-used public rights of way, Heritage Coast, Public Open Space / Local Green Space. May be protected by / subject of planning policy<br>• Important wider, or significant local Green Infrastructure assets |
| **Moderate** | • 'Everyday' landscapes (ELC)<br>• Undesignated landscapes although may be subject of strategy and / or guidance<br>• Presence of undesignated, 'informally' designated and / or locally-important areas / features of landscape, nature conservation, archaeological, historic, geological and / or other interest<br>• Important local landscape / visual function e.g. context / setting of heritage asset, contribution to character of settlement, green gap, buffer zone etc.<br>• Landscapes in good to fair condition and / or of moderate quality as defined by appropriate criteria but good potential for improvement<br>• Important local cultural associations<br>• Good to fair representation of landscape area / type / characteristics but common<br>• Good to fair aesthetic and perceptual attributes and qualities e.g. moderate degree of scenic beauty, local key views, moderate sense of place, moderate degree of wildness / remoteness, tranquillity<br>• Some detractors present<br>• The quality / qualities of, and / or features in, the landscape are unlikely to be one of the main reasons for the visit, but make a positive contribution to the experience<br>• Important contribution to local public amenity, access and recreation e.g. well-used public rights of way, green open spaces, common land<br>• Good local Green Infrastructure assets |
| **Low** | • Landscapes between 'Everyday' and 'Degraded' (ELC)<br>• Undesignated landscapes unlikely to be subject of strategy and / or guidance (unless for restoration)<br>• Few if any areas / features of landscape, nature conservation, archaeological, historic, geological and / or other interest<br>• Little or no local landscape / visual function<br>• Landscapes in fair to poor condition and / or of low quality as defined by appropriate criteria but some potential for improvement<br>• Few if any cultural associations<br>• Fair to poor representation of landscape area / type / characteristics and common<br>• Few if any aesthetic and perceptual attributes and qualities: little sense of place, little or no sense of wildness / remoteness, tranquillity<br>• Several detractors present<br>• The quality / qualities of, and / or features in, the landscape are unlikely to be a reason for visiting<br>• Little or no contribution to public amenity, access and recreation<br>• Few Green Infrastructure assets |

| Level of Value | Definition |
|---|---|
| **Very Low** | • 'Degraded' landscapes (ELC)<br>• Undesignated landscapes, and not subject of strategy and / or guidance (unless for restoration)<br>• No areas / features of landscape, nature conservation, archaeological, historic, geological and / or other interest<br>• Negligible or no landscape / visual function<br>• Landscapes in very poor condition and / or of very low quality as defined by appropriate criteria – may be contaminated land. Situation likely to be permanent, and very little if any potential for improvement<br>• No cultural associations<br>• Poor representation of landscape area / type / characteristics<br>• Negative aesthetic and perceptual attributes and qualities: no sense of place, high levels of landscape and visual disturbance<br>• Widespread detractors present / dominant<br>• The quality / qualities of, and / or features in, the landscape may discourage people from visiting<br>• No contribution to public amenity, access and recreation<br>• Very few or no Green Infrastructure assets |

## *Table 3: Criteria for Judging Levels of Landscape Susceptibility to Change*

| Level of Susceptibility | Definition |
|---|---|
| **Very High** | • The landscape is of a very large scale and / or there is a negligible level of containment, resulting in a significant degree of interaction between landform, topography, vegetation cover, field pattern and built form<br>• There is no existing reference or context within the landscape to the type of change / development proposed<br>• Detracting features are not present in the area<br>• The majority of the existing landscape characteristics / elements / features of value (e.g. ancient woodland, mature / veteran trees, traditional orchards etc.) could not be replaced / substituted and their loss could not be compensated for<br>• Very limited or no opportunities for mitigation<br>• The landscape receptor has a very low level of ability to tolerate the nature / scale of change / development proposed: permanent serious negative consequences in terms of the maintenance of the baseline situation<br>• The proposed change / development would not comply with relevant national planning policies, guidance, and / or strategies |
| **High** | • The landscape is of a large scale and / or there is a low level of containment, resulting in a high degree of interaction between landform, topography, vegetation cover, field pattern and built form<br>• There is very limited existing reference or context within the landscape to the type of change / development proposed<br>• Few detracting features in the area and where present, these have little influence on the character and experience of the landscape<br>• Many of the existing landscape characteristics / elements / features of value would not be easy to replace or substitute, and it is unlikely that loss could be compensated for<br>• Some potential for mitigation and enhancement<br>• The landscape receptor has a low level of ability to tolerate the nature / scale of change / development proposed: long-term / permanent consequences of concern in terms of the maintenance of the baseline situation<br>• The proposed change / development is unlikely to comply with relevant national planning policies, guidance, and / or strategies |
| **Moderate** | • The landscape is of a medium scale and / or there is a moderate level of containment, resulting in a moderate degree of interaction between landform, topography, vegetation cover, field pattern and built form<br>• There is some existing reference or context within the landscape to the type of change / development proposed<br>• Some detracting features and / or major infrastructure are present in the area, and these have a noticeable influence on the character and experience of the landscape<br>• Existing landscape characteristics / elements / features of limited value and could potentially be replaced / substituted, and / or loss satisfactorily compensated for<br>• Good potential for mitigation and enhancement |

| | |
|---|---|
| | • The landscape receptor has a moderate level of ability to tolerate the nature / scale of change / development proposed: some concern in terms of the maintenance of the baseline situation without mitigation<br>• The proposed change / development may be in conflict with some relevant national planning policies, guidance, and / or strategies, but may comply with others |
| **Low** | • The landscape is small scale and / or has a high level of containment, resulting in only a slight degree of interaction between landform, topography, vegetation cover, field pattern and built form<br>• There are many existing references within the landscape to the type of development / change proposed<br>• Several detractors present which have a negative influence on the character and / or experience of the landscape<br>• Few / no landscape characteristics / elements / features of value are present or, where they are present, they can easily be replaced / substituted and / or loss could be satisfactorily compensated for<br>• The landscape receptor has a high level of ability to tolerate the nature / scale of change / development proposed: limited concern in terms of the maintenance of the baseline situation<br>• Very good opportunities for mitigation and enhancement<br>• The proposed change / development is unlikely to be in conflict with relevant national planning policies, guidance, and / or strategies. The site may be allocated for the type of development proposed |
| **Very Low** | • The landscape is of such a small scale and / or has such a high level of containment, that there is little or no interaction between landform, topography, vegetation cover, field pattern and built form<br>• The landscape displays the characteristics of the type of development / change proposed<br>• Widespread detractors present which negatively influence the character and / or experience of the landscape<br>• No landscape characteristics / elements / features of value are present<br>• The landscape receptor has a very high level of ability to tolerate the nature / scale of change / development proposed: no concern in terms of the maintenance of the baseline situation<br>• Change / development could result in noticeable improvements to the area<br>• The proposed change / development is likely to comply with relevant national planning policies, guidance, and / or strategies. The site may be allocated for the type of development proposed or for restoration |

## *Table 4: Matrix for Evaluating Levels of Landscape Sensitivity*

| | | **Level of Landscape Susceptibility to Change** | | | | |
|---|---|---|---|---|---|---|
| | | **Very High** | **High** | **Moderate** | **Low** | **Very Low** |
| **Level of Landscape Value** | **Very High** | Very High | High to Very High | High | Medium to High | Medium |
| | **High** | High to Very High | High | Medium to High | Medium | Low to Medium |
| | **Moderate** | High | Medium to High | Medium | Low to Medium | Low |
| | **Low** | Medium to High | Medium | Low to Medium | Low | Very Low to Low |
| | **Very Low** | Medium | Low to Medium | Low | Very Low to Low | Very Low |

## *Table 5: Criteria for Judging Levels of Magnitude of Effect (Landscape Character)*

| Level of Magnitude | Definition |
|---|---|
| **Very Large Adverse** | • Major alteration to, or complete loss of, key elements, features, characteristics and functions of the baseline condition<br>• The size, scale and / or geographical extent of change is considered very large due to the extent and proportion of loss of, or change to, existing landscape components<br>• Effects likely to be experienced at a very large scale, influencing several character areas or types<br>• Major alteration to, or complete loss of, key elements, features, characteristics and functions of the baseline condition, and / or the addition of highly uncharacteristic, conspicuous elements, features and / activities, would result in major alteration to, or complete loss of, aesthetic and / or perceptual qualities<br>• The duration of effect would be considered permanent and irreversible |
| **Large Adverse** | • Noticeable alteration to, or significant loss of, key elements, features, characteristics and functions of the baseline condition<br>• The size, scale and / or geographical extent of change is considered large due to the extent and proportion of loss of, or change to, existing landscape components<br>• Effects likely to be experienced at a large scale, influencing the character area and / or type within which the change is proposed<br>• Noticeable alteration to, or loss of, key elements, features, characteristics and functions of the baseline condition, and / or the addition of uncharacteristic, conspicuous elements, features and / activities, would result in noticeable alteration to, or loss of, aesthetic and / or perceptual qualities<br>• The duration of effect would be considered long-term / permanent and probably irreversible |
| **Moderate Adverse** | • Partial alteration to, or loss of, key elements, features, characteristics and functions of the baseline condition<br>• The size, scale and / or geographical extent of change is considered medium due to the extent and proportion of loss of, or change to, existing landscape components<br>• Effects likely to be experienced at a moderate scale, influencing the character type within which the change is proposed but at a local level<br>• Partial alteration to, or loss of, key elements, features, characteristics and functions of the baseline condition, and / or the addition of elements, features and / activities which are not characteristic in the area, would result in partial alteration to, or loss of, aesthetic and / or perceptual qualities<br>• The duration of effect would be considered long-term / permanent and very difficult to reverse in practical terms |

| Level of Magnitude | Definition |
|---|---|
| **Small Adverse** | • Minor alteration to key elements, features, characteristics and functions of the baseline condition<br>• The size, scale and / or geographical extent of change is considered small due to the extent and proportion of loss of, or change to, existing landscape components<br>• Effects likely to be experienced at a small scale, influencing the landscape within which the change is proposed at a local level<br>• Minor alteration to, or loss of, key elements, features, characteristics and functions of the baseline condition, and / or the addition of elements, features and / activities which are not characteristic in the area, would result in minor alteration to aesthetic and / or perceptual qualities<br>• The duration of effect may be considered long-term / permanent but is potentially reversible |
| **Negligible Adverse** | • Barely discernible alterations to key elements, features, characteristics and functions of the baseline condition<br>• The size, scale and / or geographical extent of change is considered very small due to the extent and proportion of loss of, or change to, existing landscape components<br>• Effects likely to be experienced at a very small scale, with no influence beyond the site and its immediate surroundings on the landscape within which the change is proposed<br>• Barely discernible alterations to key elements, features, characteristics and functions of the baseline condition, and / or the addition of elements, features and / activities which are entirely characteristic in the area, would result in barely discernible alteration to aesthetic and / or perceptual qualities<br>• The duration of effect may be considered temporary (i.e. short- or medium-term); but may also be long-term / permanent. Some effects potentially reversible |
| **Neutral** | • No change to the baseline condition, or an equal balance of negative / positive effects |
| **Negligible Beneficial** | • Barely discernible improvements to key elements, features, characteristics and functions of the baseline condition<br>• The size, scale and / or geographical extent of improvement is considered very small due to the extent and proportion of new landscape components<br>• Beneficial effects likely to be experienced at a very small scale, with no influence beyond the site and its immediate surroundings on the landscape within which the improvement is proposed<br>• Barely discernible improvements to existing, or addition of new, key elements, features, characteristics and functions of the baseline condition would result in barely discernible improvements in aesthetic and / or perceptual qualities<br>• Some / all improvements are temporary (i.e. short- or medium-term) |

| Level of Magnitude | Definition |
|---|---|
| **Small Beneficial** | • Small but noticeable improvements to key elements, features, characteristics and functions of the baseline condition<br>• The size, scale and / or geographical extent of improvement is considered small due to the extent and proportion of new landscape components<br>• Beneficial effects likely to be experienced at a small scale, influencing the local landscape<br>• Small but noticeable improvements to existing, or addition of new, key elements, features, characteristics and functions of the baseline condition would result in discernible improvements in aesthetic and / or perceptual qualities<br>• Improvements are medium- to long-term |
| **Moderate Beneficial** | • Noticeable improvements to key elements, features, characteristics and functions of the baseline condition<br>• The size, scale and / or geographical extent of improvement is considered medium due to the extent and proportion of new landscape components<br>• Beneficial effects likely to be experienced at a moderate scale, influencing the character type within which the change is proposed but at a local level<br>• Noticeable improvements to existing, or addition of new, key elements, features, characteristics and functions of the baseline condition would result in noticeable improvements in aesthetic and / or perceptual qualities<br>• Improvements are long-term / permanent |
| **Large Beneficial** | • Major improvements to key elements, features, characteristics and functions of the baseline condition<br>• The size, scale and / or geographical extent of improvement is considered large due to the extent and proportion of new landscape components<br>• Beneficial effects likely to be experienced at a large scale, influencing the character area and / or type within which the change is proposed<br>• Major improvements to existing, or addition of new, key elements, features, characteristics and functions of the baseline condition would result in considerable improvements in aesthetic and / or perceptual qualities<br>• Improvements are long-term / permanent |
| **Very Large Beneficial** | • Substantial improvements to key elements, features, characteristics and functions of the baseline condition<br>• The size, scale and / or geographical extent of improvement is considered very large due to the extent and proportion of new landscape components<br>• Beneficial effects likely to be experienced at a very large scale, influencing several character areas or types<br>• Substantial improvements to existing, or addition of new, key elements, features, characteristics and functions of the baseline condition would result in substantial improvements in aesthetic and / or perceptual qualities<br>• Improvements are permanent |

## *Table 6: Matrix for Evaluating Overall Levels of Landscape Effects*

**NOTE 1:** The level of Magnitude of Effect can be expressed as Adverse or Beneficial, and the overall Level of Effect can be expressed as Negative or Positive.

**NOTE 2:** If the Magnitude of Effect is Neutral or Nil (ie 'No Change'), all effects will be Neutral or Nil

| | | **Sensitivity of Receptor** | | | | |
|---|---|---|---|---|---|---|
| | | **Very High** | **High** | **Medium** | **Low** | **Very Low** |
| **Level of Magnitude of Effect** | **Very Large** | Substantial | Major to Substantial | Major | Moderate to Major | Moderate |
| | **Large** | Major to Substantial | Major | Moderate to Major | Moderate | Moderate to Minor |
| | **Moderate** | Major | Moderate to Major | **Moderate** | Moderate to Minor | Minor |
| | **Small** | Moderate to Major | Moderate | Moderate to Minor | Minor | Minor to Negligible |
| | **Negligible** | Moderate | Moderate to Minor | Minor | Minor to Negligible | Negligible |

## *Table 7: Criteria for Judging Levels of Visual Value*

| Level of Visual Value | Criteria |
|---|---|
| **Very High** | • Views from, or towards, designated landscapes and / or features of international and national importance (e.g. World Heritage Sites, National Parks, AONBs, Registered Historic Parks and Gardens, Scheduled Monuments, Grade I or II* Listed Buildings etc.) especially where contributing to the significance of an asset / feature<br>• View is of outstanding scenic beauty and very high quality<br>• View makes a highly important contribution to understanding of landscape function / contribution<br>• Likely to be the subject of planning policy and / or guidance / protected views<br>• Views from landscapes / viewpoints within highly popular visitor attractions / tourist destinations, and / or from national trails, used by very large numbers of people<br>• Views with social / cultural / historic associations (e.g. in art and literature, or an historically-important vista over a battlefield) of international / national importance |
| **High** | • Views from within, or towards, designated landscapes and / or features of regional or countywide importance (e.g. Areas of Great Landscape Value (AGLV), Country Parks, Conservation Areas, Grade II listed buildings, National Trust land etc.), especially where contributing to the significance of an asset / feature<br>• View is of high scenic beauty and high quality<br>• View makes an important contribution to understanding of landscape function / contribution<br>• Views from well-used and popular visitor attractions / tourist destinations, including long-distance / themed trails, Heritage Coasts, Public Open Spaces / Local Green Spaces, used by relatively large numbers of people<br>• Views with social / cultural / historic associations of countywide importance<br>• Views in which receptors have a proprietary interest, including people living in residential properties |
| **Moderate** | • Views from within, or towards, undesignated landscapes and / or features of local importance<br>• View is of moderate scenic beauty and moderate quality<br>• View makes a moderate contribution to understanding of landscape function / contribution<br>• Views from locally-popular recreation areas / green open spaces / public rights of way, but not used by many visitors<br>• Views with social / cultural / historic associations of local importance |
| **Low** | • Views from within, or towards, undesignated landscapes and / or features of site-wide importance<br>• View is of low scenic beauty and low quality<br>• View makes a very limited contribution to understanding of landscape function / contribution<br>• Views from landscapes / viewpoints which are not particularly popular or recognised as being destinations in their own right, including infrequently used rights of way<br>• Views with no social / cultural / historic associations |

| | |
|---|---|
| **Very Low** | • Views from, or towards, undesignated landscapes and / or features of no importance<br>• View is of poor scenic beauty / quality - landscape may be permanently degraded |

## *Table 8: Criteria for Judging Levels of a Landscape's Visual Susceptibility to Change*

| Level of Visual Sensitivity | Definition |
|---|---|
| **Very High** | • Highly visible in wider area<br>• Forms part of exceptional / iconic / very highly valued views<br>• Internationally / nationally important visual function (context, setting, gateway, gap, screen, buffer, transition zone, skyline, panorama, vista, focal point, cultural association etc.)<br>• Very open to public or private views of the countryside or open space which are significant<br>• Development would create unacceptable visual intrusion into the wider landscape that almost certainly could not be mitigated |
| **High** | • Visible in wider area<br>• Highly visible in local area<br>• Forms part of wider important / highly valued views<br>• Forms part of views of significant local value<br>• Important wider visual function<br>• Significant local visual function<br>• Very open to public or private views of the countryside or open space which are of wider importance<br>• Development would be uncharacteristically conspicuous in the wider area and mitigation unlikely to reduce adverse effects<br>• Development would create unacceptable visual intrusion into the local landscape that almost certainly could not be mitigated |
| **Moderate** | • Not visible from wider area or of no influence<br>• Locally visible but limited influence<br>• Views are of some wider importance but there is scope for mitigating potential adverse visual effects<br>• Locally highly-valued views<br>• Limited wider visual function<br>• Important local visual function<br>• Partially open to public or private views of the countryside or open space which are of wider importance<br>• Open to views public or private views of the countryside or open space which are of local importance<br>• Development likely to be perceptible in the wider area but would not significantly alter the balance of features or elements within the existing view<br>• Development would be uncharacteristically conspicuous in the local area and mitigation unlikely to reduce adverse effects |

| Level of Visual Sensitivity | Definition |
|---|---|
| **Low** | • Not visible from wider area<br>• Limited local visibility<br>• Views of limited importance<br>• Development could be integrated into the land- / town- / villagescape although possibly only with mitigation<br>• Site is fairly well-screened from public and private views<br>• Development may be discernible in the wider area but would not result in loss of, or change to, important views or wider visual amenity<br>• Development likely to be perceptible in the local area but would not significantly alter the balance of features or elements within the existing view |
| **Very Low** | • Not visible from wider area<br>• Little or no local visibility<br>• Views of little or no importance<br>• Development would not lead to unacceptable visual intrusion into the landscape, or adverse effects on the settlement, with or without mitigation<br>• Site is very well-screened from public and private views<br>• Development would not be discernible or would enhance views or existing visual amenity |

