

**PROPOSED DEVELOPMENT OF A SOLAR PARK,
AT BILSHAM FARM, WEST SUSSEX**

LANDSCAPE AND VISUAL ASSESSMENT

for

BNRG RENEWABLES LTD

October 2013



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SUMMARY

This landscape and visual assessment has been prepared to inform a planning application for the development of a photovoltaic (PV) power generating installation (a 'Solar Park') within approx. 36 hectares of arable farmland at Bilsham Farm, Yapton, West Sussex, BN18 0JX (OS map ref: SU960024). The site lies approximately 0.3 km west of the village of Bilsham and comprises flat, arable farmland partially bounded by hedgerows with trees. The proposed development involves the installation of PV panels of approximately 14.5 MW in capacity, with associated infrastructure and equipment.

The local landscape has been assessed to be in good condition, of medium and regional value and its character is of medium sensitivity to development. The application site lies within the intensively farmed, low lying, south coast plain which forms part of the larger Hampshire Basin which is characterised by highly productive medium-large scale arable fields in a landscape of fragmented hedgerow, hedgerow-tree patterns and small clusters of woodland. In the surrounding area there are scattered farm buildings and silos, clusters of glasshouses, scattered, historically nucleated villages of mixed building materials including flint, brick, half-timber and stone. Fragmentation/loss of hedgerows and connections between hedgerow and woodland is one of the key sensitivities of the character area. The recommendations to "link up existing remnant hedgerows and tree lines to re-establish coherent field boundaries and wildlife corridors" are well met by the mitigation principles of the proposed development. This will result in a medium to long term beneficial effect of moderate significance.

The area of and immediately around the application site has no international, national or local designations within 4.5 km. The South Downs National Park is located 5 km to the north and contains local nature reserves, some scheduled monuments and SSSIs.

The application site is visually quite open, being set within a landscape of flat topography. There is a small wood located in the centre of the site, adjacent to a stone barn approximately 8m tall. A tall hedgerow is located on the northeast and eastern boundaries of the site which, along with the woodland to the east of the site, screen views to the north and east – which includes from the villages of Yapton and Bilsham. Also, due to the presence of many hedgerows and small woodlands around the site there are no medium to long range views in the flat landscape.

Because there are no hedgerows on the southeast, west and northwest boundaries, the site is locally visually open to views from a series of public footpaths within close-proximity. Thus, the public footpaths that pass within 20 m of the site will have unrestricted views of the proposed development. Further than 200 m, the views of the site become partially screened as the landscape is characterised by the presence of discontinuous hedgerows and small clusters of trees that serve to screen most of the site.

Because the landscape is very flat, there are no views of the proposed development site further than 700 m away with more than a Moderate adverse visual impact. Although the South Downs National Park is visible from the site, any views of the proposed development from the high ground of the National Park are negligible, being located over 5 km to the north, as identified during the assessment.

The proposal is to install solar panels, approximately 14.5 MW in capacity, along with associated equipment. The proposed development comprises the installation of a number of rows of solar panels (called 'arrays').

The solar arrays will be laid out to maximise the production of electricity, with the panels angled and orientated to optimise their exposure to direct sunlight. The lack of mature trees within the site minimises the space that would be lost due to potential overshadowing. All development will be kept well away from the boundaries where occasional groups of trees are located that could potentially cast shadows. The site itself will be developed by maintaining the topsoil in situ.

Each solar array comprises a number of panels supported on steel supports driven directly into the ground, to a depth of 1-2 m depending on the ground conditions. The panels are then bolt anchored to a metal frame (table) which will be mounted onto the posts. The panels are then connected by cabling running along the back of the tables. Each section of the array will be connected to an inverter which, in turn, is connected to the site's transformer housing. This structure will house the main transformer and its connectivity hub.

The arrays will be set apart by approximately three times their overall height in order to avoid shadowing, although the exact distance will depend on the detailed topography of the site and will be designed to ensure optimum energy generation. The solar panels are fixed and will not track the sun by motors; no noise, therefore, will be emitted from the panels. The supporting electrical equipment will be kept within weatherproof containers and so will not emit noise above the ambient level.

It is proposed that the site is developed and used for solar energy production for a fixed period of 30 years thereby ensuring that any long-term impacts remain limited in duration. The site will then be decommissioned in its 31st year, the infrastructure removed and the land returned to full agricultural use.

Site security is an essential part of the successful operation of a ground-mounted PV array. The naturally attractive nature of a large number of PV panels will require a security perimeter fence to be erected. This fence will act as a deterrent from both human and animal interference. Careful selection of materials for the construction of the fence will ensure that the fence will not be detrimental to the visual environment but may, in fact, aid the visual screening of the PV array.

The main landscape effects include partial temporary loss of existing arable land during construction and the temporary and reversible alteration to the appearance of the application site's land cover during operation. All hedgerows, trees, woodland and field shapes and sizes will be retained intact and, as a result, the landscape will not suffer any permanent alteration.

The proposed development will initially result in some major adverse impacts on the character of the local landscape, but these are impacts that are contained to a small, localised area. Once mitigation measures have established (approximately 5-7 years) the development will be screened from view to the extent that these impacts will become negligible or gain minor beneficial impacts. Once decommissioned, with the mitigation planting measures left in place, the character of the local landscape will have gained minor beneficial impacts.

There will be no significant views of the proposed development from the settings of any designated heritage assets, such as Listed Buildings and Scheduled Monuments. During construction and the first few years of operation the proposed development will potentially result in major visual impacts on the visual amenity of PRow receptors immediately adjacent to the site. This affects approximately 600 m of footpath to the northwest of the site and 500 m of footpath on the southeast edge of the site. There are no dwellings with significant views of the site.

Once mitigation measures have established over a period of 5 to 7 years they will effectively screen all views into the development and the visual impacts will be reduced to that of negligible significance or gain some minor beneficial enhancements to views.

Overall, it is considered that the proposed development along with its mitigation planting is acceptable in terms of landscape and visual impact.

GLOSSARY

For the purposes of this report the following terms are used to describe the components of the proposed development:

Glare:

The term for a continuous source of brightness, relative to diffused lighting. Unlike 'glint', this is not a direct reflection of the sun, but is instead a reflection of the bright sky around the sun. Glare is generally significantly less intense than glint.

Glint:

Also known as specular reflection. An effect that is produced by direct reflection of the sun in the surface of the PV solar panel. This is likely to be transient but can be the main concern in terms of visual issues regarding viewer distraction.

Inverter:

A type of electrical device that changes the direct current (DC) electricity produced by a photovoltaic material into alternating current (AC) that is suitable for feeding into the national grid.

Module:

A manufacturer assembled group of Solar PV Cells within a supporting frame that provides simple interfaces to, and physical protection for the cells.

Photovoltaic (PV):

Material that converts solar radiation into direct current electricity

Solar panel:

A manufacturer assembled group of Solar PV Cells within a supporting frame that provides simple interfaces to, and physical protection for the cells.