## *Table 9: Criteria for Judging Levels of Visual Receptors' Susceptibility to Change*

| Level of Susceptibility | Criteria |
|---|---|
| **Very High** | • Receptors (tourists / visitors) within, or looking towards, internationally- or nationally-designated landscapes, areas and features such as World Heritage Sites, National Parks, Areas of Outstanding Natural Beauty, Registered Historic Parks and Gardens, Scheduled Ancient Monuments, Grade I and II* listed buildings and other places where the landscape / feature is the main reason for the visit<br>• People using national trails and other nationally-designated routes where the view is likely to be the focus of attention<br>• People living in residential properties |
| **High** | • Receptors (tourists / visitors) within, or looking towards, landscapes, areas and features with regional / countywide designations e.g. Areas of Great Landscape Value (AGLV), Country Parks, Conservation Areas, Grade II listed buildings, National Trust land etc. and other places (such as Open Access Land) where the landscape / feature is part of the reason for the visit<br>• People using long-distance footpaths / scenic routes / themed trails / engaged in outdoor recreation (e.g. walkers, riders, cyclists, boat users, motorists), whose attention may be focused on the landscape and / or particular views, and / or for whom the view is a factor in the enjoyment of the activity<br>• Communities living in areas where the landscape setting makes a highly important contribution to visual amenity |
| **Moderate** | • Receptors within, or looking towards, undesignated landscapes, areas and features of local importance, and in places where the landscape / feature is not necessarily part of the reason for the visit<br>• People using local public rights of way / engaged in outdoor recreation whose attention is unlikely to be focused on the landscape and / or particular views, and / or for whom the view is not necessarily a factor in the enjoyment of the activity<br>• People staying in hotels and healthcare institutions who are likely to appreciate and / or benefit from views of their surroundings<br>• People working in premises where the views are likely to make an important contribution to the setting, and / or to the quality of working life |
| **Low** | • Receptors in commercial and industrial premises, schools, playing fields etc. where the view is not central to the use<br>• People using main roads, rail corridors, infrequently used / inaccessible public rights of way and likely to be travelling for a purpose other than to enjoy the view |
| **Very Low** | • People moving past the view often at high speed (e.g. on motorways and main line railways) and with little or no focus on or interest in the landscape through which they are travelling |

***Table 10: Matrix for Evaluating Levels of Visual and Visual Receptor Sensitivity***

| | | **Level of Visual Susceptibility to Change** | | | | |
|---|---|---|---|---|---|---|
| | | **Very High** | **High** | **Moderate** | **Low** | **Very Low** |
| **Level of Visual Value** | **Very High** | Very High | High to Very High | High | Medium to High | Medium |
| | **High** | High to Very High | High | Medium to High | Medium | Low to Medium |
| | **Moderate** | High | Medium to High | Medium | Low to Medium | Low |
| | **Low** | Medium to High | Medium | Low to Medium | Low | Very Low to Low |
| | **Very Low** | Medium | Low to Medium | Low | Very Low to Low | Very Low |

## *Table 11: Criteria for Judging Levels of Magnitude of Effect (Views & Visual Amenity)*

| Level of Magnitude | Definition |
|---|---|
| **Very Large Adverse** | • Significant and substantial deterioration in, or a significant and substantial change to, a very large proportion of the existing view<br>• Complete loss of, or substantial change to, site's visual function / contribution<br>• The change may be noticeable over a large geographical area, or substantial over a more limited area<br>• Development, or a large part of it, would be a dominant new component and / or focus in the view, and would have a strongly-defining influence on it<br>• The duration of effect would be considered permanent and irreversible |
| **Large Adverse** | • Development would cause a highly noticeable deterioration in, or a highly noticeable change to, a large proportion of the existing view, or significant deterioration in or a significant change to a smaller proportion of the existing view<br>• Noticeable loss of, or change to, site's visual function / contribution<br>• Development, or a large part of it, would be a significant new component and / or focus in the view, and would have a defining influence on it<br>• The duration of effect would be considered long-term / permanent and probably irreversible |
| **Moderate Adverse** | • Development would cause a visible deterioration in, or change to, a large proportion of the existing view, or highly noticeable deterioration in, or change to, a smaller proportion of the existing view<br>• Partial loss of, or change to, site's visual function / contribution<br>• Development appears at odds with local landscape character and would form an apparent element within local views<br>• The duration of effect would be considered long-term / permanent and very difficult to reverse in practical terms |
| **Small Adverse** | • Development would cause a small deterioration in, or change to, a large proportion of the existing view, or a visible deterioration in, or change to, a smaller proportion of the existing view<br>• Small change to site's visual function / contribution<br>• Development would form a minor constituent of the view, being partially-visible, or at a sufficient distance to be a limited component of a view<br>• The duration of effect may be considered long-term / permanent but is potentially reversible |
| **Negligible Adverse** | • Development would cause a barely-perceptible deterioration in, or change to, the existing view<br>• Barely-perceptible change to site's visual function / contribution<br>• The duration of effect may be considered temporary (i.e. short- or medium-term); but if long-term / permanent, effects potentially reversible (and may be likely to happen) |
| **Neutral** | • No change to the existing view, or equal balance of negative and positive effects |

| Level of Magnitude | Definition |
|---|---|
| **Negligible Beneficial** | • Development would result in a barely-discernible improvement in the existing view<br>• Improvements are temporary (i.e. short- or medium-term) |
| **Small Beneficial** | • Development would result in a small improvement in a large proportion of the existing view, or a noticeable improvement to a smaller proportion of the existing view<br>• Small improvement to site's visual function / contribution<br>• Development would improve a small part of the view<br>• Improvements are long-term / permanent |
| **Moderate Beneficial** | • Development would result in a noticeable improvement to a large proportion of the existing view, or locally-important improvement to a smaller proportion of the existing view<br>• Improvements are long-term / permanent |
| **Large Beneficial** | • Development would result in an important improvement to a large proportion of the existing view, or significant improvement to a smaller proportion of the existing view<br>• Improvements are long-term / permanent |
| **Very Large Beneficial** | • Development would result in a significant improvement to a large proportion of the existing view<br>• Improvements are permanent |

## *Table 12: Matrix for Determining Overall Levels of Visual Effects*

**NOTE 1:** The level of Magnitude of Effect can be expressed as Adverse or Beneficial, and the overall Level of Effect can be expressed as Negative or Positive.

**NOTE 2:** If the Magnitude of Effect is Neutral / Nil (ie 'No Change'), all effects will be Neutral or Nil

| | | **Sensitivity of Receptor** | | | | |
|---|---|---|---|---|---|---|
| | | **Very High** | **High** | **Medium** | **Low** | **Very Low** |
| **Level of Magnitude of Effect** | **Very Large** | Substantial | Major to Substantial | Major | Moderate to Major | Moderate |
| | **Large** | Major to Substantial | Major | Moderate to Major | Moderate | Moderate to Minor |
| | **Moderate** | Major | Moderate to Major | **Moderate** | Moderate to Minor | Minor |
| | **Small** | Moderate to Major | Moderate | Moderate to Minor | Minor | Minor to Negligible |
| | **Negligible** | Moderate | Moderate to Minor | Minor | Minor to Negligible | Negligible |

# Appendix CT-B

## LVIA Walgrave

# Landscape and Visual Impact – Walgrave Village

# Report Notes

Landscape Character – Baseline

The countryside is undulating, mostly arable land, characterised by fields with hedgerows, which have frequent mature trees, mostly oak and ash. The land rises gently towards the northwest and north, with the highest points at 136m; these are some of the highest points in the local topography, with wide and extensive views. The Landscape Character Type is Clay Plateau, part of Sywell Plateau.

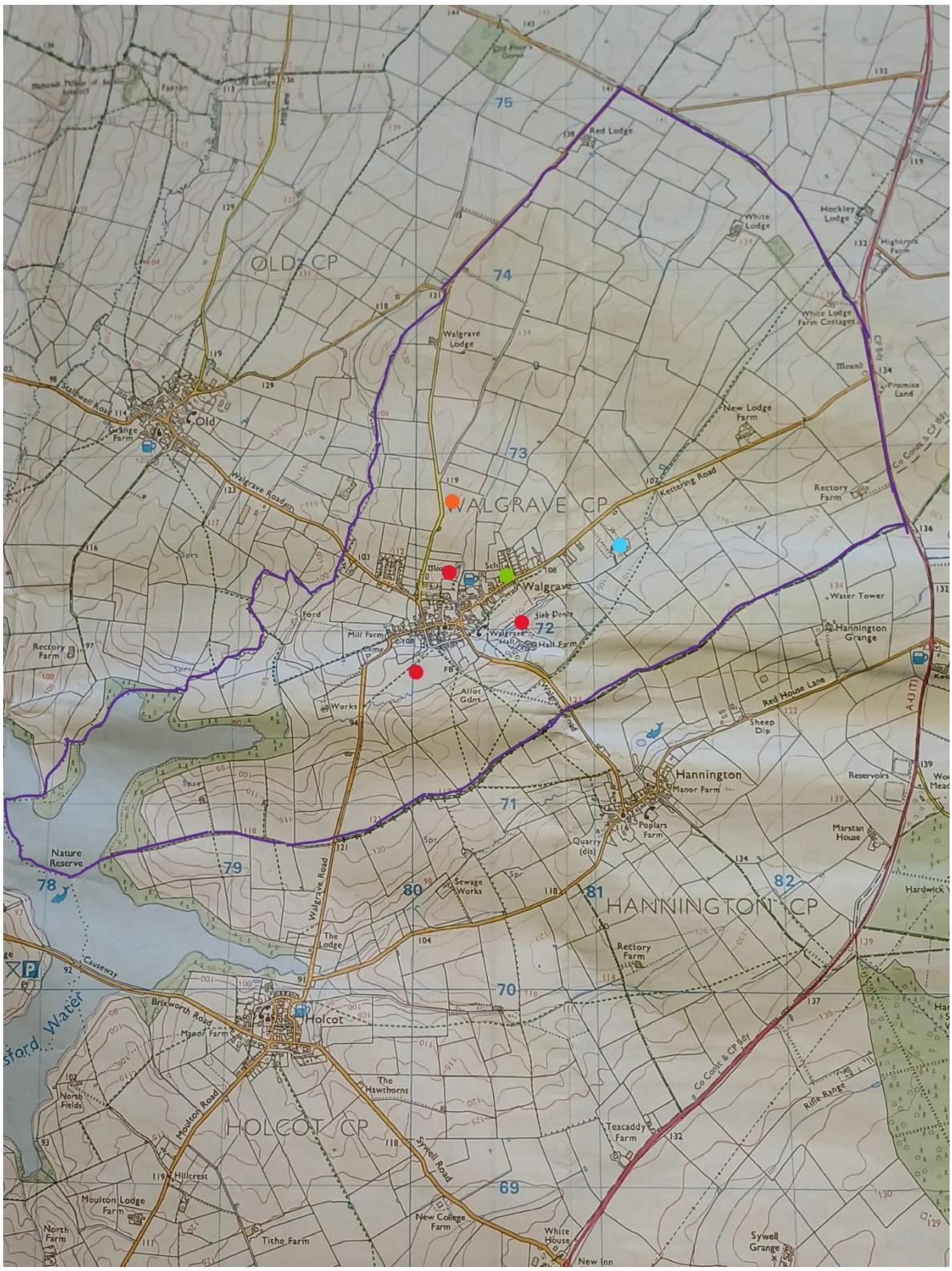
The boundaries of the parish extend to the A43, about 1.5 miles to the east, and down to part of Pitsford reservoir, which is an SSSI with particular importance for its large wildfowl populations. To the north, it is bounded by the Broughton Road from Old and the road from Broughton to Harrington which serves the new large village of Mawsley. On the southeast side, the boundary is a ridge with a byway (PRoW) along it, known as 'the Mere', running all the way down to Pitsford Reservoir in the southwest. From this byway and associated footpaths, there are open views looking over Walgrave with the church spire prominent and views down to Hannington and Holcot villages. To the west, the boundary is formed by a watercourse meandering roughly parallel to Newland Road.

There are 4 roads >4m wide emanating from the village, and one single track rural road (Newland Road) designated as a Quiet Lane. None of the roads are designated 'B' roads (contrary to information stated in the DCO).

There are 3 SSSIs within 2km of the GHS Sites A and A2 – Pitsford Reservoir (SW), Badsaddle and Withmale Park Bush Walk Woods (E) and Birch Spinney and Mawsley Marsh (N), the latter two being Ancient Woodland.

There is a Grade 1 listed church, which dates from 13$^{th}$ century, and 18 Grade 2 listed buildings.

There are 3 Scheduled Monuments within the village. These comprise: 1) Northall medieval moated manor with adjacent fishponds, 2) medieval fishponds and ridge and furrow associated with Hall Farm (part of the original Walgrave Hall, and 3) Atterbury's field with ridge and furrow, the remains of earlier village buildings and part of a hollow way.




Taken from Ordnance Survey Map 233

Purple border highlights Walgrave Parish boundary. Orange dot = Acorn Centre. Red dots = Scheduled Monuments. Light blue dot = Manvell Farm Park & Café. Light green dot = Primary School.

Watercourses drain from north and easterly directions down into Pitsford Reservoir, including one through the centre of the village and under the Lower Green. This is prone to flash flooding.

Photo taken winter 24/25 at bottom of Zion Hill, Silver Street and Northall to the east. OS Grid reference 803722.

There are approximately 350 houses and 960 residents of the village. Walgrave Primary School currently has 140 pupils, and attracts children from surrounding villages including Old, Hannington, Holcot, Broughton, Mawsley.

There is a pub, the Royal Oak, within the village, and adjacent there is the Skittles community shop selling a wide range of food and other products.

There is a Village Hall and playing fields on Newland Road, (adjacent to Northall Medieval Moated Manor Scheduled Monument), which includes a cricket green, football pitch and children's playground. These facilities are well used for a range of activities, parties, and in July, Groove on the Green is a very popular event with stalls, refreshments, and live music which usually attracts over 1000 people.

Manvell Farm Park offers a coarse fishing lake and a popular café, off the Kettering Road leading to the A43.

The Acorn Centre, an equine facility, situated on Newland Road, just before the Green Lane (a permissive path), is a therapeutic learning centre for children and young adults. There are also a number of liveries, mostly associated with Hall Farm on the Hannington Road.

There is a Pocket Park, Red Springs, on the Kettering Road at the edge of the village which has been planted with native trees, and has a stream and a pond. It is used for walking and dog-walking, and for educational purposes by Walgrave Primary School which is nearby.

Landscape character – Value

Please see separate document, entitled **Landscape and Visual Impact - Walgrave – 9 individual narratives.** This demonstrates examples of what the landscape means to some of the local residents.

Newland Road, the only single track minor rural road leading from the village, has long been in use for recreation by villagers. It is the only fairly flat route, is peaceful and offers attractive views over the agricultural fields. It commences by the Village Hall and playing fields and extends approximately 1.1 miles to reach the Broughton Road. As a result of a request by the Parish Council, it was assessed and received formal 'Quiet Lane' designation from Northamptonshire County Council in 2013.

A Quiet Lane is defined as ' a minor rural road which has been designated by local highway authorities to pay special attention to the needs of walkers, cyclists, horse-riders and other vulnerable road users, and to offer protection from speeding traffic'.


A simple survey of all households in Walgrave was conducted by a group of villagers in August 2024, when the original plans for Green Hill Solar were available, before public consultation. 95 were returned, indicating that 98% of respondents had major or some concerns about the proposed development, and were most concerned about the impact on wildlife and nature, and the scale and visual impact on the parish. 89% stated that they used the designated Quiet Lane, and the Green Lane which branches off, for recreation.

At a village open meeting in October 2024, attendees (around 80 – 100) were asked to state in what ways they used Newland Road and the Green Lane – the results were: walking = 28, dog-walking = 18, cycling = 11, jogging = 8, horse-riding = 1, bird-watching = 5, other = 3.

Landscape character – Sensitivity

Recreational users of Newland Road Quiet Lane will be very sensitive to the massive change from a quiet rural environment to an industrial landscape. NPPF for Energy Infrastructure emphasises the particular sensitivity of people enjoying recreation, to their environment.

Acorn Centre – equine-based therapeutic learning centre is almost adjacent to Site A on Newland Road. The quiet rural setting is important for the functioning of this facility.

The success of the popular fishing lake at Manvell Farm Park is dependent on peace and quiet, yet will be close to Site A2.

Landscape character – Effects

The likely effects that would arise from what is proposed would most significantly be the change from the rural setting of the village to that of an urban industrial landscape. Turning off the A43 towards Walgrave would no longer feel like leaving the busy urban/highway environment, but a continuation, with panels rearing up to the left and covering the skyline to the right. Within the village itself, although the majority of houses would not have a direct view of the Sites, some on the northern and eastern edges would not only look towards the panels but also be blighted by glint and glare for 6 months of the year (DCO documentation). Some outlying properties, most notably those at Rectory Farm on the A43, New Lodge Farm barns on the Kettering Road, and Red Lodge on the Broughton Road would be very close to many fields of large PV panels and their views blighted permanently. They would also likely be impacted by noise, significant during construction but also continuing afterwards as a humming sound.

The use of Newland Road and the Green Lane for recreation in nature would be completely undermined; it would be dominated by 4.5 metre PV panels in fields on either side. Any vegetation planted to screen such massive panels would likely take far longer than the quoted 15 years, and once grown, it would give the effect of walking through a tunnel, rather than the wide open views that have always been an attractive feature. It is understood the proposed vast array of massive panels would emit a continuous humming noise, again significantly detrimental to enjoying the Quiet Lane.

During construction, the plans include using a route through the east side of Site A from the Broughton Road, and crossing the Quiet Lane near the dip with lorries and abnormal loads. This would make recreational use of the road hazardous, with likely traffic management. The place chosen is also within a dip in the road with only short sight lines.

The entrance for all construction traffic to Site A is planned to be near a double bend on the Broughton Road, again with poor sightlines. This is a busy road at commuting times with National speed limits of 60 mph, so is potentially

dangerous, particularly when abnormal loads are being delivered. The access to Site A2 is on the Kettering Road, which again is busy during commuting times. Children are brought to Walgrave Primary school along this road from other villages, and also along the Broughton Road and Newland Road.

Construction vehicles for the cabling route will be accessing this at the bottom of a blind dip in the Kettering Road, where drivers often reach National Speed Limits; this is a hazardous and unsuitable place, which often has standing water during significant rainfall.

There is a significant potential for flooding to be exacerbated from the watercourse which runs past the medieval moated manor, down the side of Northall, along the back of Silver Street houses and under the Lower Green. This is because the watercourse runs between fields AF25/AF27 and AF26/AF28, and so in the event of heavy rain, water will drain off the panels, channel between them with less opportunity for soakaway as at present, thus delivering more water more quickly down the watercourse. The road up Northall and the bottom of Zion Hill and Silver Street have been flooded on many occasions in recent years, causing damage to vehicles and flooding of cottages. (See earlier photo).