Solar park:

The collective term for an installation of equipment and infrastructure that forms a photovoltaic power generating installation

Solar PV Array:

A group of Solar PV Panels or Modules.

Solar PV Cell:

A single, none divisible group of Photovoltaic Material, which can generate electricity from Solar Energy.

Substation:

A group of Electrical Switchgear that connects the Solar PV Park to the National Grid.

Table:

The supporting framework onto which a number of Solar PV Panels are mounted.

Transformer:

An electrical device that transfers electrical energy from one voltage level to another.

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APPENDIX A: Landscape and visual assessment criteria

1.0 INTRODUCTION

- 1.0 This landscape and visual assessment has been prepared to inform a planning application for the development of a photovoltaic (PV) power generating installation (a 'Solar Park') at Bilsham Farm, Yapton, West Sussex, BN18 0JX (OS map ref: SU960024). The application site comprises three arable fields, together totalling 36 hectares (**Figures 1 and 5 refer**).
- 1.1 This report assesses the significance of the impact of the visual changes arising from the proposed development, together with the changes to the character and quality of the landscape.
- 1.2 The existing landscape character and the visual environment have been separately surveyed and assessed. The landscape assessment identifies characteristics, features and elements which constitute this particular landscape and its character. The visual baseline identifies existing views to, across or from the application site, and identifies the visual receptors, such as nearby residents or users of Public Rights of Way (PRoWs) who might be affected by the proposed development.

2.0 LANDSCAPE PLANNING CONTEXT

International Landscape designations

- 2.1 There are no international landscape designations relating to the application site or its immediate surroundings.
- 2.2 There are several non- landscape designations in the region including RAMSAR sites, Special Areas of Conservation (SAC) and Special Protection Areas (SPAs) within the Chichester Harbour AONB and to the south west of Bognor Regis within the Pagham Harbour SSSI, 9 km southwest of the site. None of these are applicable in the scope of this report.

National Landscape Designations

- 2.3 The application site does not lie within any area which is nationally designated for its landscape value or historical and cultural value, however the South Downs National Park lies 5 km to the north and the Chichester Harbour AONB lies 11km to the west.

National planning policy

- 2.4 The NPPF sets out 13 key categories to support the 12 core planning principles in the delivery of sustainable development. Category 11 'Conserving and enhancing the natural environment', paragraph 109 notes that the planning system should contribute to and enhance the natural and local environment by, inter alia:

"Protecting and enhancing valued landscapes, geological conservation interests and soils"

- 2.5 With regard to developments that might affect protected species, geodiversity sites or landscape areas, paragraph 113 advises that:

“Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife or geodiversity Sites or landscape areas will be judged. Distinctions should be made between the hierarchy of international, national and locally designated Sites, so that protection is commensurate with their status and gives appropriate weight to their importance and the contribution that they make to wider ecological networks.”

- 2.6 In terms of the significance of different landscape designations, paragraph 115 states:

“Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty. The conservation of wildlife and cultural heritage are important considerations in all these areas, and should be given great weight in National Parks and the Broads.”

Government Planning Practice Guidance

- 2.7 Planning Practice Guidance for Renewable and Low Carbon Energy states that the visual impact of a well-planned and well screened solar farm can be properly addressed within the landscape if planned sensitively (Para 26). Additionally it is stated that local planning authorities should assess large scale solar schemes on the potential to mitigate landscape and visual impacts through for example, screening with native hedges (Para 27, Bullet 7)

Local Plan Policies

- 2.8 Key local planning policy references and policies pertaining to the protection of landscape resources are found in:

- Saved Arun District Local Plan

POLICY GEN1 Sustainability

- 2.9 All development must take full account of the need to protect the environment so that present-day demands do not compromise the ability of future generations to meet their own needs or enjoy a high quality environment. All development must reflect the need to safeguard and improve the quality of life of residents, conserve energy resources and protect and, where possible, enhance the Plan area's essential character and environmental assets such as: the Sussex Downs AONB; the general attractiveness and diversity of the landscape; the open and undeveloped nature of the countryside; areas of wildlife and ecological value; the setting, form and character of settlements; the quality of natural assets, such as air supply, water environments and high quality agricultural land; buildings and areas of historic and architectural interest; sites of archaeological importance; land of recreation and amenity value; the public rights-of-way network.

POLICY GEN3 Protection of the Countryside

- 2.10 Outside the Built-Up Area, as defined on the Proposals Map, the countryside will be safeguarded for its own sake. Development will not be permitted unless:

(i) ...it meets the operational needs of agriculture, forestry, the extraction of minerals or the deposit of waste; or

- (ii)... for quiet, informal recreation; or*
- (iii)...for the diversification of the rural economy; or*
- (iv)...for essential road schemes; or*
- (v)...it is in accordance with a policy in Sections 2 and 3 of the plan referring to a specific use or type of development.*

- 2.11 Permission will not be given for the extension of isolated groups of buildings or the consolidation of linear or sporadic development unless the proposal accords with criteria (i) to (iii) or (v).

POLICY GEN16 Public Rights of Way

- 2.12 The Council will protect the rights of way network and will support and encourage improvements and enhancements. Development will not be permitted which would have an adverse impact on the use of a right-of-way. The rural characteristics of rights of way outside of the built up area boundaries should be retained.

POLICY GEN21 Renewable Energy

- 2.13 Planning permission will be granted for development for renewable energy generation provided that:

- (i)...there is no significant harmful environmental effect on the quality of the natural and built environments;*
- (ii)...there is no unacceptable impact on the amenity of neighbouring residents;*
- (iii)...there is no adverse effect on public safety;*
- (iv)...development will make a contribution to meeting need on a local, regional or national basis and the reduction in emissions of damaging greenhouse gases.*

POLICY GEN27 Landscape Diversity

- 2.14 Development which would have an unacceptable adverse impact on individual features or the character of the landscape will not be permitted.

POLICY DEV11 Setting of Listed Buildings

- 2.15 Proposals which adversely affect the setting of a Listed Building, or group of Listed Buildings, will be resisted. Where the principle of development in the grounds of, or near to Listed Buildings is acceptable, it should be sensitively designed and constructed of appropriate materials to ensure that the special qualities of the older buildings remain unimpaired. Where relevant, appropriate space about the building or buildings must be retained. Proposals for more distant buildings and tall structures, including pylons and masts, will be carefully assessed in respect of their effect on the settings of Listed Buildings.
- 2.16 The Saved Arun Local Plan is in the process of being replaced by the emerging Arun Local Plan (2011-2029). Given however that there is no timetable for agreeing and publishing the Draft Local Plan, little weight can be attached to these policies as part of the planning process.

Local Landscape/Cultural Designations

- 2.17 There are no local landscape designations over or near the application site. The nearest listed buildings are:

Old Bilsham Farmhouse (II), 750 m southeast of the site

Four grade II properties including Flansham Farmhouse and Flansham Manor, approximately 750 m southeast of the site.

The Chapel (II), 800 m southeast of the site

Bilsham Manor (II), 850 m southeast of the site

Barnham Court and associated buildings (II), 850 m northwest of the site.

Hobbs Farmhouse (II), 1 km southeast of the site

Various properties in Yapton; properties that face the site include Yapton Evangelical Free Church, The Old Malthouse, Bonhams Farmhouse and Laburnum Cottages, 1.3 km northeast of the site

Barnham Windmill and Ivy cottage, 1.4 km north of the site

Lidsey House, 1.8 km west of the site.

- 2.18 Within a 2 km radius, there are multiple listed buildings, on all sides of the site. Of these there are thirteen Grade II listed within 1 km with potential views of the site. They are situated to the south, north and west are located within the small villages of Bilsham, Yapton, Barnham and Flansham.

- 2.19 There are two conservation areas close to the site – one at Yapton and the other at Barnham. This information is displayed on **figure 4**.

- 2.20 There are no scheduled monuments within a 5 km radius of the site.

Countryside recreation

- 2.21 The landscape surrounding the site is rich in a network of Public Rights of Way (PRoW). There is a PRoW running along the northeast boundary, on the opposite side of a deep drainage ditch. This footpath links with a forked footpath to the southwest and to the north it turns 90 degrees and heads towards Barnham. There is also a PRoW along the outside of the south-eastern red line boundary. It runs down Drove Lane and along the inside edge of the drainage ditch via a muddy track until halfway down the boundary and then moves across to the outside edge of the watercourse before splitting east, to Flansham and south, across a small footbridge near the south corner of the site.

- 2.22 The various PRoWs around the area form around the rectilinear field boundaries and connect towns to the north to the coastal town of Bognor Regis to the south. The paths are popular with walkers and cyclists.

- 2.23 The various relevant designations are presented in **Figure 4**.

3.0 ASSESSMENT METHOD

The Theoretical Zone of Visual Influence

- 3.1 The study area is determined by the Theoretical Zone of Visual Influence (TZVI). This is generated by computer software which places a 3 m high structure (slightly higher than the maximum height of the panels) on the highest point of the application site and one at each corner and then calculates the TZVI based on a 3D topographical terrain map. The TZVI is based on topography alone and does not take into account trees, hedgerows and buildings which will provide additional screening.
- 3.2 The actual extent of the Zone of Visual Influence (ZVI) is then determined during a site visit by a qualified landscape professional, using the TZVI as guidance. The actual area from which the proposed development will be visible is determined by observation from the highest point on the application site and then by visiting receptors in the surrounding landscape.
- 3.3 The TZVI is shown in **Figure 3**.

Data Collection and Guidance

- 3.4 This assessment has followed guidance set out in the '*Guidelines for Landscape and Visual Impact Assessment*', Third Edition (Landscape Institute and the Institute of Environmental Management and Assessment, 2013).
- DECC National Policy Statement for Renewable Energy Infrastructure (EN-3)
 - Landscape Character Area as defined in the unpublished West Sussex Landscape Character Assessment (November 2003)
 - Natural England National Character Areas
 - National Planning Policy Framework
 - Photography and Photomontage in Landscape and Visual Impact Assessment, Landscape Institute Advice Note 01/11
- 3.5 Existing background Information on the study area has been sourced from:
- Ordnance Survey – 1:50,000 and 1:25,000 scale maps.
 - Magic website (www.magic.gov.uk)
 - Google Earth and Street View
 - Bing maps (www.bing.com/maps)
 - West Sussex Council Interactive Mapping website (<http://www2.westsussex.gov.uk/lvmaps/imap.html>)
 - GIS designation data sets from Natural England and English Heritage

Receptors

- 3.6 This study identifies the receptors within the landscape which may be affected by the proposed development. The types of receptors assessed are described below:

Landscape receptors

- 3.7 These are individual elements of the landscape fabric and the area's landscape character that may be affected by the proposed development.

Landscape elements

- 3.8 Landscape elements include physical features such as trees and hedgerows, topography, watercourses and structures. Impacts to these elements may arise where valued features are lost, gained or substantially modified as a result of the development. The loss or depletion of important landscape features can adversely affect the character of the landscape. Conversely, the addition of significant beneficial features can constitute an improvement in landscape character.

Landscape character

- 3.9 Landscape character is defined as:

"A distinct, recognisable and consistent pattern of elements, be it natural (soil, landform) and/or human (for example settlement and development) in the landscape that makes one landscape different from another, rather than better or worse." (Natural England)

- 3.10 Impacts on the landscape may arise where the landscape character of the area is modified by the development. It is important to consider the application site and the proposed development in its landscape context.

Visual receptors

- 3.11 Visual receptors are those locations from which it is possible to obtain views of the application site. These views may be partial or full, glimpsed or direct. Impacts on the visual amenity of a particular location may arise where features intrude into or obstruct views, or where there is some other qualitative change to the view.
- 3.12 Views from such receptors are illustrated by photographs taken from key viewpoints (**Figure 11**). These have been located on a plan (**Figure 6**). Receptors may be private viewpoints, such as views from domestic residences, or public viewpoints like highways, footpaths or other places with public access.

Analysis of landscape and visual receptors

- 3.13 Each receptor is assessed first in terms of its value and importance as a receptor. This value is then combined with an assessment of each receptor's vulnerability to the changes proposed. This process gives the assessor a rational basis on which to assign the receptor a level of sensitivity to changes in the landscape or visual environment
- 3.14 The sensitivity level is then combined with the predicted magnitude of change to the receptor arising from the development. The nature of the effect, its duration and reversibility are all considered and used to determine the significance of the effect on each receptor resulting from the proposed development.
- 3.15 The methodology for the analysis of the receptors is set out **Appendix A**. The methodology determines the degree of significance of the impact, the definitions for which are set out in **Table 1** below.
- 3.16 It is not straightforward to predict how a solar park will be visually perceived in the countryside and so, for the purposes of this assessment, a 'worst case' approach has been adopted and it is assumed that the panels, if visible, will be regarded as intrusive structures within the landscape. As with wind turbines, public perception can be mixed; some people find them intrusive, others consider that they are an acceptable feature of the landscape, particularly if it is appreciated that they are providing green energy.

Generally solar parks are likely to be far less visible than wind turbines due to the low height of the structures and many regard them as a more acceptable alternative. People's perception or tolerance of renewable energy schemes is often mitigated by an understanding of a 'greater need' for such developments.

Table 1: Significance Criteria

Significance	Definition
Major adverse	The proposed development will cause substantial degradation of the landscape character/landscape features/existing views. These adverse effects are key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category.
Moderate adverse	The proposed development will cause noticeable degradation of the landscape character/elements/existing views. These adverse effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
Minor adverse	The proposed development will cause small degradation of the landscape character elements/existing views. These adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project.
Negligible adverse	The proposed development will cause barely perceptible degradation of the landscape character/elements/ existing views.
Neutral	Beneficial effects balance out adverse effects such that there is no overall beneficial or adverse effect
No significance	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.
Negligible beneficial	The proposed development will cause barely perceptible improvement to the landscape character/elements/existing views.
Minor beneficial	The proposed development will cause a small improvement to the landscape character/elements/ existing views.
Moderate beneficial	The proposed development will cause noticeable improvement to the landscape character/elements/ existing views.
Major beneficial	The proposed development will cause substantial improvement in landscape character/elements/existing views. In making a decision about the proposal this advantageous effect may be considered to compensate to some degree for other, non-landscape, adverse effects.