Social and recreational amenity – Baseline and Value

Around Walgrave village, there are many footpaths, bridleways, a byway, and the Green Lane, now labelled as a permissive route, but used in long living memory as a right of way, as it led to a now dilapidated farmhouse.

Site A has no footpaths through the affected fields, but Newland Road (the Quiet Lane) runs though it, dividing it into east and west sections, and the eastern section is bisected by the Green Lane. As already noted, they are both of high amenity value to a proven substantial number of villagers who use both routes regularly for recreation. Newland Road is important as the only quieter paved route for bicycles and pushchairs, and for winter walking when the footpaths are particularly muddy.

Site A2 also has no PRoW through it, but the current owners have given verbal permission to access the fields to the residents of Rectory Farm. Another elderly villager, who lived at Rectory Farm as a child, when his grandfather was a tenant farmer, also has permission to access field A2F2 to mow the area around the old metal water mill that still stands (without it’s sails), as his parents’ ashes are scattered around it.

A bridleway runs along the southeastern side of Site A2, adjacent to field A2F4 which connects the Hannington Road with the A43 and is a continuation of the Mere. It is used by occasional walkers, but used more frequently by horse-riders as it is a convenient route from the liveries associated with Hall Farm. As it is the continuation of a ridge line, it has views particularly to the north, which will not only be obscured by the PV panels in the adjacent field, but also the skyline to the north will show the fields with panels in Site A as the land rises to a high point around the Green Lane. The horse-riders will have a more elevated view than a walker, so will be more affected at all stages of the proposed development.

The local birdlife is a very important amenity; there is Walgrave Hide within the SSSI Pitsford reservoir for observing waterfowl on the lake, which will attract visitors via the Fishing Lodge near Holcot. There is abundant birdlife in the local landscape, visible and audible on any walks on the footpaths, bridleways, byway, Newland Road and the Green Lane. Yellowhammers nest every year in the hedgerows, particularly along Newland Road. Skylarks are seen and heard over many of the fields, and in the DCO, Site A has a high population of these endangered ground-nesting birds, who need long sightlines from the air to protect their young from predators. Red Kite probably nest both in Site A and Site A2; they are schedule 1 birds whose nesting sites should not be disturbed during the breeding season from March – July.

Brown hares are frequently seen, e.g. in the fields of Site A. These mammals are always delightful to observe. There are many badger setts and other mammals less often seen.

Northamptonshire Heritage have produced a leaflet and walk of about 2 miles around the village, entitled ‘Landscapes from the Past – Medieval Walgrave’. This walk incorporates the Scheduled Ancient Monuments and gives a detailed explanation of the findings. It appears to be out of print, so please see Appendix 1 for photographs. However, it has previously brought people to the village to explore and appreciate the local environment.

The facilities and events which bring visitors to the village include:

The Royal Oak pub, which serves food and has regular themed nights and occasional musical entertainment, including an Old Tyme Music Hall.

Manvell Farm Park fishing lake and café.

Skittles community shop.

The Village hall and playing fields for parties, sports events, and the yearly Groove on the Green Comedy night and Music Festival.

St. Peter's Church – services, weddings, baptisms, funerals, concerts and other events.

Game shooting – fields to southwest of village, near Pitsford Reservoir.

Social and Recreational Amenity – Effects

The likely effects of the proposed development is that many aspects of local amenity will be significantly affected. During construction, there will be major disruption to some of the routes into the village, which could reduce business at the local facilities.

The recreational events which are most likely to be adversely affected are those which are outdoor and nature-based. Fishing at Manvell Farm Park will no longer be the quiet retreat as at present, particularly with construction so nearby on both sites. The liveries may be affected as riders may not choose to keep their horses in a disturbed and noisier environment.

The therapeutic work of the Acorn Centre is likely to be significantly affected as it will be very close to Site A and subject to noise and disturbance, particularly during construction as Newland Road is regularly blocked.

Newland Road and the Green Lane are one of the major areas for recreation for villagers. The immersion in nature, birdlife, peace and quiet and far-reaching views enjoyed will be completely disrupted for the foreseeable future, and are not replaceable, as there is no other minor single-track rural road to use. Other popular routes for walkers and dog-walkers towards the Mere and Hannington will be blighted by the views looking northeast and north, with so many fields and such acreage under continuous PV panels.

Views and Visual Amenity – Baseline

Zones of theoretical visibility – please see DCO document GH6.4.8.9.9

The assumption is based on solar panel maximum height of 4.5m, and substation height of 6.8m. (132kV substation in field AF24, Site A).

It is noted that this map, although limited to ZTV for Sites A and A2, does not have separate lines at 1, 2 and 5 km just for those sites, they are marked for the whole development. This is confusing and lacks clarity. Also, the map's definition is not adequate to enlarge it satisfactorily to show or mark with rights of way and important sites.

The ZTV of these sites is very widespread because they are at highpoints in the local topography reaching on gentle slopes to around 136m. Within the 2km radius, parts of the site are visible from most places. It is notable that the bridleway along the southeast edge of the Lamport Hall (Grade 11 listed) estate will have extensive views. Photomontage viewpoint 1 from this path in the DCO has chosen a specific point where there is a clump of higher vegetation in the foreground which has the effect of lessening the apparent impact, which is misleading.

Extensive views of the Site will also be seen from the land rising up towards Scaldwell and Brixworth, and to the far south side of Pitsford reservoir toward Pitsford village, which is >5km distant.

Further afield, as the land rises to the west on the far side of the Brampton Valley Track (disused railway line, now a Sustrans recreational route from Northampton to Market Harborough), there is high ZTV from the footpaths up towards Haselbech and Naseby, around 8km distant.

To the southwest, there is another area near Harpole with lines of sight, >10km distant.

There are even wider areas apparent which have a lower level of visibility extending to the east almost 15km, and to the south >15km.

Views and Visual Amenity – Value and Effects

It is clear from the baseline that the proposed development Sites A and A2 will have significant adverse impacts on visual amenity across a wide area. This is mostly because they are high in the local undulating topography, and the viewpoints most affected are other highpoints. By their very nature, they are where ancient routes through the landscape arose, and where historic buildings are placed, and where PRoW connect the settlements in the countryside. Thus it is the very places where we choose to admire the gentle hills and valleys of the Northamptonshire countryside that will have their views blighted by the dark grey industrial landscape. Northamptonshire's countryside is a generally a well-kept secret to outsiders, but is very much valued by it's local residents, who are keen on their outdoor activities including walking, cycling, horse-riding and fishing. We are a county with excellent major road connections, i.e. M1, M6, A14 and A1, and so it is not surprising that there is a large demand for warehousing and distribution centres. Along with this, there is a need for additional housing to house the workers and increasing population. So there have already been

significant incursions into the agricultural land in the county for these developments. The main towns, Northampton, Kettering, Corby and Wellingborough are spreading outwards and towards each other; it is vital to maintain some green space and countryside between, to prevent coalescence. Quality of life would be adversely affected if we all end up living in a continuous urban environment. The Covid pandemic helped to substantiate the mental health benefits of being able to access nature, supporting our well-being.

LCT 3.10.2025

# APPENDIX 1

Fishponds are often associated with manors or monastic sites and can be seen today at North Hall Manor and at Hall Farm. Ponds were often built close to a manor house for security, since poaching of fresh fish was common in medieval times.

Fishponds vary enormously in size and shape. They were built by engineers who were skilled in dam and sluice gate construction and who had an eye for the lie of the land and water flows. Fishponds needed a constant supply of slow moving fresh water and were often built along the bed of a stream. Dams and timber sluice gates controlled the flow of water.

Bream, pike, perch, eels, roach or tench could have been farmed here, with different species of fish kept in separate ponds, or ponds set aside for breeding.

Many of the earthwork remains on this trail are managed as part of the Countryside Stewardship scheme. The scheme aims to conserve important historic landscapes and wildlife habitats through sympathetic management.

Supported by the
COUNTRYSIDE COMMISSION

Walgrave village lies 9 miles north of Northampton, 7 miles from Kettering and 7 miles from Wellingborough.

Cars: please park in the Village Hall car park, which is signposted from the High Street.

For details of bus services from Northampton and Kettering contact: United Counties Central Enquiry Unit (01604) 20077.

The trail starts and finishes at the Village Hall car park and should take approximately 1½ hours. The trail follows public rights of way and crosses Countryside Stewardship land where there is agreement for open access. The fields can be wet and muddy. Stout, waterproof footwear is recommended.

This trail, which looks at many of the still visible traces of the medieval village of Walgrave and its surrounding landscape, has been produced by Northamptonshire Heritage.

For more information about the work of Northamptonshire Heritage please contact Kim Lanning, PO Box 287, 27 Guildhall Road, Northampton, NN1 1BD. Telephone (01604) 237272.

NORTHAMPTONSHIRE HERITAGE
Northamptonshire County Council
Planning and Transportation

# LANDSCAPES from the PAST

Medieval Walgrave

## Medieval Walgrave

*Fields, manors and fishponds*

Walgrave has been a farming community for more than a thousand years and is recorded in Domesday Book (1086). But the farming landscape you see around the village today is a relatively recent creation, dating from the Parliamentary Enclosure of 1776/7 which created consolidated holdings of land with hedged boundaries and new hedged roads.

Before enclosure, and throughout the medieval period, the land around Walgrave was divided into three huge open fields (south, middle and north fields), meadows and common land. Traces of these medieval fields and the system of farming which went with them, can still be seen today.

The open fields were divided into numerous narrow strips which were allocated to individual farmers. A farmer would expect to hold strips in each great field, some on good land, some on poor land.

The strips were ploughed by teams of oxen in a clockwise direction, so that earth fell towards the centre and built up over time. This formed the ridges of 'ridge and furrow' which we can see today. The dips or furrows between the ridges were drainage channels and marked boundaries between strips.

Important farming decisions, about which crop to sow or when to begin harvest, were made communally by the villagers.

The village lay at the centre of the three fields; it was clustered around the village greens, and at its heart stood the church of St Peter. Daily life in a medieval village revolved around the church and the lord of the manor.

*St Peter's Church*

*By Janet Minty, reproduced by permission of St Peter's Church, Walgrave*

There was a church here as early as October 1217, when the first Rector was installed. At this time the Malesoures family, lords of the manor of Walgrave, held the advowson or the right to appoint the church Rector – a right later granted to St Augustine's Priory, Daventry.

The Malesoures family held Walgrave Manor from around 1066 until 1284, when ownership passed to the de Waldegrave or Walgrave family. We do not know exactly where the medieval manor house stood, but it was probably near Walgrave Hall, now Hall Farm. The de Waldegraves held this manor until the 16th century after which it passed through several families, until it was bought by the Lane family.

*Walgrave Hall*

*Acknowledgements to Education and Libraries Department, Northamptonshire County Council*

It is thought that the Lanes were responsible for building the country house known as Walgrave Hall, which was sold to Sir John Langham for £8,630 in 1655. Gardens surrounding the hall were laid out by the Langham family around 1671–4 and earthwork remains of them still survive.

Walgrave Manor was not the only manor in the village, but it was probably the principal one. A second manor was based at Northall, the moated site near the Village Hall. You can find out more about North Hall Manor from the interpretation panel at the site. By 1657, Northall Manor had been sold to John Langham, also owner of Walgrave Manor, for £760.

One particular feature of life on a medieval manor has left its mark on Walgrave today; the village contains some excellent examples of medieval fishponds. These ponds were not garden features, but were built to breed or store fish for food. The cost of building and maintaining them was high and only the wealthy could afford them.

# Appendix CT-C

## LVIA Walgrave – 9 Narratives

# Landscape and Visual Impact - Walgrave Village

## Nine individual narratives:

The route where the pictures were taken is one of our regular walks which we have enjoyed for many years. We particularly enjoy the views included in the photos I sent as we feel they are a typical Northamptonshire mix of arable and grass fields bordered by hedges and trees . There are very few buildings apart from an occasional barn .

If the proposed solar development goes ahead, this will be permanently lost.
We greatly value the rural nature of the surrounding landscape around Walgrave which we feel improves our quality of life. The nature of the local landscape and views which we value so much will be permanently changed- bringing an industrial character to this walk. We feel that this would greatly diminish any benefit or sense of well being we currently enjoy on this route.

Photo from PRoW looking NE toward Site A2. OS Grid reference 809718

Photo from PRoW looking NE towards Site A2. OS Grid reference 812723

[redacted]
Walgrave

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We have been living in this rural area for fifty years and together with our family have enjoyed dog walking, horse riding and just walking in and around the fields and especially the "Quiet Lane" that is Newlands Road.
If this development goes ahead ,this will never be the same again as it will be extremely noisy and disruptive on wildlife when it is installed and beyond as the panels make a noise themselves. All of this will have a detrimental impact to bird nesting in particular, which in turn has to affect our enjoyment of the countryside with their wonderful song being lessened considerably.
Foxes, badgers and muntjacs reside around here and will be confused, frightened and leave the area, in order to find new habitat, which will change the environment.
Villagers won't want to walk there and a lot of social cohesion will be lost.
It is where you can walk easily and safely just enjoying the sights and sounds of the countryside.

The views to and from Walgrave will be changed for the worst for three generations. The A43 looking down into the village, across to the western horizon will be blighted by the sight of nothing but industrial shining panels, instead of green fields. How can this not spoil anyone's pleasure in living in such an advantaged area.
Farmland has it's own ecosystem and again, this will have a huge direct effect on pleasure in the countryside, which sadly won't be noticed until it has gone.

[redacted]
Walgrave

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I regularly walk my dog down Newland Road and along the Bridle Way just beyond Seeds of Change. Given that Newland Road is a Quiet Lane (and long may it remain designated as such) with limited traffic and you only see the occasional other dog walker and even less often, horserider, this walk is a perfect antidote to the hustle and bustle of 21st century living! I love watching the seasons change and checking on the wild flowers and birds in the area. I feel very strongly that such a rare and beautiful area should be protected.

I am a supporter of green energy developments but not on this scale and taking productive farmland out of use. I have watched videos of other solar farms and everything I have seen, suggests that all forms of wildlife would be very severely impacted. Additionally, the Green Hill proposals would be far more intrusive, both visually and their impact generally.

We should instead be using the vast amounts of warehousing and new housing to be found in this county. This might, at face value, be more expensive but won't be if the negative costs of welfare loss and farmland loss are also taken into account.

[redacted]
Walgrave

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I have been using Newlands Road in Walgrave regularly for the past 28 years. Living in a village we only have one decent length footpath for walking on beyond the village boundaries. Consequently, as a single track lane, Newlands Road has been the only safe route to enjoy the countryside surrounding the village. I use the lane at least 4 times a week.

As a dog walker, runner and cyclist I always meet other local people enjoying the quiet lane. Today I met, 3 horse riders, 2 dog walkers, 2 walkers and 1 cyclist, in the space of 40 minutes! The views across the fields on both sides of the lane are amazing. Location 1 has views either side of the lane. It's the perfect spot for bird watching. This morning I enjoyed watching the barn swallows swooping and over the fields catching flies.
Green Lane, (the permissive footpath )off Newlands Road, also has stunning views (this was open for many years but has been gated and labelled permissive in the last few years). Again, I have used this lane regularly for 28 years. Location 2 is my favourite view over the fields to the South West. Today the hedgerows here were a full of blackberries and sloes ready to be picked. This location is also a great spot for watching the red kites circling the farmland.
If this development goes ahead it will be disastrous for the landscape and the abundant amount of wildlife and birds it supports. The barn swallows and red kites won't be interested in flying over solar panels. It will take away their habitat. It will also completely ruin the only safe road route villagers have available to enjoy the countryside views surrounding our village. It was designed a quiet lane for exactly this reason.


Photo from Newland Road looking W over Site A field 11 (Construction entrance and track for whole site to W of Newland Road). OS Grid reference 801732.


Photo from the Green Lane looking SW over Site A field 14 (foreground) and fields AF2, AF3 in distance. OS Grid reference 804734

[redacted]
Walgrave

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If the Solar Farm was to go ahead our house and land would be surrounded by Solar Panels, on A2 this would greatly disrupt our current lovely views that we have over miles of fields. It is a source of great calm and joy to see the changing landscape as the seasons change. The colours of the grass and crops and hedgerows.

We would also greatly miss the wildlife that the solar panels would disrupt.

We see numerous deer in our garden and surrounding areas as they use the well-worn routes that they have established, it would be quite distressing and dangerous if these routes are closed and the deer end up on the busy A43.

We see partridge and their babies walking around the land as well as numerous other birds, including pheasant and woodpeckers, which will all be disrupted by the solar panels either by their breeding or by flying into the panels, injuring or killing them. We see lots of bats flying their well-used route along the hedgerows.

The peace and tranquillity of living in a natural environment cannot be over exaggerated and if the solar farm goes ahead this will be disrupted for many villagers for many years to come.

[redacted], Rectory Farm, Walgrave

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Living where we do at [redacted] is indeed a privilege and we have always regarded ourselves as custodians of the landscape while we are here. The appearance of massive solar panels as we walk our fields observing birds ( including yellowhammers  Red Kites song thrushes ) deer, foxes to name but a few will be  permanently changed as we look towards Walgrave a field away from our boundary. Our well being will be forever affected by their presence but imagine the effect on the wildlife traversing the fields that have been their domain for generations. Surely there is some common sense left in decision making that is not entirely money driven.

Private view. Photo taken from Red Lodge Farm looking S towards Site A fields 17,18,19 &20. OS Grid reference 810748

[redacted]

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I have lived in the parishes of Walgrave and Hannington for fifty two years and come from a nearby parish where my father, chairman of the county NFU, always said "live as if you might die tomorrow but farm as if you will live forever", meaning look after the fields, the land, landscape and wildlife because it is intrinsic to our life and well being. We have walked, cycled and ridden the lanes, footpaths and bridle ways in these parishes for decades always with a deep understanding of the farming, landscape and changing seasons.
Walking the bridleway CT3 from the Walgrave Hannington road towards the A43 we can see for miles towards the north of this plateau and the large area of A1 will be clearly visible. Further along, the A2 area just beside the track, over bearing high glass panels will dominate the landscape.

Photo taken from PRoW, Bridleway looking NNW over Site A2 field A2F4 toward Site A. OS Grid reference 819722.

The Newland Lane north of Walgrave (area A1) will have glass panels to both east and west of this designated Quiet Lane.
These areas will lose the rich source of the changing seasons, textures, colours, sounds and atmosphere of the farming year. New green spring growth, June bringing the scent of grass mown for hay, high summer of waving cereal crops, turning to the sounds of harvest fields and then the earthy cultivating of autumn drilling at the start of the new farming year.