Limitations to survey methods

- 3.17 The landscape character and views have been assessed from public vantage points. Although there is no right in planning law to a view from a private property, visual impact assessment protocol normally requires such views to be considered. In this case, however, it was impractical to seek access to private property. Potentially significant private viewpoints have, nonetheless, been established from a relevant similar public viewpoint for which access was possible. All assessment work has been undertaken at ground level and on foot.

- 3.18 The photographic survey work was undertaken on Friday 20 September at a time when the deciduous trees were in leaf and the hedges had a season's extension growth. Thus the screening effect of this vegetation is most effective at this time of the year. Visibility across the landscape is greater in winter and so allowance has been made in making the assessment of visual impact.

Photography and imaging

- 3.19 The photographic surveys were carried out by qualified Landscape Architects who are well versed with the methods and best practice required to produce verifiable photographs to be used in LVIA and visual representations.
- 3.20 Photographs illustrating views from each viewpoint were taken using a Nikon D40 digital camera taken in portrait format at 55 mm. The best focal length to use to represent the view available to the human eye varies between different makes and model of digital camera. The method we used to establish the correct focal length setting for the camera and lens used is to repeatedly compare the view through the optical viewfinder with that seen by a single naked eye and adjust the focal length to accurately match the views.
- 3.21 Individual frames have been stitched together with '*Photo stitch*' software. These panoramic views give a better understanding of the receptor's visual context.
- 3.22 These panoramas are used as a base to create accurate photomontages of the PV array and ancillary structures as proposed in the landscape. This was achieved using software to model 3D digital terrain data and the proposed structures and to visualize the PV array from virtual viewpoints set up in the same locations as the panoramic photographs were taken.
- 3.23 The presentation document showing eight photographic viewpoints is designed for ease of handling on site or in an office. An A3 paper size was used to avoid the expense and inconvenience of printing larger formats.
- 3.24 If pdf images are to be viewed on-screen, the pdf needs to be zoomed to actual size one eye at a distance of 500 mm.
- 3.25 If paper images are to be viewed, the viewing distance for all of the photographs, unscaled and on A3 paper, is 500 mm and they should be viewed using only one eye with the paper curved in the horizontal plane. This approach, which enables viewing of the entire panorama at a uniform distance of 500 mm from the eye, gives a view very close to that experienced by a single naked eye when stood in the correct position at the viewpoint.

Technical Image data

- 3.26 The detailed technical Image data listed for each photograph is presented on the photo sheets in **Figure 11**.

4.0 LANDSCAPE BASELINE

Topography and watercourses

- 4.1 The application site lies within a very flat landscape with little or no high points, the nearest notable high point lying in the South Downs National Park approximately 7 km to the north. This flat landscape is, sub-divided with a series of drainage ditches which connect to Ryebank Rife and Lidsey Rife, to the south of the site. These lead out to the English Channel, 2.5 km to the south. Topography is illustrated on **Figure 2**.

Land Use

- 4.2 The application site comprises medium to large scale agricultural land, largely arable, set amongst a landscape of gappy hedgerows, small clusters of woodland and tall grasses that follow drainage ditches. There are a many public foot and cycle paths in the area which are well used, linking the inland villages to Bognor Regis and the coast. There are a number of farm buildings with a variety of materials, including stone, metal, brick and timber. The villages in the area tend to be small and closely linked to one another, almost visually coalescing. The aerial photograph in **Figure 5** illustrates land use and the type of vegetation cover.

Land to the northeast

- 4.3 The northeast boundary of the site is marked by a tall hedgerow (approximately 3.5m), with one large gap in the middle and several smaller gaps at its northern end. Beyond this the landscape is comprised of flat agricultural land with a series of rectilinear fields and hedgerow borders. Drove Lane Farm is situated next to the Drove Lane, which forms a straight line route towards the village of Yapton, 1.5 km to the northeast of the site boundary. Other PRoWs follow field boundaries, drainage ditches and tree belts as they zigzag around the landscape.

Land to the southeast

- 4.4 The southeast site boundary is a tall hedgerow in the east, but open to the south. A drainage ditch here diverts the PRoW to the south. The landscape beyond is comprised of a small woodland located at the end of Drove Lane and surrounded by drainage ditches. There is a PRoW that leads south off the end of Drove Lane and another that branches off to the east across flat agricultural land, towards Bilsham – a very small settlement of farm buildings.

Land to the southwest

- 4.5 The south-western Site boundary is dictated by a drainage ditch and some occasional hedgerow remnants or small trees. Towards its western end it is largely open, facing out onto a landscape of drainage ditches, which are crossed by public footpath bridges. The landscape here is criss-crossed by tree belts. To the south lies Flansham – a small suburb of Bognor Regis, which lies beyond. The landscape to the west is more industrial with the presence of new house building and a railway. This has closed many of the PRoWs temporarily. Beyond the railway there is a plant nursery and then the A29 – a main road which runs from Woodgate, through Lidsey and Shripney towards Bognor Regis.

Land to the northwest

- 4.6 The northwest site boundary is open to views as it is delineated by the line of a deep drainage ditch which has no adjacent hedgerows. A well-used public footpath is situated immediately to the north of the ditch. The footpath connects to Barnham, 600 m to the north. The fields around here are occupied by horses or used as arable farmland. A railway sweeps around to the northwest and visually encloses the landscape. Barnham is enclosed by hedges and trees, but there are small farm buildings on the edge of the village with views out across the flat landscape.

Landscape features

- 4.7 Internally, the site has several features including:
- A small woodland located near the centre of the site, in a north-south orientation approximately 200 m x 40 m in area
 - A smaller tree belt in the east of the site between fields 2 and 3.
 - A stone barn, approximately 8 m tall near the centre of the site
 - A set-aside area of rough grass along the south-western edge of the site.
 - Tall, gappy hedgerows on the northeast, east and south sections of the site boundary. Other parts of the site boundary are only marked by drainage ditches.

Landscape character***National***

- 4.6 Referencing Natural England National Character Areas NCA 126: South Coast Plain, in the report the key characteristics of the area are described as follows:

Key Characteristics

Major urban developments including Portsmouth, Worthing and Brighton linked by the A27/M27 corridor dominate much of the open, intensively farmed, flat, coastal plain.

Coastal inlets and 'harbours' contain a diverse landscape of narrow tidal creeks, mudflats, shingle beaches, dunes, grazing marshes and paddocks. From the Downs and coastal plain edge there are long views towards the sea and the Isle of Wight beyond.

Trees are not a dominant feature – there are some small woods and a few windswept individual trees in the farmland or the occasional poplar shelter belt.

A pattern of large arable fields, defined by low hedgerows, are often interspersed by horticultural glasshouse 'estates' and isolated remnants of coastal heath.

The complex series of creeks, mudflats and shingle beaches along the coastal edge becomes less apparent to the east with the intensively-farmed plain increasingly dominated by disordered seaside towns and leisure developments.

Local

- 4.8 Referencing the West Sussex Landscape Character Assessment, the application site lies near the boundary of two character areas. In the report the Character Area is described as follows:

Sheet SC9 – Chichester to Yapton Coastal PlainOverall character

- 4.7 *This Character Area extends from Chichester in the west to the edge of the Arun Valley in the east, and around Bognor Regis to the south. Over time a large part of this area has been reclaimed from the sea, and remains below the current high spring tide level. It comprises a mainly flat, open landscape crossed by meandering rifes. Dominated by highly productive arable fields and modern farm buildings, it has a fragmented hedgerow and hedgerow tree pattern. The spire of Chichester Cathedral is a widely visible feature. Rows of large light reflecting glasshouses, equestrian facilities, horse paddocks and industrial buildings, for instance in the Ford and Tangmere areas, are strong suburban elements. Where these occur, they create visual confusion and poor definition between town and countryside, and erode distinctive landscape character. Major suburban settlements in the area are Tangmere, Barnham, Yapton, and Westergate. In contrast, there are areas of a smaller scale, more varied rural landscape with quiet hamlets and traditional villages enclosed by small pastures.*

Key Characteristics:

Low lying flat open landscape

Meandering rifes and straight drainage ditch systems, with associated unimproved grassland and edged by reed beds

A low density of hedgerows and hedgerow trees with occasional shelterbelts

Large-scale arable farming and market gardening. Extensive farms with both traditional and modern farm buildings and silos

Clusters of glasshouses

Scattered, historically nucleated villages with mixed building materials of flint, brick, half-timber and stone

Large farmsteads along roads, and on dead-end tracks

Long views to Arundel, the Downs and to the distinctive spire of Chichester Cathedral

The relatively open character of much of the area allows long views so that village church towers are important landmarks in views

Frequent urban fringe influences of horse paddocks, light industry and disused airfields, with busy minor and major roads

The urban fringes associated with Bognor are particularly obvious, with sporadic urban development in suburban settlements of Tangmere, Barnham, Yapton and Westergate

Large gravel pit lakes around the edge of Chichester

Few trees or hedgerows, partly as a result of Dutch Elm Disease, from the 1970s and the Great Storm of 1987 and overall high quality agricultural land, although, where they do exist, they form prominent features

Light industry in the countryside at Ford and Tangmere

- 4.8 The solar farm will be mitigated in the landscape through the introduction of new hedgerows and tree planting. This will have a positive effect on ecological value, and improve the visual character of the gappy hedgerows that have degraded over time. It is possible that mitigation of the site will reduce the openness of the landscape, but there are already limited long-range views due to the presence of tree belts and hedgerows in a flat landscape.
- 4.9 Because solar panels are aesthetically similar in character to the existing poly tunnels and glasshouses (located around Shripney, to the west of the site) the proposal will not be completely out of character with other land uses in the area.

Landscape value, vulnerability and sensitivity to development

- 4.10 The landscape features within the study area are generally in reasonable health, and the landscape is well managed, however most hedgerows have gaps or have grown out into sparse tree belts. The landscape features that do exist are strong components contributing to the distinctiveness of the local landscape and there are very few intrusive elements. Landscape quality is therefore considered to be High/local as assessed in accordance with criteria in Table A.1 (Appendix A refers). It is considered that the application site can absorb change due to the strong tree and hedgerow structure in the area and limited vantage points to view the site from the surrounding landscape.

5.0 VISUAL BASELINE

- 5.1 A set of representative public and private public viewpoints have been selected using desk study, the ZVI and field work. These are listed in Table 2 in Section 7. This table describes the existing view and then the changes arising from the proposed development. For more detail on the assessment methodology please refer to **Appendix A**.
- 5.2 The photographs taken from each public viewpoint are presented in **Figure 11**. It has not been possible to take photographs from individual private properties. Where possible representative photographs have been taken from the nearest publicly accessible viewpoints and so the visual impacts from these receptors are estimated.
- 5.3 The site is visually well seen from the nearby PRowS around the site, but after a distance of a few hundred metres in every direction there are intervening hedgerows, woodland and buildings which screen views. The exception to this is the open aspect to the northwest and north, where there is no site boundary hedgerow and the agricultural landscape is more open with, until the edge of Barnham, little or no intervening hedgerows.
- 5.4 Due to the flat topography there are no medium to long distance views of the site.

Predicted evolution of baseline without the proposed development

- 5.5 The application site is currently under a regime of mixed grazing and arable farming. The boundaries are well maintained and contribute positively to the character of the local landscape. There is no reason to suggest this would change if no development were to proceed.

6.0 THE PROPOSED DEVELOPMENT

Construction and Layout

- 6.1 The proposed development involves construction of a solar park with associated infrastructure and equipment on agricultural land. The masterplan is illustrated in **Figure 8** and details of the panels and security fence are shown in **Figures 9 to 10**.
- 6.2 The proposal is to install solar panels, approximately 14.5 MW in capacity, along with associated equipment on 36 hectares of land. This will comprise solar photovoltaic cells located in groups and rows, which are called arrays.
- 6.3 The solar panels are fixed and will have no moving parts. There will therefore be no noise emitted by the arrays. Similarly the supporting electrical equipment will not emit noise above the ambient level and certainly would not be audible from outside the confines of the site boundaries.
- 6.4 With no moving parts to the solar arrays there is little risk of mechanical failure. The panels are designed with an expected lifetime of 30 years with only a marginal loss of efficiency. This ensures that any long-term impacts of the development remain small-scale.
- 6.5 The panels will be bolt anchored to a metal frame (table), which will be mounted on steel posts driven or secured into the ground (the pile driven sub-construction method). No substantial areas of concrete construction will be required, with the possible exception of foundations for the inverter and transformer stations.
- 6.6 The solar panels will be connected to inverters by cabling which are necessary to convert the DC current generated by the PV modules into AC current. The AC current is then fed into transformers where the voltage is changed (usually from 340 to 11,000 volts) for transmission of the energy with minimum losses to the point of connection to the grid. The inverters and transformers will be housed in buildings (referred to as 'stations') that have a small footprint of 28 m² each.
- 6.7 There is also a requirement for a primary substation compound of circa 10 m x 10 m to be placed on site. This compound will be located within the centre of the site.

Layout

- 6.8 The solar array has been laid out to maximize the production of electricity, with the panels being angled and orientated in a landscape view to optimise their exposure to direct sunlight. The gentle sloping, south facing nature of the site makes it appropriate to accommodate the arrays with minimal wastage of space. Existing boundary planting has been retained, with the development kept away from these features to ensure their protection and to avoid areas where the existing vegetation could potentially cast a shadow onto the panels, which would reduce their efficiency, or create pressure for removal of vegetation in the future.
- 6.9 The supports for the arrays will be driven into the ground to depths of between 1-2 m. The arrays are set apart by approximately three times their overall height in order to avoid shadowing, giving open aisles of about 6–10 m in width between them, although the exact distance will depend on the topography of the site and will be designed to ensure optimum energy generation.