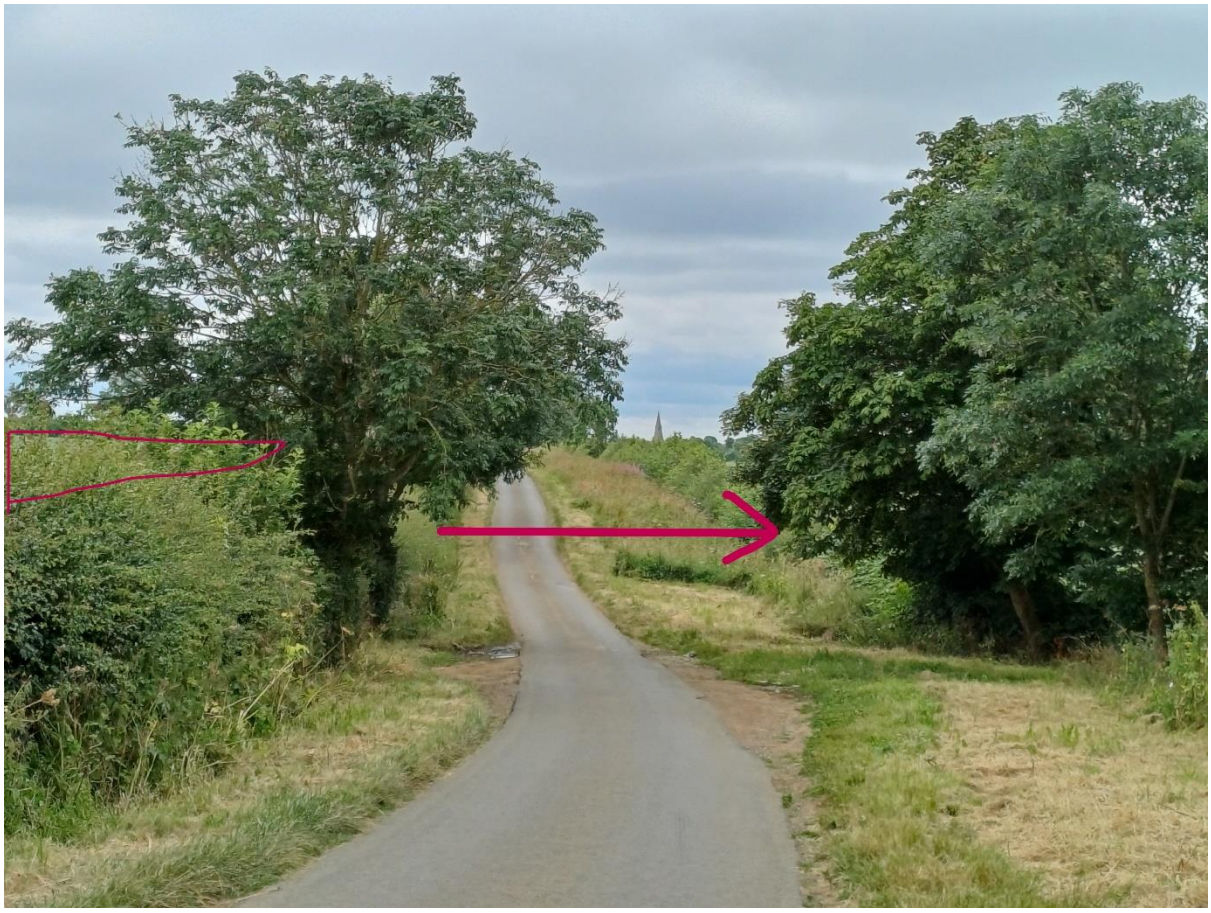

Photo taken from Newland Road looking S, with field AF29 to left and construction traffic route crossing from west to access east side. OS Grid reference 801732.

The living food producing landscape will change to sterile glass, totally alien and completely inappropriate to the countryside when the huge areas of new residential housing and giant warehouses in the county do not have solar panels fitted during construction.
Will our great grandchildren be horrified by this 3000 acres of glass in Northamptonshire fields, for sixty years, when we need food security both now and in the future.

[redacted].

Walking (and cycling) around Walgrave and seeing the views, wildlife, and being part of nature has been a very important part of my life and wellbeing, physical and mental health, particularly over the past 22 years that I have lived in Walgrave.

Driving home and seeing the village and the greenspace around starts to calm my mind. For the first 10+ years living here I walked with my husband every evening after work along the quiet lane (Newlands Lane) to the farm at the top, (inc many trips along the Green Lane when time allowed), the hedgerows and trees along the lane ever changing with seasons and alive with birds and wildlife, and the views across the fields helping to destress from the pressures of work. I still walk regularly up the Quiet Lane and see young parents pushing prams, people walking and particularly older people enjoying exercise along the designated quiet lane (few other paths/routes are accessible Whilst we are blessed with footpaths around Walgrave, few of them are accessible for people with mobility issues or for pushchairs.)and give closeness to nature as does the Quiet Lane).

On a recent trip along the Green Lane, I saw a weasel run across the gateway, the red kites were soaring above and the housemartins diving and swooping for insects in the fields which are designated to be covered in Solar Panels. A hare ran at speed across the field in the distance. Land that crops have been grown on for centuries, and part of our countryside heritage, but that will potentially be fenced in and covered with 4.5m high solar panels, and battery storage facility, this makes me feel very sad.

For the past 7 years since moving to the south side of Walgrave (and gaining a dog ) I walk every day, morning and evening across the fields and paths around Walgrave. Most mornings mainly along the paths to Hannington, on my return crossing the Mere, and the fields here a high point, across a where you are up above the village and even if you I feel a little down at the start of my walk, it never fails to inspire me and make me feel better. I often stop to look across and see the vista of fields behind the church to the left towards Old and to the right towards Kettering Road and A43. This view covers many fields that are designated as being for solar panels. The landscape will change irrevocably if the Solar Plant goes ahead . Many people walk these routes daily, many dog walkers, horse riders in the top fields, all enjoying the views across the village and natural landscape.

Most winters now the fields where my normal footpath access is, (Atterbury's Field) becomes flooded, I walk more often up the Quiet Lane and Green Lane, and value the benefits that I currently am able to enjoy.

Photo from PRoW looking N towards Site A. OS Grid reference 805716

I also walk regularly around the footpaths of Mears Ashby, (as I grew up there and have friends and family in the village, and enjoy the round walk from Mears Ashby to the reservoir,) watching the birds and nature in the fields, and I am horrified to see the extent to which the fields being proposed to be covered with solar panels there, and the impact for the village and villagers.

I fear for the wildlife, the impact of noise and wellbeing to all residents, the damage and impact of the construction phase and the removal of access to some of the most simple of life's pleasures, walking into nature, not just for myself but for all people in the village especially younger people growing up now and the generations to come.

[redacted]

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I came to live in Walgrave 32 years ago: before that I had always lived in cities and towns where there were parks, but no countryside. I have really valued living in close contact with nature, being much more aware of the changing seasons and the agricultural cycle. I have noticed the variation in birdlife, the redwings and fieldfares in the hedgerows and fields in the winter; the skylarks soaring above the fields from early spring with their evocative song. In the last 15 years, kestrels have become less obvious, whereas red kites and buzzards are seen every day.

I worked in Kettering until retirement this year, travelling by car using the Kettering Road and then the A43. At the end of a long and tiring day, as I turned right off the A43, I would see the countryside opening out in front of me each side to the horizon, with Walgrave village and the church spire nestling in a dip in the distance. This signalled the moment of transition from work and commuting, to home and nature and relaxation.

All those years ago, I quickly discovered the only single track road from the village, Newland Road, a relatively flat route, as ideal for going jogging. When my daughter was young, I would push her in her pushchair up Newland Road most days to help her have her morning sleep. When she learned to ride a bicycle, this was the obvious route to take.

For many years now I have walked regularly up Newland Road to the far end and back, or branched off on the Green Lane, for fresh air, exercise, far-reaching views and immersion in nature. In the summer months, I will see yellowhammers, swallows and martins, skylarks, wrens, woodpigeons, red kites and buzzard and many more. During the pandemic, walking the footpaths became a way of coping with the strange circumstances and isolation, as seeing nature continue as always was very calming.

Being a regular walker now in all directions from the village, I am used to the wide-ranging views and tranquillity, the village nestling lower in the landscape, and routes from the village radiating out to higher ridges via gently undulating slopes.

If this development goes ahead, covering a quarter of the land area within the parish boundary with PV panels on the higher areas in the topography, almost every view will be blighted by the industrial landscape, and the tranquil countryside setting ruined. Turning off the A43 towards the village will be like entering a dystopian landscape, with vast panels rearing up immediately to the left, and covering the skyline all along to the right. No longer a moment of relaxation, but a stressor to one’s piece of mind. During the Covid pandemic, it became so apparent that being in nature was beneficial to mental health and well-being.

The following 3 pictures show the changing views as one walks along the Green Lane heading approximately north. This route has been used in long living memory as a right of way, and was only enclosed with a gate around 25 – 30 years ago after travellers moved in. The signs indicating a permissive path were only added in the last year or two, once this scheme was being developed. It is clearly shown on a 1951 OS map as a track, equivalent to others leading to farms e.g. to Rectory Farm in Old that are acknowledged rights of way.

As is the case with all the photos in this document, they have been taken in late summer, after harvest, and before the hedgerows have been trimmed in the autumn. The views in all areas are much greater in the winter months because of loss of leaves from hawthorn, blackthorn and other hedgerow shrubs. Photos taken from the Kettering Road from the A43 driving down toward the village are not able to demonstrate the continual changing views from one side to another and give a realistic impression of the potential impact if this development proceeds.

Photo taken from the Green Lane looking ENE over Site A field AF28. OS Grid ref. 802731

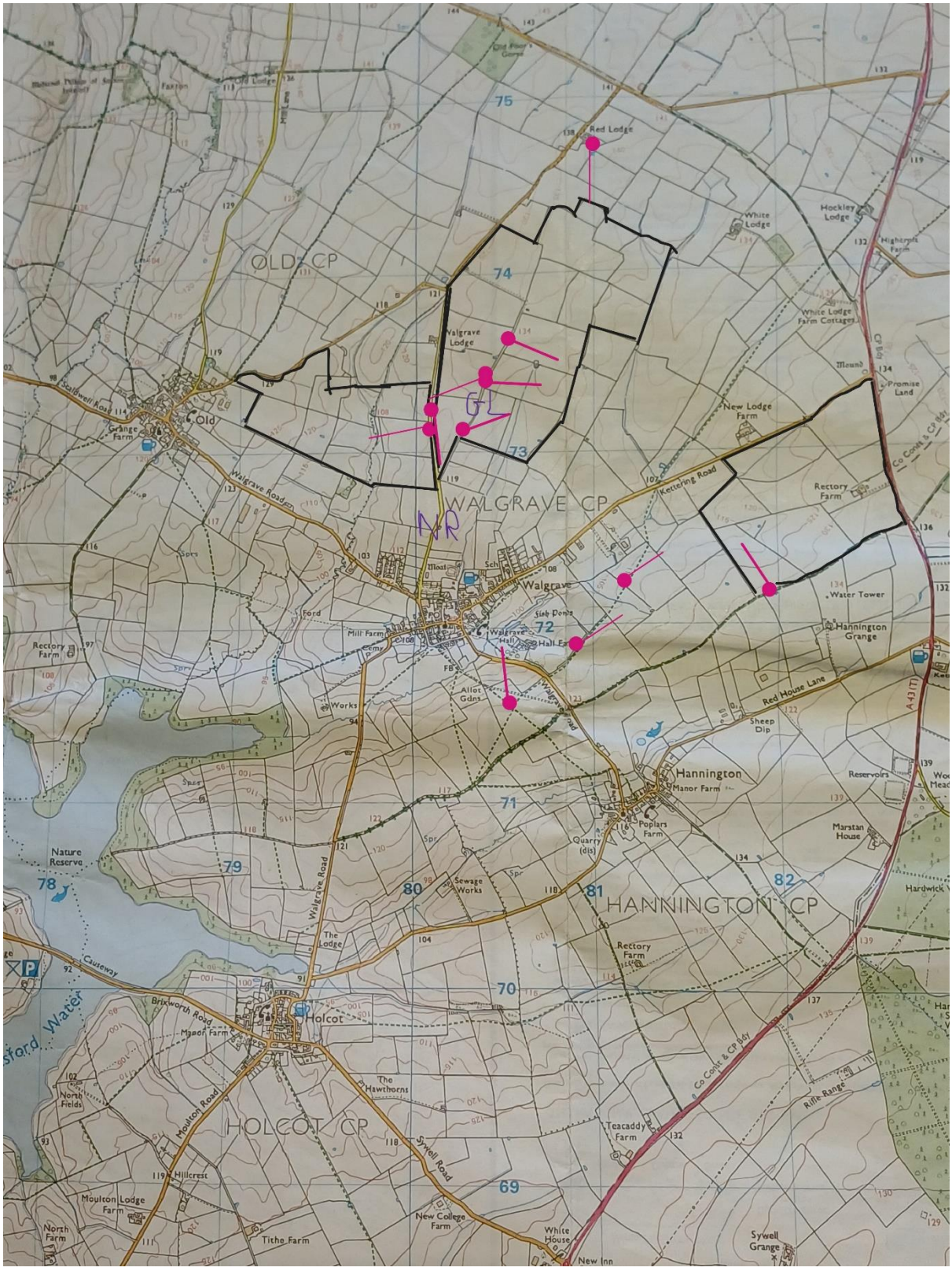
Photo taken from the Green Lane looking E over Site A field AF26 towards Site A2. OS Grid ref. 804734. This photo shows the view from the same point in the Green Lane as Photo 2 in [redacted] narrative, and marks the start of the row of 11 mature oak trees along the Green Lane as in next photo.

Photo taken from the Green Lane looking SE over field AF24 towards Site A2. OS Grid ref. 805736

[redacted]

LCT 29.09.2025

Please see map overleaf.




OS Map 1:25.000 showing Walgrave village, Sites A and A2 outlined in black, and photo points as in narratives in pink, with lines showing direction of view.

NR = Newland Road, GL = Green Lane

# Appendix CT-D

## BESS Risks

D1.1 Usually, lithium-ion solar batteries are used for BESSs, being a rechargeable energy surplus power storage solution (lithium-ion batteries are commonly used in rechargeable electronic devices such as mobile phones, and in electric vehicles (EVs)). Lithium is toxic, as are the other metals they contain, such as cobalt, nickel, and manganese; the most toxic and dangerous component is the organic electrolyte.

D1.2 Lithium-ion batteries can be **extremely dangerous**. Sometimes they short-circuit, resulting in fire. They are also prone to 'thermal runaway', which means that if the internal circuitry is compromised, an increase in internal temperature can occur. At a certain temperature, the battery cells begin to vent hot gasses, in turn increasing the temperature in neighbouring cells. Ultimately, this will lead to ignition, and fire. Even a relatively small incident can lead to an uncontrollable fire. As such, large quantities of batteries pose a significant safety risk, which is why lithium batteries are considered hazardous materials / dangerous goods, and must be handled, stored and transported accordingly (for transportation purposes, the UN categorises all lithium batteries as Class 9 — miscellaneous dangerous substances and articles).

D1.3 It is now well-known[1] that **lithium-ion battery incidents which occur at scale can be catastrophic**, resulting in the combustion of nearby structures, explosion, and the release of highly toxic clouds / plumes containing gases such as hydrogen fluoride (HF) and highly inflammable gases including hydrogen (H2), methane (CH4), ethylene (C2H4) and carbon monoxide (CO). There are also particulates in the plume resulting from the metallic oxides in the battery: these are probably the most damaging to health and the environment.

D1.4 These events may in turn cause further explosions or fires upon ignition. The chemical energy then released can be up to twenty times the stored electrochemical energy.

D1.5 In fact, BESS thermal runaway events are not 'fires' in the traditional sense of the word, but self-sustaining chemical reactions that have gone out of control. They pose a unique threat to firefighters: because the fires are chemically-driven, requiring no external oxygen, they cannot be extinguished by traditional methods. Vast amounts of water are needed (and need to be readily available) over many days due to the risk of reignition.

D1.6 The water used to extinguish a fire and / or to flood / cool both the affected and adjacent BESS units inevitably becomes contaminated with toxic chemicals (such as highly corrosive acids, PFAs[2] and toxic metallic oxides), which would almost certainly drain directly and / or indirectly into surrounding areas / watercourses, and leach through soils.

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[1] See for example *Safety of Grid Scale Lithium-ion Battery Energy Storage Systems* (5th June 2021) by EurIng Dr Edmund Fordham MA PhD CPhys CEng FInstP, Fellow of the Institute of Physics; Dr Wade Allison MA DPhil Professor of Physics, Fellow of Keble College, Oxford University; and Professor Sir David Melville CBE FInstP Professor of Physics, former Vice-Chancellor, University of Kent. Note that numerous thermal-runaway events have occurred since the report was published.

[2] Perfluoroalkyl and Polyfluoroalkyl Substances

D1.7 Such incidents are highly likely to cause **widespread major damage to health, life, property and the environment.**

D1.8 Adverse effects on landscape character and visual amenity would occur due to damage to / loss of vegetation.

D1.9 Very importantly, the proposed BESS site lies adjacent to the River Nene, the floodplain of which is characterised by extensive gravel pits. The river and floodplain perform **multiple critical functions** including ecological, this section of the river (Upper Nene Valley Gravel Pits) being designated as a Ramsar site, Special Protection Area (SPA), and Site of Special Scientific Interest (SSSI). Evidently, the effects of a thermal runaway event could be **catastrophic and extensive**.

D1.10 Also importantly, the Fire and Rescue Services (FRSs) require two separate points of access to a BESS site in case one is blocked by smoke, flood etc. In this case, it is not clear whether this has, or could, be provided.

# Appendix CT-E

# Effects on Water and Soils

## Introduction

E1.1 Soil and water quality and health are directly relevant to 'landscape': adverse effects on soils and water are very likely to give rise to adverse effects on landscape character, visual amenity, and biodiversity.

E1.2 Soil and water quality / health are also an important ecological consideration, and ecological effects are relevant to 'landscape', as different habitats have different characteristics and features which contribute to a landscape's character; loss or erosion of habitats can therefore lead to adverse effects on landscape character and visual amenity. Changes to landscape features, elements and landcover can also result in changes to these habitats and the species of flora and fauna they support (see for example 1st bullet point at GLVIA3 para. 3.22). Thus, landscape and ecological consultants should always work in close collaboration.

E1.3 The cause, nature, and implications of some of the potential ecological effects that could arise are explained in the main report and other appendices, as referenced below.

E1.4 The evidence is clear that **significant damage can be caused to water and soil quality during the construction, operation, and decommissioning of solar / BESS developments**, for example through soil compaction, disturbance and turbation (the mixing of soils / sediments) and increased runoff and pollution. Some of the damage to soils is likely to be irreversible – or at least, may take decades to recover from.

E1.5 The European Union's September 2020 report called *Potential impacts of solar, geothermal and ocean energy on habitats and species protected under the birds and habitats directives* states that '***Habitats transformed into solar farms will suffer from a wide range of impacts*** *such as reduced vegetative cover, compaction of soil, reduced infiltration, increased runoff, decreased soil activity, decreased soil organic matter, and impaired water quality (New Jersey Department of Environmental Protection, 2017)*' (my emphasis).

## Flood Risk / Drainage

E1.6 In some cases, **parts of the sites are within Flood Zones 2 and 3**. Often the flooding is localised, contained within narrow valleys where small watercourses rise / cross the sites, for example Sites A1 and A2, and the northern part of Site E – all these watercourses drain southwards into the River Nene. Also, the southern part of Site G, but here, the watercourse drains into the River Great Ouse. However, the **whole of the western part of the proposed BESS site**, alongside the River Nene, is within Flood Zones 2 and 3 – see Appendix CT-D which explains about the potential for significant adverse environmental effects arising from thermal runaway events, especially on the Nene's designated habitats (SAC, SPA, and SSSI).

E1.7 Where vulnerable infrastructure and solar arrays are located within flood zones, they have to be raised above the future flood levels predicted by the Environment Agency (which account for climate changes) for the epoch when a proposed development would be operational – in this

case, if consented, probably the early 2090s. Consequently, the scheme elements are more visible and exacerbate already-high levels of adverse visual effects. Also, extensive engineering works including cut-and-fill are likely to be required, and significant amounts of suitable fill material may have to be transported to the site (and of course, removed at decommissioning).

E1.8 It is known that at some of the sites, mole and / or land drains exist, installed to alleviate drainage problems. Construction works, especially the piling required for each solar panel leg, would almost certainly damage / sever the drains. Combined with soil compaction (see below), this would exacerbate surface water flooding.

## Water and Soil Pollution

E1.9 There is always a risk of pollution incidents happening during all types of construction, interim, and decommissioning works. Such incidents may be localised and / or widespread, temporary and / or permanent.

E1.10 Regarding 'interim' works, LVIA para. 8.5.2 3rd bullet states that '*Solar PV Panels typically have a lifespan of up to 40 years or more, and it has been assumed that Solar PV Panels will be replaced* ***once*** *during the lifetime of the Scheme. The Solar PV Panels are anticipated to be replaced* ***over a 24 month period****. The BESS could be replaced* ***up to five times*** *during the operational phase*' (my emphases).

E1.11 Note that whilst the above assumes that panels 'typically' last 40 years, according to the National Grid's website, '*the average solar panel lifetime [is] around 25-30 years*', and many other sources state 20 years. Therefore, as a **worst-case scenario** – which is what must be assumed – major interim works could be required **twice** in the project's 60-year lifetime. Also, panels can malfunction, and can be damaged by eg hailstones, and people throwing / birds dropping stones at / on them, requiring regular replacement. Other scheme equipment / elements need replacing from time to time.

E1.12 It is important that all the possible constraints, impacts, risks and requirements are identified and understood at an early stage (**prior** to determination) and robust measures are designed and implemented to avoid such incidents happening in the first place, and / or to reduce high levels of adverse effects.

E1.13 In this case, the Application includes BESS. As explained in Appendix CT-D, if a thermal runaway event occurs, the water used to extinguish a fire and / or to flood / cool both the affected and adjacent units inevitably becomes contaminated with toxic chemicals which may drain directly and / or indirectly into surrounding areas / watercourses, and leach through soils.

E1.14 Also, toxic smoke would not only cause damage to human health, it would also lead to contamination of soils (and associated farmland, crops and livestock) and watercourses / bodies (including drinking water supplies).

E1.15 A report produced by ADAS for the Welsh Government published in March 2023 called *The impact of solar photovoltaic (PV) sites on agricultural soils and land quality* (doc ref SGHS/Ag.3) states that during construction, pollution incidents can result in longer-term detriment to soils.

E1.16 During operation, potential pollutants include products used for washing panels, and herbicides / insecticides – see also sheep-grazing in Appendix CT-H.

E1.17 Solar panel construction involves the use of a product called Ethylene Vinyl Acetate (EVA). This is a petroleum-based polymer which forms protective layers between the panels' glass face, the inner cell strings, and the back-sheet. EVA also serves as a primary barrier against water ingress and internal leakage. In theory, when properly laminated and cured during the vacuum lamination process, EVA encapsulates the cell string in a watertight matrix. Together with the glass on the front and the polymer back-sheet on the rear, this helps reduce the risks of

environmental attack. However, EVA's protective powers depend heavily on manufacturing quality and environmental conditions: over time, it can degrade due to UV exposure, thermal stress, and oxidation, leading to a range of failure modes including delamination and / or cracking. When this occurs, EVA no longer provides a reliable seal, allowing moisture to infiltrate and / or toxic / corrosive internal materials or residues to leach out, including acetic acid.

E1.18 In terms of the effects of this and other forms of pollution on both water and soils, in a letter from the local Wildlife Trust (doc ref SGHS/Ec.2), the authors explain the devastating adverse effects which arose during and / or soon after the construction of a solar development within the Gwent Levels SSSI, especially on soil and water quality. Teams had carried out post-construction monitoring, and the letter summarises the results. For example:

a) *Levels of several waterborne pollutants arising from the constructed solar farm have risen hugely since construction. For example,* [regarding] *levels of suspended solids (silt) inside the development site… the levels of this damaging pollutant produced by the solar farm were over 14 times higher than pre-construction*.

b) *Very high levels of total petroleum hydrocarbons TPHCWG (a very damaging pollutant adversely affecting the aquatic invertebrate and plant citation interest of the SSSI) were recorded inside the solar farm site, at 230 µg / litre, compared with a pre-construction level on the site of less than 10 µg / litre*.

c) *Even these very high levels of pollutants caused by the solar farm may be underestimates, because other pollutants, for example Nitrite as N and Nitrite as N02, were recorded at very much higher levels postconstruction compared with pre-construction*.

E1.19 The letter goes on to say that '*The flora on the site has been severely damaged by the construction process and there is no evidence of any attempts to mitigate against this... It should be stressed that this is merely a snapshot of the damage caused to the SSSI, and that further damage is likely to manifest itself as the years go by*'.

E1.20 See also Appendix CT-K, which is an extract from the Trust's website with a recent update on the situation.

E1.21 The effects of the proposed development on water quality are relevant to this Scheme (especially due to the presence of the River Nene). Runoff from the site during construction, interim works, and decommissioning could give rise to **adverse short- and long-term effects on flora and fauna** due to problems such as silting and potentially polluting / toxic substances. The substances can also leach through soils and enter watercourses / waterbodies.

## Effects on Soils

E1.22 At para. 6.4, the Applicant's Farming Report (APP-571) states that '*Only in the areas where there is removal of soil, to create bases for the tracks and inverters, is there the potential for agricultural land quality to be affected. These areas are limited to 21.2 ha of land*'.

E1.23 I **disagree** that *the potential for agricultural land quality to be affected* is limited to these areas (which are set out in the Farming Report's Table 4: Area Disturbed by ALC Grade), for the reasons set out above, below, and in Appendix CT-G.

E1.24 I have watched videos taken during the construction of large-scale solar plants such as the Cleve Hill Solar Park NSIP [EN010085], some of which can be found on YouTube, and which show **extensive activity and soil disturbance throughout the sites**.

E1.25 The Institute of Environmental Management and Assessment (IEMA)'s guide *A New Perspective on Land and Soil in Environmental Impact Assessment* (February 2022) defines soil impacts as '*permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading)…*' (Table 3, page 49). It also notes that this can include '*effects*

*from temporary developments*', which it explains '*can result in a **permanent** impact if resulting disturbance or land use change causes permanent damage to soils*' (my emphasis). The Farming Report refers to the same points.

E1.26 Most importantly, the cause and nature of many of the effects arising from the construction (and operation) of solar / BASS are not properly understood are only just becoming evident, due to this being a relatively new industry in the UK – at least, at this scale – and there being relatively few large sites where construction is underway or complete. Regarding decommissioning effects, few if any solar plants in the UK have been fully decommissioned, so very little is known about what the effects would actually be.

E1.27 To date, very little independent monitoring of effects during and / or post-construction has taken place (the Gwent Levels site mentioned above is an exception); also, it is likely to be many years before certain effects are experienced / realised.

E1.28 The ADAS / Welsh Government soils report confirms that '*There have been few studies of solar PV sites which have a focus on the impacts on agricultural land and soils. This is largely because solar PV sites are recent developments but also because in the early years sites were located on brownfield land or poorer quality agricultural land. The importance of achieving successful restoration of solar PV sites has increased in significance as the number, size and operational time frame of solar PV sites on BMV agricultural land has increased*'.

E1.29 In one of its responses (March 2023) to a proposed solar development (Mallard Pass NSIP EN010127), Natural England (NE) explained that regarding solar development generally, '*there could be a **disbenefit to the soil resource due to unknowns** as a result of the solar development infrastructure. It is currently **unclear as to what impact the solar panels may have on the soil properties such as carbon storage, structure and biodiversity**. For example, as a result of changes in shading; temperature changes; preferential flow pathways; micro-climate; and vegetation growth caused by the panels. Therefore, **it is unknown what the overall impact of a temporary solar development will have on soil health***' (my emphases).

E1.30 In 2021, having considered an application for a small (22MW) solar development in Pembrokeshire (Blackberry Lane ref DNS/3245065), at para. 39, the Welsh Minister for Climate Change's decision letter (doc ref SGHS/Ag.6) concluded as follows (with my emphases):

'*the structure of agricultural soil is fragile and easily damaged and… **the construction of a development of the scale proposed is likely to result in a substantial amount of ground disturbance across the application site**. This disturbance would arise from the engineering operations necessary to construct a solar park of the scale proposed and from the potential for widespread soil compaction caused by the movement and use of heavy vehicles and machinery required for the installation of the supporting posts and the excavation of trenches, access paths and foundations across the site. In my view the impact of these operations and the nature of the vehicles and equipment required are **not comparable to agricultural practices and are likely to significantly damage the structure of the soil and result in the loss of BMV agricultural land. (IR164-165)***'. Regarding loss of BMV land, see Appendix CT-G.

<u>Soil compaction / disturbance / turbation</u>

E1.31 One of the main causes of soil damage / degradation is compaction, which farmers and land managers know all too well can significantly reduce soil health / quality, and therefore try to avoid, or mitigate.

E1.32 As the ADAS / Welsh Government report explains, '*The impact of soil compaction is well documented (Batey, 2009) and crop growth, yield and quality may be adversely affected. There are also wider environmental implications relating to water and air quality*'.

E1.33 The report goes on to explain that '*the main cause of compaction is the compressive forces applied to the soil from the wheels or tracks of machinery. Hakansson (1985) found that an axle load of 10 tonnes increased soil bulk density to a depth of 50 cm. Compaction may be very persistent in the subsoil and* ***possibly permanent*** *(Hakansson et al 1988). Where there is 'industrial compaction' the depth of compaction can extend to* ***depths of 1m*** *(Spoor, 2006) and* ***may persist for up to 30 years*** *(Batey, 2009)*' (my emphases).

E1.34 During decommissioning of solar developments specifically, the report explains (with my emphasis) that '*Access roads and tracks may require reinforcing to be of a standard suitable for heavy machinery. Trafficking will again occur across the site on and off the site tracks as panels, frames and inverter cabins and substations are removed… which can result in soil compaction… **The extraction of the piles is likely to be more problematical than the initial installation**…*'.

E1.35 Natural England (and other organisations) recommend that in order to minimise the potential detrimental effects of construction activities on the soil resource, it should be ensured that a grass sward is fully established (ie no bare ground), prior to the installation of the panels and associated infrastructure.

E1.36 Unfortunately:

i) The presence of a grass / other thick sward on the soil surface does not protect against compaction, although it can help to protect against the adverse effects of superficial soil disturbance and turbation (and runoff – see above).

ii) If the sward being established was the proposed operational species-rich meadow mixture, it would not establish successfully on arable soil – see Appendix CT-F.

iii) Even if a temporary grass ley was established prior to construction, it would take at least two growing seasons to develop a sward dense enough to withstand at least some of the construction damage, which would no doubt result in unacceptable delays in the project programme.

iv) Even if a temporary grass ley was established, and the soil fertility problems were resolved, once the panels and other infrastructure were in place it would be impractical, and perhaps impossible, to replace the ley with a species-rich mixture, as this would involve removal and resowing, or over-sowing, or plug-planting, either mechanically, or by hand, over a very large area, most of which would be covered by panels.

E1.37 Furthermore, it is difficult to remedy damage such as compaction using normal agricultural equipment, as the panels, once installed, prevent ease of cultivation, such that compaction and structural damage can remain until panels are removed, at which point further damage including compaction occurs. Compaction can cause long-term drainage issues that affect both soil quality and the ability of the soil to absorb water, leading to increased run-off and localised flooding.

E1.38 The nature of the soil is also an important factor in the way in which it will be affected during construction / other works, and by changes in use.

E1.39 According to APP-057 ES Chapter 20 Agricultural Circumstances para. 20.6.6, '*Deep clay… soil dominates the majority area of all the Sites*'.

E1.40 Evidently, carrying out extensive and invasive construction / interim / decommissioning activities on high-quality / fertility arable land which is characterised by such soils – where working conditions may be adverse, especially in the areas which are prone to flooding / ponding – is very likely to give rise to **high and long-term levels of adverse effects on soil structure and microbiology**.

E1.41 In addition, due to compaction and disruption of existing drainage patterns / systems, some parts of the site are likely to be wet for the duration of the operation, leading to anaerobic soil conditions which reduces soil health and quality (however defined – see Appendix CT-F).

E1.42 Furthermore, it is inevitable that during construction, existing land / mole drains would have been destroyed /damaged / severed, and therefore new drainage systems would need to be installed either during or post decommissioning.

E1.43 It is also important to note that normally, the underground cables would remain in situ, and it would be up to the landowner to decide whether to remove them (the cables would have residual value, but removal can be difficult, damaging, and costly).

E1.44 Generally, on heavier, less freely-draining soils such as these it is more difficult to avoid compaction, but turbation is a problem on most soil types.

E1.45 Turbation can occur during many construction activities, such as tracking and turning of vehicles; and engineering works / excavations for access tracks, structures, foundations, attenuation / infiltration basins, and trenches for cables and drains which are backfilled with foreign material – all of which would be required in this case.

Soil erosion

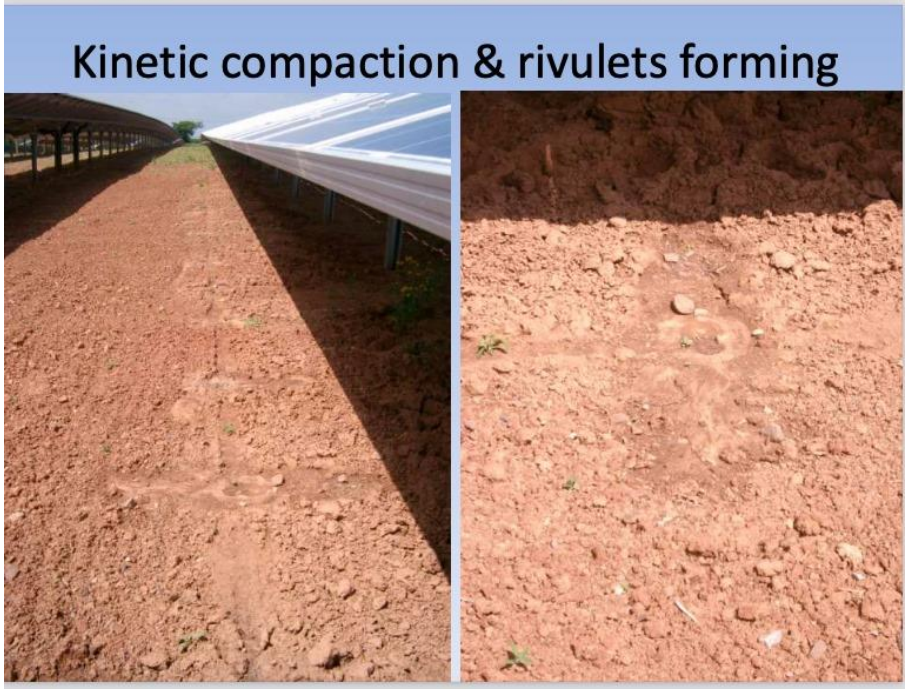
E1.46 During construction (and decommissioning) works, bare soil can quickly erode due to surface water runoff and potentially be lost, ending up where it is not wanted, for example in other fields, watercourses, and on roads. The risks can and should be anticipated, and robust prevention / mitigation measures put in place to ensure that the soil is preserved.

E1.47 During operation, there would be runoff from the solar panels – not just from rain, but from panel washing, and potentially, from water used in BESS thermal runaway / other emergency events. As explained above, the effects of runoff depend greatly upon the nature of the landcover under and in between the arrays: if a good, dense sward exists when the panels are erected, and it remains in place, then soil erosion is less likely than if the soil was bare.

E1.48 Section 2.2.4 of the ADAS / Welsh Government report explains (and illustrates, at Figure 6) that '*There is likely to be some instances of run-off from the solar panels, which could result in the compaction of soils at the base of the panels (Choi et al, 2020). Over time rivulets can form along the trailing edge of the panel with potential risk of soil erosion creating rills and gullies across the site. The sand bed could act as a drain, especially on heavy textured soils, leading to drainage discharges or wet patches at the down slope end of each trench*'.

E1.49 At the Gwent Levels solar site mentioned previously, the monitors found that '***The ground appears compacted*** *and the panels have large areas of bare earth under and around them, with brambles starting to take over the area*' (my emphasis).

E1.50 Also, see the photos overleaf (evidence from appeal ref APP/D3315/A/13/2203242), which show how rain falling off the lower edges of the panels onto bare soil forms rivulets and increases runoff.


Kinetic compaction & rivulets forming

# Appendix CT-F

# Land Restoration, Soil Quality and Fertility

**Reversibility / Permanence**

F1.1 In 2015, an appeal decision letter (DL) was issued relating to a proposed solar development (APP/M2270/A/14/2226557) which would have had a lifespan of twenty-five years. The appeal was recovered for the Secretary of State (SoS)'s determination. The SoS agreed with the Inspector's analysis and conclusions, and with his recommendation.

F1.2 Para. 24 of the DL states that the SoS '***disagrees… that the temporary nature of the proposal is relevant*** *insofar as the effects of the scheme, both positive and negative, would endure for a limited period. The Secretary of State takes the view that* ***25 years is a considerable period of time*** *and* ***the reversibility of the proposal is not a matter he has taken into account*** *in his consideration of whether the scheme should go ahead*' (my emphases).

F1.3 Similarly, a 2016 solar appeal (APP/B9506/W/15/3006387) relating to a scheme with a lifespan of thirty years was recovered for the SoS's determination.

F1.4 Para. 18 of the DL states, '*The Secretary of State takes the view that* ***30 years is a considerable period of time*** *and* ***the reversibility of the proposal is not a matter to which he has given any weight****. He considers that* ***a period of 30 years would not be perceived by those who frequent the area as being temporary*** *and* ***that the harmful effect on the landscape would prevail for far too long***' (my emphases).

F1.5 Many experts now agree that applications for solar power stations *should* be assessed as 'permanent', as that represents the worst-case scenario. As mentioned during Green Hill ISH1, the Mallard Pass solar NSIP [EN010127] assessments assumed 'permanence'. The ES stated that '*The operational life of the Proposed Development is not proposed to be specified in the DCO and* ***the Applicant is not seeking a time limited consent****. The EIA has been carried out on the basis that the Proposed Development is* ***permanent****, to ensure a* ***worst-case assessment*** *of likely significant effects*' (my emphases).

F1.6 It was concluded that in terms of the Mallard Pass DCO, a time-limited consent was necessary; however, **that does not preclude assessments being based on the worst-case scenario of permanence**.

F1.7 Furthermore, and very importantly, recent planning decisions for non-NSIP schemes show that LPAs are now granting decades-long extensions for first-wave solar plants due to commercial pressures and technological advances which are increasing the lifespans of solar panels and other infrastructure elements. In other words, **the lifespan of a solar generating plant / BESS cannot be constrained by planning conditions**, and in future, multiply-extended operational periods could become the norm.

F1.8 Evidently, in these scenarios, **adverse effects would be experienced for even longer than was originally assumed**.