- 6.10 There will be a fence sited around the perimeter of the array to protect it from theft, vandalism or damage (see **Figure 10 for detail**). It is also necessary to protect any potential intruders from being harmed. The perimeter fencing will be a deer fence, up to 2.4 m in height, which is considered to be more sympathetic to the rural location. It will be erected on the inside of the boundary hedgerows and vegetation. The fence line will be set at least 8 m from any boundary hedges. CCTV cameras will be mounted on approximately 3 m tall poles at strategic locations.
- 6.11 The proposed PV panels and mounting frames will be approximately 2.4 m in height and sited in rows (see **Figure 9 for detail**). The panels will normally be set at a 25 degree angle with a minimum of 1 m above ground allowing light to penetrate and air to circulate so as to retain a healthy sward of grass beneath them. Due to a small area of flood risk in the north-western half of the site the panels here would be set slightly higher (approximately 1.4 m above ground level), to avoid potential water damage, creating a maximum panel height of 2.85 m. The flood risk area will also affect the location of the electrical equipment. The angled nature of the racks ensures the best solar absorption and the variation in the height will enable the scheme to allow for any ground undulations. The panels will be clustered together to minimize the ground footprint, but will be adequately spaced to avoid shadowing from panel to panel.
- 6.12 New native hedgerows and trees will be planted where necessary around the periphery of the development to visually screen the views into the panels. This proposed mitigation planting is shown on the Recommended Landscape Mitigation Plan in **Figure 12** and described below in **Section 8** of this report.

Access

- 6.13 It is proposed that the site will be accessed via the existing field access, which will be upgraded if required for construction purposes.
- 6.14 Virtually all of the vehicular activity on the site will be generated during the construction phase, at which point it is likely to generate circa 100 x 40 ft truck movements over a period of approximately three months. Following construction, minimal access will be required to the site, only for periodic maintenance and washing of the PV panels.
- 6.15 It is proposed to create a construction compound within the site which will be used for the storage of all plant and equipment and the provision of the necessary welfare facilities. Upon completion of development the area will be restored. Sufficient forward visibility can be achieved at the site access to satisfy highway requirements. It may, however, be necessary to remove a small area of hedgerow which, if required, will be fully re-instated upon completion of construction activities.
- 6.16 Once operational there will be minimal on-site activity. There will be regular (envisaged to be monthly) access to the array for maintenance works, usually carried out by a road-going van, such as a Ford Transit. Vehicular access will be via the existing field access which is located off Drove Lane, with the only internal roads being those providing access to the inverters. Access to the panels themselves will be available between the arrays.

- 6.17 It is therefore considered that the existing access provision is satisfactory and that the proposal will not create traffic or environmental problems or require any transport improvements which will harm the character of the locality. The proposal is therefore in conformity with policy.
- 6.18 During its operation the proposed development will, therefore, not result in any discernible increase in traffic on surrounding roads.

Layout - design iterations

- 6.19 The arrangement of the development has been revised several times since the project was initiated. These revision iterations have been made in response to the various impact assessments that have been carried out and to feedback from the local community and the local planning authority.

7.0 IMPACT ASSESSMENT

- 7.1 The landscape impact assessment has been carried out using the criteria set out in **Appendix A**. The following paragraphs include assessment of landscape impacts both during construction and operation of the proposed development.
- 7.2 The operational life of the development is expected to be 30 years, subject to planning condition, and so any direct visual or landscape impacts will be temporary and of medium term duration.

Perception of Solar Parks within the landscape

- 7.3 Large scale solar parks are very new features within the English landscape and so are currently unusual and could be viewed by some as being out of character (or too industrial) in a rural setting, but the English landscape has evolved over time to adopt and adapt to new beneficial infrastructure. Motorways, railways and electricity pylons were once alien elements but the nation benefits from them and they are now part of the English landscape. Solar parks are not entirely industrial in terms of character and bear some similarities with glass houses, vineyards and other crops grown in or under polythene. The latter examples are low elements in lines which follow the contours of the ground and are temporary. In terms of visual impact a solar park lies somewhere between crops grown under polythene and horticultural glass houses.
- 7.4 Solar parks are most prominent when viewed from the south where the glass face of the panels faces the observer and generally only if they occupy south facing slopes. Solar parks are far less visible when viewed at an angle or from the rear where they appear as a series of dull lines within the landscape of light and shadow. If the site is almost flat only the first row of panels is visible and can be readily be screened by managing the existing hedge structure to a winter height of around 2.5-3 m.

Landscape and Visual Impact during Construction

- 7.5 The construction phase of the proposed development is expected to last no more than four months and the construction process is simple, requiring a few operatives and machinery. All the elements will be factory assembled and will be lifted or craned into position. There will be some disturbance to the ground by machinery, but this should be minimal and will be made good following construction.

- 7.6 There will be no night time working and therefore no requirement for construction lighting.
- 7.7 As such landscape and visual impacts during construction will be **minor and adverse**. As the development is built out, the impacts will gradually reach those discussed below for the operational phase.

Landscape and Visual Impacts during Operation

Effect on topography and watercourses

- 7.8 There is no need to alter the levels on the application site. The array will be constructed to follow the existing contours of the land. The proposed PV frame foundations can be installed and removed without damaging the ground and so will not affect the topography of the application site. There will be no physical alteration to watercourses. Overall the impact on topography is considered to be negligible.

Effect on land use

- 7.9 Once operational, the application site can continue to be grazed and/or mown. Thus, while productivity will be reduced, the development does not preclude agricultural use.
- 7.10 It is anticipated that the soil structure may gradually improve over time since it would not be subject to intensive farming and the panels will be sufficiently spaced to avoid shading out of ground vegetation. The impact on land use is considered to be temporary, adverse of minor significance.

Effect on landscape features

- 7.11 No landscape features will be lost. The existing hedgerows and the woodland will be retained and managed to maintain their functional, aesthetic and wildlife value.
- 7.12 Hedgerow planting, tree planting and management of the hedgerows at a slightly taller winter height around the boundaries (see mitigation) will increase tree cover in the area which in terms of landscape features is considered **beneficial and of minor significance**.

Effect on landscape character

- 7.13 It is considered that the overall character of the application site, its immediate surroundings and that of the two areas of mountain slopes to the east, is of High sensitivity to change (refer to **Section 4** for detail).
- 7.14 All hedgerows, trees and field shapes and sizes will be retained intact and therefore the landscape character will not suffer any long term, permanent alteration. The minor beneficial impacts predicted under 'effect on landscape features' above will help permanently reinforce and enhance the character of the landscape in the long term.
- 7.15 The flat topography and high presence of gappy degraded hedgerows and tree belts, reduce the degree of change predicted, partly because the site is visible only in a small area. The magnitude of effects on landscape character will therefore be low.
- 7.16 The proposed development will temporarily (i.e. during the 30 year life of the PV development) result in an adverse, temporary and reversible impact on the character of the local landscape of **moderate/minor significance**.