## Restoration

F1.9 In APP-081 Appendix 8.3: LVIA Assessment Sheets, in the Landscape Fabric section (PDF pp. 626 - 662), the following statement applies to **all** the sites: '*At decommissioning, agricultural fields would be returned to agriculture with all structural landscape mitigation retained*'. However, as noted in the main report, the LVIA's results are based on the assumption that **all** structural landscape mitigation would be retained.

F1.10 This is contradicted in APP-041 ES Chapter 4: Scheme Description, which states that '*Post-decommissioning, the landowners would choose how the land is to be used and managed, the landowner **may** return the land to arable use, although it is **likely** that established habitats such as hedgerows and woodland would be retained*' (my emphases).

F1.11 The uncertainty means the LVIA's predictions cannot be relied upon.

F1.12 In APP-571, which is the Applicant's Farming Report, para. 5.17 states that '*The objective is to remove panels and restore all fixed infrastructure areas to **return the land to the same ALC grade and condition as it was when the construction phase commenced***' (my emphasis).

F1.13 In my opinion and experience, it is **highly unlikely** that the land **could** be returned to the same ALC grade and condition, for reasons which are explained below. Whether the land **would** be returned to the same ALC grade and condition is also considered below.

F1.14 Note that the proposed DNO substations, high-security fencing, gated access, and cables, would **remain post-decommissioning**.

F1.15 Also note that in 2021, having considered an application for a small (22MW) solar development in Pembrokeshire (Blackberry Lane ref DNS/3245065), at para. 41, the Welsh Minister for Climate Change's decision letter (doc ref SGHS/Ag.6) concluded as follows (with my emphases):

'*With regard to restoration, the Inspector is mindful of the guidance contained in TAN 6 which advises **restoring land to BMV quality is seldom practicable**. In this case, despite the evidence presented about the rigorous approach which would be taken to the decommissioning of the site, **the Inspector does not consider, given the nature and scale of the disturbance, the land can be effectively restored to BMV quality and that it would be lost for future arable food production**. (IR167-169).*'

F1.16 Regarding loss of BMV land, see Appendix CT-G.

F1.17 Appendix CT-E explains how construction / interim / decommissioning works can result in long-term / permanent adverse effects on soils (and drainage – the two are closely interrelated).

F1.18 Here, extensive and intrusive engineering works with significant cut-and-fill / possible retention measures would be required to construct the extensive platforms and attenuation basins / swales.

F1.19 The removal of these and other structures / materials would involve another round of significant engineering works and associated soil damage, exacerbated by the earth-moving necessary to restore the land to its previous natural profile. Large amounts of redundant material would need to be exported and new subsoil / topsoil imported for infilling and creating a new surface to receive arable crops (where previously grown). It is likely that the subsoils beneath platforms would be **permanently compacted**.

F1.20 Even if the land beyond the platforms in the array areas **had** recovered from damage during construction, interim works such as panel replacement would have resulted in further / ongoing damage / compaction, and removal of the access roads, piles, cables and other elements would exacerbate this. Subsequent restoration would cause damage to soils and adversely affect soil quality / fertility (if indeed it was fertile after 60 years which is extremely unlikely – see below) across the entire site. Adverse effects on drainage and water quality would also occur.

## ‘Resting’ soils

F1.21 At paras. 7.8 (iii) and (iv) the Farming Report cites planning decisions where the appellants’ arguments that ‘resting’ arable soils for long periods of time is beneficial for soil health and quality. However, whilst relying upon these statements to illustrate a point bout scheme benefits, **the Farming Report does not provide any evidence to support these claims**.

F1.22 Whilst there are likely to be certain biodiversity benefits when arable land is ‘switched’ from arable to meadow, there are also disbenefits and adverse ecological effects associated with solar and BESS developments, some of which are described in other appendices and / or the main report. Also, the following section explains the significant problems associated with the Applicant’s proposal to establish species-rich grassland swards.

F1.23 Regarding ‘allowing the soil to rest’, I **fundamentally disagree** that resting arable soil improves soil health and quality, **if** the future farming use is proposed to be reversion to current arable use, as is the case here.

F1.24 The concept of soil recovery, or ‘resting’, has been practised for millennia: in summary, it involves cessation of intensive / depletory agricultural activities for a period of time, and either allowing plants to establish naturally, or sowing / planting a cover crop such as a grass ley or legumes, which helps the soil replenish its depleted resources. Importantly, it **specifically relates to cultivated / ‘improved’ land which would be re-cultivated / improved again following the ‘resting’ period**, as opposed to ‘restoring’ land to a pre-cultivated / pre-improved state (also ‘rewilding’).

F1.25 In principle, **the long-term ecological benefits of restoration are far greater than those of resting**. The benefits of resting are only **temporary**, and do not increase exponentially: recent studies show that the optimum resting period is around three – five years[3]. Resting arable / improved soils for **long** periods (eg 40 years, as is the case here) is **not** beneficial for soil fertility. Long-term resting results in a **decline** in fertility – which is why **permanently** restoring / replacing arable / improved land with meadow / pasture is beneficial for many reasons not least carbon sequestration and soil health in terms of microbiology etc. which is compromised by intensive farming.

F1.26 Where the future intention is to change **temporary** meadow / pasture back to arable land, as here, the more time that goes by, **the more difficult the reversion from low-fertility to high-fertility becomes**.

F1.27 In fact, it has been demonstrated that the most effective method of improving and maintaining good soil health (physical, chemical, and biological) for food production is through regular and diverse crop rotation interspersed with resting, as opposed to semi-permanent leys and / or grazing.

F1.28 Perhaps the problem partly lies in the erroneous assumption that ‘soil health’ and ‘soil quality’ are one and the same, whereas the terms ‘soil quality / health’ are interpreted differently by eg ecologists and farmers.

F1.29 Even if the land **could** be returned to its former condition and use, then whether it **would** be, and whether the proposed landscape and ecological mitigation and enhancement measures would remain (if they still existed) are matters which it is almost impossible to guarantee due to the uncertainties.

F1.30 Firstly, even if planning conditions were able to be imposed, in 60+ years they may not be enforceable, nor relevant. The effects of climate and weather pattern changes are likely to result

[3] See for example https://www.low-impact-farming.info/sites/default/files/2020-05/rotations-and-their-impact-on-soil-health-2019-ffc-merfield.pdf. Also, Natural England has published advice on the subject – see Technical Information Notes (TINs) 066 and 067 (doc refs SGHS/Ag.4 and Ag.5).

in changes in national and local priorities, and to landuse and farming practices (the Applicant recognises this).

F1.31 Secondly, the landowner / manager may not **want** to keep surviving landscape features which had been introduced for mitigation purposes, or even enhancement, as they may not be compatible with continued agricultural use – also as recognised by the Applicant.

F1.32 Indeed, even if the proposed meadow / pasture **is** considered to be enhancement and not mitigation, if the land was to revert to former use ie arable, then **the meadow / pasture would have to be removed**. Note that currently, this would have to be screened under the EIA (Agriculture) Regulations.

F1.33 Below is an extract from an article published in December 2024 called *Solar Farms and Biodiversity Net Gain – a reality check*[4] (with my emphases):

'*Removing solar panels and associated infrastructure as part of the decommissioning phase of a Solar Farm is understandable. However, if the land on which it sits was intensively farmed or subjected to imposed sterility prior to installation of the panels, then* ***returning the land to its former agricultural state at the end of the lease would mean the intentional destruction of any nature restoration (or Biodiversity Net Gain if you prefer) achieved in the intervening decades***.

'*Looking at the bigger picture, and beyond the 30-year timespan that applies to BNG, from a cynical perspective it would mean that restoration of the natural world on that particular plot of land would have been a waste of time were that to happen. More to the point,* ***it would render meaningless in the grand scheme of things any BNG aspirations and promises made at the outset that influenced granting of planning permission for the project***'.

## Establishment of species-rich wildflower grassland / meadow / pasture

F1.34 There are **significant problems** associated with the Applicant's proposal to establish species-rich wildflower grassland / meadow / pasture which the Applicant has not considered, and which could potentially affect the BNG calculations.

F1.35 Firstly, most species-rich meadows are open fields where there is little or no shade. Where there is shade, the species composition is completely different, often far less diverse / biodiverse, and 'rank'. It is now recognised that due to heavy shading under the panels, **species-rich meadows will not establish successfully in solar array areas** – nowadays, applications for solar plants (for example Mallard Pass NSIP [EN010127] tend to propose standard / shade-tolerant grass ley species-poor seed mixtures in the array areas (which are also easier to maintain), with species-rich meadows / other habitats (which require more complex, intensive, and sensitive management), created elsewhere.

F1.36 Secondly, a large proportion of the sites where solar and BESS are proposed are Best and Most Versatile (BMV) agricultural land (see Appendix CT-G), comprising Grades 1, 2 and 3a; most of the rest of the land is Grade 3b which is below the BMV threshold but still highly-productive farmland. Such land is characterised by **high fertility** / nutrient-rich soils. However, in order to establish successfully, wildflower meadows and species-rich grassland require **low fertility** / nutrient-poor soils.

F1.37 The Applicant does not explain how this would be achieved. Would the topsoil be stripped and stored, or sold? Even if the fertile topsoil was removed, it would take many years for a good, species-rich sward to develop, and that assumes a great deal of careful, regular maintenance and management.

[4] https://nplsecondnature.com/2024/12/12/solar-farms-and-biodiversity-net-gain-a-reality-check/

F1.38 NE's Technical Information Note (TIN) 066 *Arable reversion to species-rich grassland: site selection and choice of methods* (doc ref SGHS/Ag.4) explains that '*Where land has been in arable cultivation for many years reversion can be followed by a period of low productivity known as the lean years. This is caused by a shortage of nitrogen and it may be many years before nitrogen builds up and the sward is as productive as permanent semi-natural grassland*'. Some experts say it can take **over 20 years**. In the meantime, the sward is likely to become dominated by invasive 'weed' species.

F1.39 Furthermore, successful establishment of species-rich wildflower meadow does not occur under / around solar arrays not only due to shading, but also runoff, and form of use / management (as grazing by sheep is impractical – see Appendix CT-H) – herbicides are customarily used).

F1.40 Finally, the Applicant states that the land would be returned to returned to the same ALC grade and condition, but does not explain how this would be achieved either. Would the stripped topsoil be returned, or would new topsoil be imported? Have the effects of this been considered? How would these proposals be secured, and monitored / enforced?

F1.41 **The above matters need to be clarified / rectified**.

# Appendix CT-G

## Loss of BMV Land

G1.1 The proposed development would result in **significant loss of Best and Most Versatile (BMV) agricultural land**.

G1.2 A large proportion of the sites where solar and BESS are proposed are BMV land, comprising Grades 1, 2 and 3a; most of the rest of the land is Grade 3b, which is below the BMV threshold but still highly-productive farmland.

G1.3 National planning policy is clear that where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of higher quality.

G1.4 Written Ministerial Statement (WMS) dated the 15th of May 2024 is of relevance. This sets out further detail on how balancing the competing priorities for energy security and food production is intended to be applied. It indicates that '*due weight needs to be given to the proposed use of Best and Most Versatile land when considering whether planning consent should be granted for solar developments*', and that '*as the land grade increases,* ***there is a greater onus on developers to show that the use of higher quality land is necessary***' (my emphasis).

G1.5 NPS EN-1 states that proposals should seek to **minimise impacts on BMV land** and **preferably use land of Grade 3b and below**, and that **proposals should not be sited on BMV land without justification**.

G1.6 EN-3 para. 2.10.29 states that '*While land type should not be a predominating factor in determining the suitability of the site location applicants should, where possible, utilise suitable previously developed land, brownfield land, contaminated land and industrial land. Where the proposed use of any agricultural land has been shown to be necessary, poorer quality land should be preferred to higher quality land avoiding the use of "Best and Most Versatile" agricultural land where possible. 'Best and Most Versatile agricultural land is defined as land in grades 1, 2 and 3a of the Agricultural Land Classification*'.

G1.7 The ADAS report mentioned in Appendix CT-E (the ADAS report itself is doc ref SGHS/Ag.3) states that construction works '*can negatively impact the flexibility of agricultural land,* ***potentially lowering quality and ALC grade***' (my emphasis).

G1.8 Also mentioned in Appendix CT-E is that in one of its responses (March 2023) to a proposed solar development (Mallard Pass NSIP EN010127), Natural England (NE) explained that regarding solar development generally, '*there could be a* ***disbenefit to the soil resource due to unknowns*** *as a result of the solar development infrastructure. It is currently* ***unclear as to what impact the solar panels may have on the soil properties such as carbon storage, structure and biodiversity***. *For example, as a result of changes in shading; temperature changes; preferential flow pathways; micro-climate; and vegetation growth caused by the panels. Therefore,* ***it is unknown what the overall impact of a temporary solar development will have on soil health***' (my emphases).

G1.9 In this case, in my opinion, the Applicant has **not** demonstrated that the development of BMV land is necessary.

G1.10 At para. 6.4, the Applicant's Farming Report (APP-571) states that '*Only in the areas where there is removal of soil, to create bases for the tracks and inverters, is there the potential for agricultural land quality to be affected. These areas are limited to 21.2 ha of land*'.

G1.11 I **disagree** that *the potential for agricultural land quality to be affected* is limited to these areas (as set out in the Farming Report's Table 4: Area Disturbed by ALC Grade), for the reasons set out in Appendices CT-E and CT-F.

G1.12 Farming Report para. 6.5 states that '*the areas* [in Table 4] *are all capable of restoration to comparable grade at the decommissioning phase. Their "loss", therefore, is temporary and for the duration of the operational phase only. It is not a permanent loss*'.

G1.13 I **disagree** that the areas *are all capable of restoration to comparable grade at the decommissioning phase*, also for the reasons set out in Appendices CT-E and CT-F.

G1.14 In 2021, having considered an application for a small (22MW) solar development in Pembrokeshire (Blackberry Lane ref DNS/3245065), at paras. 40 - 42, the Welsh Minister for Climate Change's decision letter (doc ref SGHS/Ag.6) concluded as follows (with my emphases):

'*… The Inspector is of the view the use of the site for complementary agricultural uses, such as* ***the grazing of livestock, does not compensate for the loss of BMV agricultural land even for a temporary period****. (IR166)*

'*With regard to restoration, the Inspector is mindful of the guidance contained in TAN 6 which advises* ***restoring land to BMV quality is seldom practicable****. In this case, despite the evidence presented about the rigorous approach which would be taken to the decommissioning of the site,* ***the Inspector does not consider, given the nature and scale of the disturbance, the land can be effectively restored to BMV quality and that it would be lost for future arable food production****. (IR167-169).*

'*Overall, the Inspector considers for the aforementioned reasons, the proposed development would be likely to result in the loss of BMV agricultural land and, in doing so, have an* ***impact on the objective of ensuring future food security***.'

# Appendix CT-H

## Sheep-grazing

H1.1 Whilst not forming part of this Application, in APP-041 ES Chapter 4: Scheme Description, at para. 4.6.42 the Applicant states that '*should consent be granted, grazing sheep will be explored*'.

H1.2 Para. 4.6.45 is more optimistic about the prospect, stating: '*The solar panel installation will allow a sheep herd to be developed, which means agricultural output from the land can continue*'.

H1.3 The LVIA / its appendices do not mention sheep-grazing as an option. It is alluded to briefly in APP-046 ES Chapter 9: Ecology and Biodiversity, and considered as an alternative to mechanical management in APP-548 Outline Landscape and Ecological Environmental Management Plan (OLEMP).

H1.4 In APP-057 ES Chapter 20: Agricultural Circumstances Table 20.1: Summary of Consultation and Responses, the Applicant responds to Irchester, Mears Ashby and Hardingstone Parish Councils' consultation comments expressing concerns about the use of prime agricultural land for energy generation and implications for UK food security. The Applicant states (with my emphasis), '***the land is not being entirely removed from farming****, as sheep grazing may still take place on most of the Sites, allowing it to continue contributing to food production. Furthermore, soil health is expected to improve over the Scheme's 60-year lifespan as the land transitions away from intensive arable farming*' (the latter point about 'improved soil health' is dealt with in Appendices CT-E and CT-F).

H1.5 In APP-571, which is the Applicant's Farming Report, para. 8.6 says that '*The effect of the Proposed Development will be a reduction in farmed area of about 15%, but* ***with the potential for sheep grazing to offset reduced arable areas***' (my emphasis).

H1.6 Para. 9.32 says, '***The land will likely, in any event, continue to be used for food production through sheep grazing and rearing****, in parallel with the generation of renewable energy. Therefore* ***the impact on food production is offset by sheep grazing****, producing lamb and wool, and requiring agricultural labour*' (my emphases).

H1.7 Para. 7.4 states that '*The land will be in grassland, and it is* ***expected*** *to be managed by grazing of sheep or mechanically. This is* ***common practice, and entirely feasible***' (my emphases).

H1.8 I **agree** that mechanical management of grassland in solar array areas is common practice, and feasible up to a point (mechanical management of grassland underneath panels can be problematic); however, I do **not** agree that **sheep-grazing** *is common practice, and entirely feasible*.

H1.9 I have undertaken a great deal of research on the subject.

H1.10 One solar applicant cited an appeal (I do not have the reference) where the Secretary of State's decision letter said, '*there is nothing to demonstrate that sheep grazing would be unlikely to occur, and this approach formed part of the proposal in line with national guidance*'. However, so far, my research indicates that this is an **unfounded assumption**.

H1.11 Most solar developers' / promoters' publicity material shows photographs of sheep grazing on solar sites. Interestingly, the vast majority are stock images which are available online, and many are from the same sites, some of which are overseas (and feature goats). In fact, there appear to be **very few solar developments in the UK where *currently*, sheep are being grazed**. The reasons why this may be the case are explained below, but in summary, to date, the evidence indicates that in reality, grazing sheep within solar developments is neither feasible, practical nor viable, and is even **unwise**.

H1.12 In a Westminster Hall debate held in June 2022, James Gray MP said, "*No shepherd worth his salt would graze his sheep on a solar farm. The grass is low quality. I do not think there is one single solar farm in the west of England currently being grazed, and the notion that they could be is nonsensical*".

H1.13 I am aware of two sites in England where, in the last couple of years at least, sheep were being grazed, but I do not know if that is still the case. One is a small (c. 12ha) site off Pillmore Lane east of the M5 near Burnham-on-Sea, the other is mentioned below.

H1.14 Given the Applicant's claim that agricultural use could continue alongside energy generation, **it would be very helpful if the Applicant could produce a note for the ExA listing examples and providing details of operational solar sites in the UK where currently, sheep / other animals are regularly grazed**.

H1.15 The author of the Applicant's Farming Report may recall that at the end of a solar appeal hearing last year, during which it had been suggested that sheep-grazing at solar sites is common practice in the UK (and poultry-keeping was mentioned), I asked if he would be kind enough to send me examples of solar sites where sheep-grazing is practiced, and he agreed; however, although we corresponded about the matter, I did not receive the information.

H1.16 Also last year, during the Byers Gill solar NSIP [EN010139], the ExA asked the applicant to provide examples '*of Solar Farms* [the Applicant] *is aware of where sheep or other animals graze*'.

H1.17 This was subsequently provided. However, a) one site was not yet operational; and b) having looked closely on Google Earth, sheep could only be seen in one field of one of the solar array sites on the list (Newlands Farm, Axminster, Devon EX13 5RX). Importantly, **it was evident that the flock had access to an adjacent open field of pasture** (currently this can still be seen on Google Earth).

H1.18 Of course the images may have been taken at times when sheep had been taken indoors.

H1.19 Two of the sites were apparently being used for keeping poultry: no hens or geese were visible on Google Earth, but they might not be so easy to spot.

H1.20 Also, in my opinion, it is very unlikely that solar array areas are suitable for poultry-keeping.

H1.21 Firstly, where deer-proof fencing is proposed around the array areas, as is the case here, it is necessary to create gaps in the fence at ground-level (or install small, purpose made gates) to allow the continued passage of medium-sized mammals such as badger and hare across the site. Evidently, this would also allow poultry predators such as fox and mink to enter the compounds. Birds could be locked up at night, but finding them, rounding them up, and getting them all into the coops would be very time-consuming.

H1.22 Secondly, large numbers of free-ranging poultry can cause significant adverse effects, primarily due to the large volume of nutrient-rich manure produced (chicken manure is high in phosphates and nitrates), as well as the detrimental impact of the birds using the land.

H1.23 Thirdly, it is known that poultry (and other birds) perch on top of solar panels and excrete, requiring the panels to be cleaned more frequently than usual.

H1.24 After the above examples of sites where animal-keeping was said to be practiced had been scrutinised and doubts raised about whether grazing was actually being practiced, the Applicant was asked to provide **evidence** for the sites currently being used for long-term sheep- / other animal-grazing purposes; however, by the time the Examination closed, the Applicant had not responded to the request.

H1.25 Regarding sheep-grazing on solar sites in practice, shepherds I have spoken to told me that not only is it extremely difficult, but also 'cruel' to keep sheep in solar array areas. That is mainly because sheep need to be kept in open fields where shepherds can easily observe and monitor the flock. Daily inspections are critical for good animal husbandry, so that animals which are injured / lame / ill can be isolated from the herd and treated quickly.

H1.26 Sheep are particularly prone to getting cast and dying if not righted within hours – according to one shepherd, they "*wake up each morning trying to find a way to die*". However, within the confines of solar array areas, all but near-distance views are completely blocked – see photo below – so it is very difficult for shepherds and sheepdogs to find their way around, and the use of quad bikes is "*virtually impossible*".

*Eye-level view within solar array in UK (sourced online, photographer / location unknown)*

H1.27 Shepherds also know that due to shading from the panels, a healthy grass sward does not develop; thus, the grass does not provide the necessary amount of sugar and other nutrition that sheep require for fattening-up. A poor sward can also adversely affect sheep's health.

H1.28 A 2016 study[5] at the operational Westmill solar site in the UK found that '*panels reduce temperatures beneath them in summer by up to 5.2°C, and the ground under them is also dryer. It also found that both species diversity and biomass were lower under panels, attributed to differences in micro-climate and vegetation management. Under the panels there were significantly fewer species, dominated by grasses, with only one broadleaved flowering plant present, being yarrow (Achillea millefolium), which is both shade-and drought-tolerant*'.

[5] A. Armstrong, N. J. Ostle, and J. Whitaker (2016) *Solar park microclimate and vegetation management effects on grassland carbon cycling*. Environ. Res. Lett. 11 074016

H1.29 At the Gwent Levels solar site (doc ref SGHS/Ec.2), monitors noted that '*The ground appears compacted and the panels have large areas of bare earth under and around them, with brambles starting to take over the area*'.

*Grassland management at solar site in UK (sourced online, photographer / location unknown)*

*Weeds, left unmanaged, could become a problem for the panels*

H1.30 Many solar site operators simply use herbicides (and fertilisers), even though as here, the ecological assessments in particular have assumed that sheep would be grazed or the sward would be cut for hay, and therefore, damaging chemicals would not be used (although they may not have been aware of the use of environmentally-toxic chemicals on sheep, such as endectocides[6]).

H1.31 Another problem is that sheep-grazing does not appear to be financially viable. One shepherd said, "*Why go to all these additional costs to get an extra £50 per acre sheep-grazing rent when you are renting the land to the solar company for £1,000 per acre?!*".

H1.32 Also, I was advised that at one solar site, "*a large array had to be completely recabled after sheep were given access and chewed through the wires*".

H1.33 In summary, in my opinion, it is not at all safe to assume that during operation, land would be grazed by sheep (or animals kept), nor that despite the change of land use from agricultural to industrial, there would be the benefit of continued agricultural use. In fact, it is **highly unlikely that agricultural use could or would continue during operation**.

[6] Endectocides are drugs often administered to sheep, which are effective against both endoparasites and ectoparasites, but they are environmentally toxic. Ivermectin, for example, has become notorious because of lethal and sublethal effects on beneficial coprophagic *Coleoptera* (eg dung beetles) and other invertebrates, disrupting biodiversity and ecosystem services. See eg https://bit.ly/iverimpact.

H1.34 However, should the Applicant disagree, then as mentioned above, it would be very helpful if a note could be produced listing examples and providing details of operational solar sites in the UK where currently, sheep are regularly grazed / other animals being kept.

H1.35 Also, although I was not present when discussions about sheep-grazing were held during ISH1, I know from the transcript that the author of the Applicant's Farming Report (Mr Kernon) referred to recent statistics which apparently state that **50%** of operational solar developments are grazed by sheep.

H1.36 It would be very helpful if the ExA would consider **asking the Applicant for more information about these statistics**. For example, who commissioned / carried out the research / studies, how were the figures derived, what were the criteria / the basis for their application, what evidence was collected, and so on.

# Appendix CT-I

## Glint and Glare

I

**Overview of glint and glare**

I1.1 Glint is a momentary flash caused when sunlight hits a smooth surface such as water and glass, or a solar panel. Glare is diffused light caused by the reflection of the sky on such surfaces; it is less intense than glint, but the effect may be experienced continuously for long periods throughout the day.

I1.2 The following images show examples of 1) and 2) glint, and 3) glare, arising from solar panels.

*1) Glint*

*2) Glint from Wheal Jane solar site, Cornwall (imagery © Google 2024)*

*3) Glare*

I1.3 According to a study called *Understanding Emerging Impacts and Requirements Related to Utility-Scale Solar Development* (September 2016) by Argonne National Laboratory[7], the glint and glare arising from solar panels is '*of **unusual intensity and unique appearance***' (my emphasis).

I1.4 Both phenomena are known to at best distract, and at worst, cause brief loss of vision – also known as flash-blindness – in motorists, train drivers, and pilots, which can cause serious road, rail and air accidents.

I1.5 Both are unpleasant / cause visual discomfort when viewed from relatively long distances, and are highly disturbing / disorientating when experienced at close quarters, especially regularly / for long periods of time. The effects can negatively affect the quality of people's lives, and their well-being. Furthermore, in close proximity, there is the potential for ocular damage.

I1.6 According to the *Understanding Emerging Impacts and Requirements Related to Utility-Scale Solar Development* study, '*the health and safety impacts of glare from solar facilities have been documented extensively*', and cites several references. On page 18, the study explains that '***Ocular damage from glare viewed at very short distances is possible***' (my emphasis), although it goes on to say that this is '*primarily a concern for workers because public access to facilities is controlled*'. However, in this case, **PRoWs cross many of the sites**, and there are PRoWs, lanes, residential and other properties, on the boundary of, and close to, the sites.

## Glint and Glare Assessment guidance and method

I1.7 Currently, in the UK there is no published formal guidance for carrying out Glint and Glare Assessments (GGAs). The company which appears to carry out the majority of GGAs for UK solar applications is called Pager Power, and they have written and published their own informal guidance.

I1.8 The GGA for this proposal was not carried out by Pager Power, but it is based on their guidance (the current 4th edition, published in 2022[8]).

I1.9 Comments on the informal guidance and GGA method used for this project are explained further below where relevant, but in summary, GGAs assess effects on a) safety, and b) residential visual amenity.

I1.10 Regarding **safety**, GGAs assess the effects of glint and glare on human receptors who, if affected by the phenomena, could potentially cause a major accident resulting in large numbers of casualties, namely pilots and people in air traffic control towers; train drivers; and people driving vehicles along '*major national, national, and regional roads*'. They may **consider** effects on the safety of people using minor roads and PRoWs, but always scope them out of the study at an early stage due to them being categorised as Low sensitivity receptors (which is what the Applicant's GGA has done).

I1.11 Regarding **amenity**, whilst GGAs assess effects on **residential** visual amenity, they do not assess glint and glare effects on **public** visual (or social / recreational) amenity, ie people travelling along local lanes PRoWs.

## Glint and glare effects

I1.12 In summary, the Applicant's GGA (APP-052 ES Chapter 15) concludes that in terms of the effects of glint and glare arising from the proposed solar arrays, **all** of the aviation, road, and residential receptors identified would experience **Minor Adverse** effects (not significant).

[7] https://publications.anl.gov/anlpubs/2016/10/130700.pdf

[8] www.pagerpower.com/wp-content/uploads/2022/09/Solar-Photovoltaic-Glint-and-Glare-Guidance-Fourth-Edition.pdf

I1.13 However, my review identified matters and receptors not considered in the GGA, and concluded that there is the potential for glint and glare to result in **significant** adverse effects.

I1.14 Note that Minor Adverse is the level of **residual** effect: in certain cases, without the proposed mitigation measures, levels of effects would be higher. GGA para. 15.7.3 explains that to reduce high levels of glint and glare effects on ground-based residential receptors, mitigation in the form of '*mature vegetation as instant screening*' is proposed.

I1.15 This measure is described in the GGA technical appendices (APP-157 ES Appendix 15.3 Green Hill C D and E Ground-Based Receptor Results), and shown on APP-207 - 219 Figures 4.10 to 4.20 Landscape and Ecological Management Plans. It is briefly mentioned but not explained nor described in the Outline Landscape and Ecological Management Plan (OLEMP) (APP-548), and not mentioned nor accounted for in the LVIA.

I1.16 According to LVIA para. 8.4.91, '*The LVIA has considered the conclusions of the Glint and Glare Assessment… in association with an assessment of the magnitude of Landscape and Visual impacts using the methodology prescribed above*'. However, that is one of the very few references to glint and glare in the LVIA / APP-078 Appendix 8.1 LVIA Methodology, and there is **no further discussion nor analysis of the effects** (potentially, the 'instant screening' vegetation could result in levels of adverse visual effects between Years 1 and 15 being **lower** than predicted in the LVIA).

I1.17 It is possible that the LVIA did not consider glint and glare effects to be a highly relevant factor because the GGA had concluded that the highest level of effect on all visual receptors would be **Minor Adverse**.

I1.18 It is important to note that the GGA is based on the LVIA's analysis of existing screening vegetation and recommendations for additional screen planting, both of which, in my opinion, are flawed (see main report). Thus, in this respect, the GGA is also flawed, and therefore, for many visual receptors, **levels of adverse effects would be higher than predicted**.

I1.19 For example, the GGA erroneously assumes that existing / proposed vegetation would **fully screen** views all year round, whereas a) most views would only be filtered in winter; b) elevated views would not be screened; and c) some existing tree belts relied on to fully screen are very thin / gappy.

I1.20 Also, the GGA erroneously assumes (as does the LVIA) that views would be screened by vegetation for the duration of the 60+-year operation, which cannot be guaranteed and is highly unlikely, as explained in Section 4.4 of the main report.

I1.21 In addition, the informal guidance does not appear to state whether elevation and angle of view should be considered in the assessments, despite it being a highly relevant factor. North Somerset Council's revised Solar Voltaic Arrays Supplementary Planning Document (SPD) states that '*Particular consideration should be given to the glint and glare impact on properties that are higher up a slope than the solar development, as the angles involved mean that these are **most likely to experience any glint and glare effects created***' (my emphasis).

I1.22 Another important point to note is that the informal GGA guidance stipulates set study area boundaries (eg 1km for major roads and residential dwellings) that apply to all GGAs. I find this arbitrary, one-size-fits-all approach surprising: in effects assessments for other topics, the study area boundary is set at the distance at which significant effects could potentially be experienced, which of course varies depending on a wide variety of factors, including the size and scale of the development. I have spoken to experts who carry out GGAs in other countries who set the study area boundary according to size / scale amongst other criteria, with utility-scale solar plant effects on ground-based human receptors considered **up to 5km from the site boundary**.

Aviation, ecological and heritage receptors

I1.23 Regarding aviation receptors, I note the assessment originally concluded that glint and glare would give rise to significant adverse effects on aviation receptors at William Pitt Airstrip and Sywell Aerodrome, but that an Aviation Specialist was appointed who '*confirmed that, based on their extensive real-world experience of the effects of solar panels on aviation receptors, the modelled results would not result in a significant impact on the aviation receptors in practice*' (GGA report para. 15.9.2).

I1.24 However, aerodrome safeguarding is a legal requirement for an airport under both ICAO (International Civil Aviation Organisation) regulations and UK CAA (Civil Aviation Authority) regulations. Where certain developments are proposed up to 13km from airfields (see below), as is the case here (Sywell Aerodrome is **adjacent** to Site C, c. 1km from Site D, and c. 1.5km from Site D), the risks to both aviation and ground-based receptors from **birdstrike** may have to be considered. Applicants may be required to produce a Bird Hazard Management Plan (BHMP) (also referred to as a Birdstrike Management Plan (BSMP), or a Wildlife Hazard Management Plan (WHMP)).

I1.25 The CAA explains (on its website) that '*Birdstrikes are a cause of damage to aircraft and have the potential to cause an accident. The risk of a birdstrike can however be minimised through the application of appropriate and effective bird control measures adopted by aerodrome operators, working in conjunction with other organisations and specialists*'.

I1.26 In the UK, the CAA is advised and supported by the Combined Aerodrome Safeguarding Team (CAST). CAST produces Aerodrome Safeguarding Advice (ASA) Notes which deal with such matters – see for example April 2024 *ASA Note 3: Wildlife Hazards Around Aerodromes*, and February 2024 *ASA Note 5*: *Renewable Energy Developments* (doc refs SGHS/O.2 and SGHS/O.3).

I1.27 According to Note 3, '*The internationally accepted safeguarding area with reference to bird hazards is defined by ICAO as a 13km radius around the aerodrome reference point (ARP)*'; however, in some cases, some birds fly at distances of over 45 kilometres each way to exploit food waste which may increase the birdstrike risk at an aerodrome, so '*Where doubt arises, planning applications outside the 13km radius should always be forwarded to the aerodrome for comment*'.

I1.28 Incidentally, Advice Note 5 states that '*In addition to glint and glare, there are other considerations such as engine failure after take-off (EFATO), physical safeguarding, effects to rescue and firefighting services and wildlife. The potential Electromagnetic Interference (EMI) effects upon CNS (Communication, Navigation & Surveillance) may also be a consideration*'. I do not know if the Applicant has considered these matters.

I1.29 Nor do I know whether a BHMP or similar has been requested for this proposal by operators, nor whether it is necessary, and **clarification of this would be helpful**. If it is required, some of the Applicant's assessments may need to be revised.

I1.30 For example, opportunities for certain bird species birds to feed, breed, nest, roost, perch, and / or hide would have to be avoided / restricted. Recommended mitigation measures include bird-scaring systems eg cannons, and regularly cutting back berrying hedges which attract birds.

I1.31 Evidently, such measures can adversely affect a) landscape character; b) visual amenity (and result in less, or different visual screening of the development than assumed); amenity; and ecology (and potentially, BNG calculations).

I1.32 Whilst it may not be within the scope of GGAs to consider glint and glare effects on wildlife or the settings of heritage assets, the findings should still be cross-referenced with and factored into the ecological and heritage assessments.

I1.33 In this case, GGA Table 15.1 Relevant Scoping Opinion Comments PINS ID 3.10.4 explains that 'As per 3.10.4 if the Scoping Opinion, the Planning Inspectorate considers that given the current rural nature of the surrounding area, the ES should assess other receptors such as… ecological receptors'. The Applicant's comment says, '*It is noted that there is no evidence in Glint and Glare guidance or wider literature to suggest that there are ecological impacts of glint and glare as such, ecological receptors have not been included within the modelling assessment*', and refers to Section 15.4 of the GGA report.

I1.34 GGA para. 15.4.13 explains that '*In the absence of U.K. government guidance on the assessment of impact from glint and glare on ecological receptors, the literature review published by BSG Ecology (Ref 15.18) was referred to. The literature review concluded that impacts from glint and glare on ecological receptors are unlikely. As such, ecological receptors have not been included within the modelling assessment*'.

I1.35 I **disagree** that *impacts from glint and glare on ecological receptors are unlikely*.

I1.36 It is important to note that the BSG Ecology report was completed in 2019. Since then, more solar developments have become operational, more ecological monitoring has been undertaken, and more research has been carried out, with relevant new literature available. This suggests that **glint and glare can and does adversely affect wildlife**, especially birds, and potentially birds and other creatures which forage at night including owls and bats, due to moon-glare.

I1.37 See for example the paper *All that glitters – Review of solar facility impacts on fauna* by PA Fleming, published in *Science Direct* in July 2025. Fleming concludes as follows, with my emphases:

I1.38 *Solar facilities impact fauna through habitat loss and fragmentation, altered microclimate, and creation of novel habitat.*

*Evidence suggests increases in insect, bird and bat species richness and abundance around solar facilitates built over degraded landscapes, likely due to introduction of novel habitat and presence of generalist species, but a* ***decrease when comparison is made with intact reference landscapes****.*

*… both heliostats (CSP) and* ***PV solar panels are attractive to waterbirds****, with the timing and direction of bird movements indicating they are responding to linear polarised light reflections from panels.*

*While generalist bat species make use of solar facilities,* ***data to date indicates a decrease in bat species richness and activity around solar facilities****.*

*Extrapolating from USA studies, an estimated 17.3 million birds die at solar facilities around the world every year. Direct impacts of solar facilities include injuries and deaths due to collisions and burns, while entrapment, starvation and increased predation risk are also recorded causes of mortalities.*

***Solar facilities significantly impact local fauna****, particularly attracting and affecting insectivores and waterbirds.*

***Further research is needed to fully understand these effects*** *and develop mitigation strategies for sustainable solar energy expansion*.

I1.39 Regarding effects on bats, recent studies note that under certain light conditions, solar panels give rise to a 'lake effect' which can confuse bats (and birds, insects, and other creatures). It is not clear whether night-time glint / glare was a major contributing factor, but recent studies have concluded that lower bat activity occurs within solar developments (see for example Szabadi *et al*, and Tinsley *et al*, both 2023, the report *Insectivorous bats alter their flight and feeding behaviour at ground-mounted solar farms* by Julia Gómez-Catasús *et al*, (Wiley, published June 2024).

I1.40 This matter is highlighted in a letter from the local Wildlife Trust (doc ref SGHS/Ec.2) in which the authors explain the devastating adverse effects which arose during and / or soon after the construction of a solar development within the Gwent Levels SSSI. Teams had carried out post-construction monitoring, and the letter explains that '*the diversity of bat species decreased markedly, and for the majority of locations,* ***abundance of species has dropped dramatically (95- 100%)***'. See also an extract from the July 2025 update on the Trusts' website in Appendix CT-K.