Effect on the setting of Listed Buildings and Scheduled monuments

- 7.17 There are no Scheduled Monuments within 2 km of the site and therefore there is no effect.
- 7.18 Of the thirteen Grade II listed buildings that lie within 1 km of the site only Barnham Farm is visible from the site. Upon inspection the view from the edge of Barnham is highly restricted by hedgerows and thus it is predicted that there will be a negligible magnitude of change when seen from the property and an overall **negligible visual impact** to the setting of Barnham Farm. This the conservation area of Barnham has the same impact. This is displayed in photo 13 and 14 (See **Table 2 and Figure 11**)

Effect on the visual amenity of Public Rights of Way (PRoW)

- 7.19 Without mitigation there will be a **major adverse visual impacts** on the immediate PRoW network within 20 m of the site and a **moderate adverse impacts** on the PRoW network within 600 m of the site (to the north of the site where the landscape is open to existing views).
- 7.20 These effects are addressed in views 2, 3, 4, 7, 8, 9, 10, 11 and 14 in **Table 2** below. They describe how, after mitigation has established (between 5-7 years), there will be no adverse visual impacts and a **minor beneficial impact** predicted. PRoW improvements are also recommended to the surface of the PRoW adjacent to the southeast site boundary.
- 7.21 In order to address the impacts during hedgerow establishment it is also recommended that an interpretation board be placed on the public footpaths to the north and south of the site to inform the public of the solar park and the planned mitigation and landscape improvements, the temporary lifespan of the proposed development and the benefits of solar energy.

Assessment of views

- 7.22 The visual impact on views identified and assessed in **Table 2** using the criteria set out in **Appendix A**.

Table 2: Assessment of visual effect for public views

VIEW NO.	LOCATION	DESCRIPTION OF THE EXISTING VIEW	PREDICTED CHANGES TO THE VIEW AS A RESULT OF THE DEVELOPMENT	SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT (without mitigation)	MITIGATION	EFFECT ONCE MITIGATION IS EFFECTIVE
See Figure 11 for locations and photographs								
1	View facing southwest from Drove Lane Distance to site Boundary: 220 m Grid Ref: SU 96600 02709	The view looks out over agricultural land with a gravel access road. It has a very flat horizon and the view is limited by a tall hedgerow, which forms the site boundary and some woodland.	There will be little or no perceptible change. Where there are small gaps in the boundary vegetation some elements of the proposed development may be seen.	High Drove Lane is a designated PRow (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	Low There will be only very partial glimpses of the proposed development from this viewpoint.	Adverse and Moderate/Minor	Since the only views of the proposed development are through gaps in hedgerow boundaries the mitigation would require bridging these gaps with new native hedgerows and trees.	Beneficial and minor Once established (within 5-7 years) the views of the proposed development will be completely screened. Continuous hedgerows and native trees will add value to the landscape.
2	View facing west from PRow adjacent to the site Distance to site Boundary: 5 m Grid Ref: SU 96397 02367	The view looks out over agricultural land on a muddy track. It has a very flat horizon and the view is limited by a small woodland which is located on site.	The landscape will change dramatically with the fence and front of the PV panels fully visible and obstructing any other view.	High This is a designated PRow (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	Very High The proposed development will be seen at close range with no intervening features.	Adverse and Major	A new hedgerow will be planted along the southeast site boundary and grown to a managed height of 3 m. This will take between 5-7 years to reach full height. As part of this work the track will also be improved by incorporating a gravel track in the section between the footbridge and Drove Lane (530 m length)	Beneficial and minor Once established (within 5-7 years) the views of the proposed development will be screened. Continuous hedgerows and native trees will add value to the landscape. The improved footpath will also add visual and amenity value to the landscape. The site access will be the only remaining part of the site detectable. An interpretation board will be placed at this location to inform the public about the solar park and planting establishment.

VIEW NO.	LOCATION	DESCRIPTION OF THE EXISTING VIEW	PREDICTED CHANGES TO THE VIEW AS A RESULT OF THE DEVELOPMENT	SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT (without mitigation)	MITIGATION	EFFECT ONCE MITIGATION IS EFFECTIVE
3	View facing northwest from PRow Distance to site Boundary: 150m Grid Ref: SU 96378 01976	The view looks out over agricultural land with a grassy hedgerow, some trees, a small woodland and a slightly raised skyline in the far distance of the South Downs National Park, seen as a thin sliver.	The middle-distance ground will be changed from an agricultural field to a Solar PV site with striking, intrusive features in the landscape.	High This is a designated PRow (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	High The nearby hedgerows and trees reduce the view of the site so that only parts of the site are seen. The flat topography means that the proposed development will be seen to about half of the height of the existing trees on site and so will not affect long-distance views of the South Downs.	Adverse and Major/Moderate	A new hedgerow will be planted along the southeast site boundary and grown to a managed height of 3 m. This will take between 5-7 years to reach full height.	Negligible Once established (within 5-7 years) the views of the proposed development will be screened. Continuous hedgerows and native trees will add value to the landscape but will remove some middle-long distance views.
4	View facing north from PRow near footbridge Distance to site Boundary: 20 m Grid Ref: SU 96181 01933	The view looks out over gappy agricultural hedgerows with woodland in the background. The view is limited in distance due to the flat topography and tall trees.	There will be near-distance visible portions of the PV panels and fences through gaps in the hedgerow. The fence will be close to the height of the existing hedgerow in the centre of the photograph.	High This is a designated PRow (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	Medium There will be partial, close-range views of field 01 of the proposed development from this viewpoint.	Adverse and Moderate	Since the only views of the proposed development are through gaps in hedgerow boundaries the mitigation would require bridging these gaps with new native hedgerows and trees.	Beneficial and minor Once established (within 5-7 years) the views of the proposed development will be screened. Continuous hedgerows and native trees will add value to the landscape.

VIEW NO.	LOCATION	DESCRIPTION OF THE EXISTING VIEW	PREDICTED CHANGES TO THE VIEW AS A RESULT OF THE DEVELOPMENT	SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT (without mitigation)	MITIGATION	EFFECT ONCE MITIGATION IS EFFECTIVE
5	View facing southwest from PRow Distance to site Boundary: 480 m SU 96890 02752	The view looks out over open agricultural land. It has a very flat horizon dominated by low woodland blocks. A farmhouse is seen to the west.	There will be little or no perceptible change. Where there are small gaps, or low points in the boundary vegetation the tips of some taller elements of the proposed development may be seen.	High This is a designated PRow (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	Negligible There will be only very partial glimpses of the proposed development at a distance that is barely perceptible such a flat landscape.	Adverse and Minor Only the very tips or small portions of the proposed development will be seen at medium distance.	Since the only views of the proposed development are through gaps or over the tops of hedgerow boundaries the mitigation would require bridging these gaps with new native hedgerows and trees.	Beneficial and minor. Once established (within 5-7 years) the views of the proposed development will be completely screened. Continuous hedgerows with native trees will add visual value to the landscape.
6	View facing southwest from PRow near Yapton (next to housing and PRow) Distance to site Boundary: 1.2 km SU 97506 03134	The view looks out over open agricultural land. It has a very flat horizon dominated by low woodland blocks. A farmhouse is seen surrounded by hedgerows.	There will no perceptible change as there are multiple layers of trees and hedgerows between the site and the viewpoint effectively screening the proposed development.	High This is a designated PRow next to listed buildings and dwellings (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	None	NA	NA	NA