I1.41 Glint and glare can also adversely affect the **settings of heritage assets**, both in terms of how the asset is perceived / experienced within the landscape, and specific views to and from assets.

I1.42 At para. 5.3.13, the GGA report refers to Section 16 of North Northamptonshire Council (NNC)'s *Wind and Solar Energy Supplementary Planning Document* (September 2014), which states that '*There is also potential for glint and glare to have an affect* [sic] *on nearby heritage assets*'. At para. 5.3.15, reference is made to Part B (4) of Policy SC3 of Milton Keynes' Local Plan (MK:Plan) (2016 - 2031), which states that '*Planning permission will be granted for proposals to develop low carbon and renewable energy sources (including community energy networks) unless there would be… Unacceptable harm to the significance of heritage assets*'.

I1.43 However, as far as I can ascertain, the GGA has not identified any heritage assets as receptors, nor considered effects on heritage assets' settings, and the Applicant's Cultural Heritage Assessment (APP-049 ES Chapter 12) does not mention the effects of glint and glare at all.

I1.44 The other assessed glint and glare receptors and the effects are explained below, but here it is very important to note that the majority of GGAs, including this one, do not assess the effects of glint and glare on the safety and visual / other amenity of users of local roads and lanes, only 'major national, national, and regional roads'. Nor do they assess effects on the safety and amenity of users of PRoWs. The reasons for this, and the implications, are also explained below.

<u>Landscape receptors</u>

I1.45 It may not be within the scope of GGAs to assess the effects of glint and glare on landscape character, but they should be included in the LVIA, along with effects on private and public visual amenity. However, as mentioned above, '*The LVIA has considered the conclusions of the Glint and Glare Assessment… in association with an assessment of the magnitude of Landscape and Visual impacts using the methodology prescribed above*'. However, there is **no further discussion nor analysis of the effects**.

I1.46 In summary, my own assessment concluded that glint and glare could result in **high levels of adverse effects on landscape character**.

<u>Visual receptors: private (residential)</u>

I1.47 Regarding effects on residential visual amenity, the Applicant's GGA identifies and assesses effects on a total of 355 dwellings within 1km of the sites (see comments on study area boundary above) at which '*Solar reflections are geometrically possible*'. As an aside, it is useful to note the large number of residential properties at which there would be the potential for glint and glare effects, and that this is only a small percentage of the number whose visual amenity would be adversely affected by other aspects of the development.

I1.48 The GGA concludes that all of the identified residential receptors would experience **Minor Adverse** effects (not significant).

I1.49 However, it is important to note that:

i) The GGA relies on vegetation to screen views for the 60+ years' duration of the project – see main report Section 4.4.

ii) The GGA does not recognise that the total loss of an open view due to the proposed screen planting is likely to result in a **'significant' adverse visual effect** (which was not factored into the LVIA either).

Visual receptors: local roads and lanes

I1.50 Whilst the effects of glint and glare on the safety of people driving along local roads and lanes are **considered** in GGAs, in my experience these receptors are always scoped out of the effects assessment. That is due to a) the informal guidance, b) how GGAs establish levels of receptor sensitivity, and c) the criteria which are set and applied.

I1.51 In this case, at para. 15.4.19, the GGA explains that '*Major National, National, and Regional roads are considered to be of 'Medium' sensitivity due to having higher traffic volumes than local roads. As such, the receptor has moderate capacity to absorb change without significantly altering its present character. **Local roads are considered to be of 'Low' sensitivity due to traffic volumes predicted to be low**. As such, the receptor is tolerant to change without detriment to its character*'.

I1.52 In other words, the criteria are based on **safety and traffic volumes**, with the highest level of receptor sensitivity reserved for roads along which **the highest number of injuries / fatalities would occur**.

I1.53 However, in the LVIA process, visual receptor sensitivity levels are based on the combination of levels of visual value and susceptibility (see main report Section 3.2). Some users of local roads and lanes are of **High** visual sensitivity. Also, in some parts of the country, there can be large amounts of traffic on local lanes.

I1.54 The implications of categorising users of local roads and lanes as Low sensitivity receptors in judgements about levels of effects are explained in the following section.

Visual / amenity receptors: PRoWs and Horse Facilities, also agricultural workers

I1.55 EN-3 para. 2.10.158 states that inter alia, '*the Secretary of State should assess the potential impact of glint and glare on public rights of way…*'. However, the majority of GGAs I have reviewed do not adequately assess effects on the safety **or** amenity of people using PRoWs, for reasons which are explained below (in summary, they are categorised as Low sensitivity receptors).

I1.56 In this case, the Applicant had not intended to assess effects on PRoW users, including equestrians, at all, but as set out in GGA Table 15.1 PINS ID 3.10.3, '*The Planning Inspectorate states that due to a lack of adequate justification, the Inspectorate is not content to scope Public Right of Ways or Horse Facilities out of the ES as per 3.10.3 of the Scoping Opinion.*'

I1.57 Also, in Table 15.1 at PINS ID 3.10.4, PINS asks the Applicant to consider effects on agricultural workers in neighbouring fields.

I1.58 Consequently, effects on the **safety** of both PRoW users (including equestrians) and agricultural users were considered in the GGA; however, GGA para. 15.4.54 explains that '*due to the 'Low' sensitivity and the maximum magnitude of impact of PRoWs and Horse Facilities being 'Low', the maximum significance of impact is considered 'Minor'. This is not significant in EIA terms. As such, **PRoWs and Horse Facilities are not considered further within the assessment***' (my emphasis).

I1.59 The reasons for the Low sensitivity judgement are explained in GGA paras. 15.4.21 and 22, and are similar to reasons given by other GGAs for not considering PRoW receptors any further (the wording for the justification for scoping out agricultural workers is almost identical), ie:

'*The sensitivity of PRoWs and horse facilities is categorised as 'Low' because the receptor is tolerant to change without detrimental effect and are of local importance. Other reasons for this include:*

'*The typical density of users on a PRoW and at a horse facility is low in a rural environment;*

'*Relative to other receptor types, there is less risk to safety. For example, solar glare toward a road network can be much more serious to safety, owing to the high travel speeds and higher density of users; and*

'*Receptors on a PRoW and at a Horse Facility are transient, and time and location sensitive, whereby a PRoW user or user at a Horse Facility could move beyond the solar reflection zone with ease and with little impact upon safety or amenity*.'

I1.60 Firstly, in my opinion it is not acceptable to say that **because receptor numbers are low**, effects upon them do not need to be assessed, only situations where multiple casualties / fatalities could occur. Evidently the result of an accident caused by glint and glare is likely to be far more serious if it involves the loss of or damage to many lives; however, **just one fatality / serious injury along a local lane or PRoW is surely of concern**, especially if it is the result of a development where the risks were known but no attempt was made to avoid or reduce them.

I1.61 Regarding the second point, some of the PRoWs in the study area **are** popular and very well used, especially the long-distance trails, and the footpaths and bridleways which connect them to each other, and to villages where visitors can enjoy the facilities and medieval architecture (see main report, for example Section 7.3).

I1.62 Also note that the GGA does not consider the **sequential** effects of glint and glare, and glint and glare was not factored into the LVIA's assessment of sequential visual effects.

I1.63 Regarding the last point in the reasons given for the Low sensitivity judgement, it is still important to note that ocular damage from glare viewed at very short distances is possible.

I1.64 The **safety of equestrians and horses** is a very important matter.

I1.65 My main report explains that within parts of the study area, equestrians are well-catered for, and the bridleways and lanes are well-used. It also explains that during ISH1, a representative of Lower Farm Livery Stables and associated residential properties which lie **immediately** adjacent to Site G (north of Lavendon, near Lavendon Castle) read out a statement regarding concerns about the effects of the development, including glint and glare affecting a) equestrians and horses using the Milton Keynes Boundary Walk and Three Shires Way long-distance trails which pass by the livery, b) people and horses within the livery itself; and c) people in the associated residential property.

I1.66 Note that in the LVIA, these receptors are categorised as **High sensitivity visual receptors**; also, at other hearings / inquiries, **horses** have been recognised as highly sensitive receptors.

I1.67 After the representative / resident had read out the statement, the Applicant's glint and glare expert explained that for the residential receptors at the livery, and recreational receptors at the livery / using the aforementioned bridleways, the effect of glint and glare would be **Minor Adverse**, as a result of the combination of the receptors being categorised as Low sensitivity, and the Low level of Magnitude **due to screening afforded by the existing dense vegetation**.

I1.68 As mentioned previously, in the LVIA, these are **High** sensitivity receptors.

I1.69 In fact, the **Low** magnitude of impact applies to **all** users of PRoWs and Horse Facilities: at para. 15.4.45, the GGA states, '*The maximum magnitude of impact for PRoWs and Horse Facilities is considered to be 'Low*'. The first reason is because '*It is likely that the existing and the proposed screening will obstruct line of sight between the reflecting arrays and users of PRoWs and at Horse Facilities*'.

I1.70 As explained in the main report, there are many reasons why it is not safe for the GGA (or the LVIA) to rely on vegetation to screen views for the 60+ years' duration of the project. However, in the case of Lower Farm Livery Stables, from the residential properties there are in fact **open**

**views across parts of Site G**, as shown on photographs supplied by the resident. Therefore, it is possible that they could be **significantly adversely affected** by glint and glare.

I1.71 Also, during ISH1 the Applicant's landscape expert confirmed that **no screen planting is proposed along the PRoWs running through solar arrays**, the reason being that the introduction of new hedges would disrupt and therefore give rise to adverse effects on landscape character.

I1.72 In addition, in Table 15.1 at PINS ID 3.10.4, PINS asks the Applicant to '*consider the implications of… users being at varying heights from ground level, as for example, a horse rider would experience glint and glare at a difference angle than a pedestrian*'. From the Applicant's response, it is unclear whether the elevated eye-level was factored into the GGA, but the Applicant's response suggests not, ie '*factors considered when determining the sensitivity and impact magnitude criterium are applicable to all potential users of Public Rights of Way*'; also, as noted previously, equestrians were scoped out of further assessment due to their assumed Low sensitivity. Clarification of this point would be helpful.

I1.73 I do not believe that equestrians' elevated eye-level was factored into the LVIA's visual effects assessment: APP-272 LVIA Figure 8.8 Zone of Theoretical Visibility (ZTV) plan is based on an observer height of 1.7m,, whereas the eye-level of an average adult riding an average 16 hands high horse is c. 2.3 metres above the ground. Again, clarification would be helpful

I1.74 The GGA does not consider glint and glare effects on the **visual amenity** of people travelling along PRoWs (or local lanes).

I1.75 I could not find any explanation for this in the GGA. As far as I can ascertain, NPS EN-3 does not state that glint and glare effects should be confined to **safety** issues. Perhaps it is because these people are identified as receptors but not considered further in the assessment, being categorised as Low sensitivity due to low user numbers; and / or that adverse glint and glare effects on public visual amenity are considered less severe (in terms of the person experiencing them) than those which would be experienced by residential visual receptors, who are always included in GGAs.

I1.76 This matter was the subject of discussion during the Byers Gill solar NSIP [EN010139]. Pager Power had carried out the GGA. In response to one of the ExA's questions, Pager Power explained that '*Other road users, such as walkers, cyclists, and horse riders have not been considered within the study* [because] *In Pager Power's experience, significant impacts to pedestrians / equestrians using the surrounding public rights of way / bridleways are not possible due to glint and glare effects from PV developments*. *This is because: • The typical density of pedestrians/horse riders located at these points is low in a rural environment; • Any resultant effects are less significant than, for example, solar reflections experienced towards a road network whereby the resultant impacts of a solar reflection can be much more serious*'.

I1.77 However, as noted above, I do not consider it acceptable to say that **because receptor numbers are low**, effects upon them do not need to be assessed, only situations where multiple casualties / fatalities could occur. In this case, for the reasons set out above, in my opinion it is likely that glint and glare could give rise to **significant adverse visual effects**.

I1.78 In the case of Lower Farm Livery Stables, the representative / resident's response sets out concerns about the proposed development adversely affecting the business due to clients not wishing to a) ride along fenced-in corridors through solar arrays and other industrialising elements, especially when previously the landscapes were highly rural and unspoilt; and b) not wanting to risk their horses', their own, and others' safety given the likelihood of horses reacting negatively to unexpected noise, activity, or other disturbance, including glint and glare.

## Conclusion

I1.79 In summary, in my opinion, the method used / approach taken in the GGA is flawed and cannot be relied on for decision-making purposes. Levels of adverse effects would be higher than the GGA predicts, and for some visual receptors on and in close proximity to the site, potentially **'significant' adverse**. Levels of adverse effects on landscape character would also be very high.

I1.80 Ideally, the GGA should be revised, and the LVIA / ecological / heritage assessments revised accordingly to factor in the results.

# Appendix CT-J

## Security Fencing

J1.1 The proposed development would require various forms of security fencing.

J1.2 The Applicant proposes security fencing around the perimeter of the solar array areas in the form of '*Deer type wire and mesh and wooden post fencing with a maximum height of 2.5m*'.

J1.3 In fact, this security fencing would have to be erected within as well as around the site, ie along both sides of the PRoWs which cross many of the sites – see effects of these fenced corridors in the visual and amenity effects sections of the main report.

J1.4 The proposed BESS and the DNO substations would require high-security metal fencing (c. 3m high palisade) around the compounds, probably similar to that shown in the image below. Note that the substation complexes and high-security fences would not be removed by the Applicant during decommissioning, so they are likely to remain (or at least, should be treated as) a **permanent** industrialising feature in the landscape.

*Example of palisade fence around substation*

J1.5 However, **the fencing around the solar arrays would have to be far more robust than post-and-wire in order to deter thieves and potentially, satisfy insurance requirements**.

J1.6 Currently, the matter of deer-proof vs high-security fencing at solar development sites is the subject of much debate, including at NSIP hearings. Therefore, I have carried out a great deal of independent research in order to inform my evidence, speaking to and / or communicating with a wide variety of organisations and individuals, from Police crime commissioners and Designing Out Crime Officers (DOCOs) and the National Rural Crime Network (NRCN), to planning officers, developers, consultants, contractors, landowners / managers, insurance companies, and people who have been affected by solar developments, especially in relation to matters such as solar fencing and crime, during both construction and operation.

J1.7 I have also read documents such as *Theft From Solar Farms*[9], and letters / consultation responses to solar development applications from DOCOs – I have also communicated with / spoken to some DOCOs about the issues faced by the Police due to solar crime.

J1.8 More detailed information about the issues can be provided if required, but the first concern is that in terms of levels of landscape and visual effects, there is a significant difference between deer-proof fencing and high-security fencing, as shown in the photograph below (for solar developments, LPS 1175 level 3 fencing is most commonly recommended by DOCOs). As well as the industrialising / urbanising nature of the high-security fences, and their lack of transparency partially screening views, they are also higher.

*Example of LPS 1175 level 3 security fencing from catalogue*

J1.9 Secondly, the use of high-security fencing can result in **adverse ecological effects**.

J1.10 Mammal passes / gates can easily be installed in post-and-wire deer-proof fencing: however, according to the manufacturers, suppliers and contractors I contacted, a) many high-security fences are set into concrete foundations along their entire length and cannot have gaps at the

[9] Published February 2023, produced by Detertech, written by Crime Intelligence and Opal, the latter being 'the Police unit for the United Kingdom developing intelligence to disrupt organised networks involved in acquisitive crime in partnership with the public / private sector'.

bottom; and b) not only would it be very difficult, time-consuming and costly to create mammal passes in the high-security fences, it also would almost certainly render the security rating invalid.

J1.11 Thirdly, my understanding is that due to the high levels of crime which occur at many solar sites, both during construction and operation (one DOCO told me that youngsters have competitions to see how many panels they can break by throwing bricks and stones), some of the insurance companies which cover solar developments are now stating that they will not accept deer- / stock-proof fencing any more.

J1.12 I spoke to several solar insurance companies, and to the British Insurance Brokers Association (BIBA). In summary, the current situation appears to be that BIBA and many of their members are well aware of the solar crime and security fencing problems, and there are moves in the industry to address them. However, their opinion is that progress is likely to be fairly slow. In the meantime, some insurance companies would almost certainly continue to insure solar developments with deer-proof security fencing, although for how long is uncertain. My inquiries suggest that the smaller companies currently would, but the larger ones either would not, or may not.

J1.13 In fact, for some time, one of the larger commercial insurers, Marsh Commercial, has had the following on its forms for solar development insurance applications (with my emphasis):

*<u>Security</u>*

*• Ground Mount - Fencing in place of at least 1.8 m to 2m in height: Yes / No*

*Type of fence installed? (**Note stock fence is not adequate**).*

*Security Standard BS EN 1722?*

# Appendix CT-K

## Gwent Levels Gwent Wildlife Trust Website Extract

17th July 2025

Recent surveys of the Llanwern solar plant on the Gwent levels highlight a severe decline in the Lapwing breeding colony and Shrill Carder Bee activity. There is also concern about a significant drop in the protected bat population. The very rare breeding Eurasian Cranes have disappeared altogether.

The latest evidence, presented at the recent Planning and Environment Wales hearings regarding a new solar development, Wentlooge Solar, follows a study commissioned by the Welsh Government on the effects on wildlife following the construction of the Llanwern solar plant highlights the serious harm caused to waterways by leakage of dangerous pollutants.

The impact of the 145-hectare Llanwern Solar plant built wholly within two SSSIs is devastating, and highlights the myth of mitigation three years after the project began operating.

One of the key issues is water pollution in the reens and ditches, affecting otters and water voles, as well as rare aquatic flora and fauna including many European protected species.

Pollution includes cadmium, which can cause long-term harm to animals and humans, and lead, linked to immune system damage, neurological problems, and oxidative stress, which is potentially carcinogenic.

A Welsh Government decision regarding Wentlooge Solar is looming – yet this scheme is proposed for the same sensitive landscape as Llanwern, despite the Welsh Government's own report highlighting the catastrophic damage already wreaked on this internationally important and irreplaceable wetland.

In addition to water pollution, the report details many other adverse impacts on wildlife, including:

- Lapwing numbers declining: the new "Lapwing Mitigation Area" has not attracted a single lapwing pair three years after construction. In the retained areas, breeding pairs declined from eight before construction to two after, with only one nest found on-site and no successful breeding confirmed in 2023;
- Key bee species numbers down: there have been significant declines in Shrill Carder Bee and Brown-banded Carder Bee populations within the solar array areas. Herbicide treatments on thistle plants (a favoured nectar source for the bees) in retained grassland areas and poor establishment of new wildflower planting areas are cited as possible causes;
- Bat activity declining: the level of bat activity (recorded as number of passes) on site has greatly declined, with only a single installed bat box occupied in 2023;

- Extremely rare Eurasian crane gone: prior to construction (2020-21), a pair of Eurasian Cranes were in the area, with hopes that more would follow. They have not been seen since.

[redacted], Gwent Wildlife Trust CEO, says of the report (Gwent Levels Post Construction monitoring, part of the evidence base for Gwent Levels Future Wales: Policy 9 Pilot Project - details the damaging effects of such large developments built within and adjacent to the Gwent Levels SSSI).

"*These findings show, unequivocally, that mitigation measures to protect wildlife within the fragile and complex wetland ecosystem of the Gwent Levels SSSI, have failed catastrophically. The Levels waterways are home to many rare species, and high levels of pollution from solar plants will damage them irrevocably*".