VIEW NO.	LOCATION	DESCRIPTION OF THE EXISTING VIEW	PREDICTED CHANGES TO THE VIEW AS A RESULT OF THE DEVELOPMENT	SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT (without mitigation)	MITIGATION	EFFECT ONCE MITIGATION IS EFFECTIVE
7	View facing southeast from PRow junction near Barnham Distance to site Boundary: 670 m Grid Ref: SU 95781 03423	The view looks out over agricultural land with post and wire fences and a background of woodland on a flat horizon.	Field 3 and a very small part of field 1 is seen as a very narrow sliver. These parts of the view will change where fences and the rear of PV panels will be seen. Boundary hedgerows and other clusters of scrub and trees in between the viewpoint and the site screen some of the proposed development, so only a portion of the site is seen.	High This is a well-used PRow (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	Medium There will be only very partial views of the rear of the of the proposed development edge from this viewpoint.	Adverse and Moderate/	New hedgerows will be planted along the north and west boundaries of the site. Native trees are planted in clusters to break up the long hedgerow line and offer more instant height.	Beneficial and minor Once established (within 5-7 years) the views of the proposed development will be completely screened. Continuous hedgerows and native trees will add value to the landscape.
8	View facing southwest from PRow Distance to site Boundary: 185 m Grid Ref: SU 96098 02915	The view looks out over agricultural land with drainage ditches delineated by tall grasses. It has a very flat horizon and the view is limited by a tall gappy hedgerow, which forms the site boundary. The PRow is a gravel track, which passes some horse paddocks.	There will be fences and the rear of PV panels visible, but seen through the hedgerow gaps and so will be more visible in winter.	High This is a well-used PRow (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	Medium There will be close-range, but very partial glimpses of the proposed development, through hedgerow gaps from this viewpoint.	Adverse and Moderate	Since the only views of the proposed development are through gaps in hedgerow boundaries the mitigation would require bridging these gaps with new native hedgerows and trees.	Beneficial and minor Once established (within 5-7 years) the views of the proposed development will be completely screened. Continuous hedgerows and native trees will add value to the landscape.

VIEW NO.	LOCATION	DESCRIPTION OF THE EXISTING VIEW	PREDICTED CHANGES TO THE VIEW AS A RESULT OF THE DEVELOPMENT	SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT (without mitigation)	MITIGATION	EFFECT ONCE MITIGATION IS EFFECTIVE
9	View facing south from PRow adjacent to drainage ditch Distance to site Boundary: 10 m Grid Ref: SU 95963 02799	The view looks out over agricultural land with drainage ditches delineated by tall grasses. It has a very flat horizon and the view is limited by a tall hedgerow and woodland backdrop. An old stone farm building is seen in the centre of the site.	The landscape will change dramatically with the fence and rear of the PV panels fully visible and obstructing any other view.	High This is a well-used PRow (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	Very High Field 03 of the proposed development will be seen at close range with no intervening features.	Adverse and Major	A new native hedgerow will be planted along the northwest site boundary and grown to a managed height of 3 m. This will take between 5-7 years to reach full height. Clusters of trees will also be planted to add more instant height and break up the long visual line of the hedgerow.	Beneficial and minor Once established (within 5-7 years) the views of the proposed development will be screened. Continuous hedgerows with native trees will add visual value to the landscape An interpretation board will be placed at this location to inform the public about the solar park and planting establishment.
10	View facing east from PRow Distance to site Boundary: 20 m Grid Ref: SU 95609 02491	The view looks out over agricultural land with drainage ditches delineated by tall grasses. It has a very flat horizon and the view is limited by a tall hedgerow and woodland.	The landscape will change dramatically with the fence and side-on PV panels fully visible.	High This is a well-used PRow (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	High Field 03 of the proposed development will be seen at close range with no intervening features.	Adverse and Major	A new native hedgerow will be planted along the west and southwest site boundaries and grown to a managed height of 3 m. This will take between 5-7 years to reach full height. Clusters of trees will also be planted to add more instant height and break up the long visual line of the hedgerow.	Beneficial and minor Once established (within 5-7 years) the views of the proposed development will be screened. Continuous hedgerows with native trees will add visual value to the landscape

VIEW NO.	LOCATION	DESCRIPTION OF THE EXISTING VIEW	PREDICTED CHANGES TO THE VIEW AS A RESULT OF THE DEVELOPMENT	SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT (without mitigation)	MITIGATION	EFFECT ONCE MITIGATION IS EFFECTIVE
11	View facing east from PRoW footbridge (across drainage ditch) Distance to site Boundary: 135 m Grid Ref: SU 95516 02411	The view looks out over agricultural land with drainage ditches delineated by tall grasses. It has a very flat horizon and the view is limited by a tall hedgerow and woodland.	A narrow strip of proposed development will be seen – fence panels and the side-on PV panels. The proposed development will be no taller than approximately twice the height of the earth mounds seen on site.	High This is a well-used PRoW (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	Medium Field 03 of the proposed development will be seen at medium distance and as a very narrow strip in the landscape. As the view is taken from the elevated footbridge the views further southeast are screened by both the bridge and surrounding vegetation.	Adverse and Moderate	A new native hedgerow will be planted along the southwest site boundary and grown to a managed height of 3 m. This will take between 5-7 years to reach full height. Clusters of trees will also be planted to add more instant height and break up the long visual line of the hedgerow.	Beneficial and minor Once established (within 5-7 years) the views of the proposed development will be completely screened. Continuous hedgerows with native trees will add visual value to the landscape
12	View facing northeast from PRoW Distance to site Boundary: 650 m Grid Ref: SU 95424 01777	The view looks out through a gap in the hedgerow that bounds the PRoW, looking over agricultural land with hedgerows, tree clusters, woodland, electricity pylons and a narrow horizon view of the South Downs National Park.	There will be small glimpses of perceptible change in which the fence panels and tips of the front of PV panels will be seen from middle distance. There will be more of the site seen in winter when hedgerows have less foliage.	High This is a well-used PRoW (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	Low There will be only very partial glimpses of the proposed development from this viewpoint. The viewpoint also represents a small gap in the hedgerow that bounds the PRoW.	Adverse and Moderate/ Minor	Since the only views of the proposed development are through gaps in hedgerow boundaries the mitigation would require bridging these gaps with new native hedgerows and trees.	Negligible. Once established (within 5-7 years) the views of the proposed development will be screened. The tips of some PV panels near the existing building on-Site may be visible, but barely perceptible.

VIEW NO.	LOCATION	DESCRIPTION OF THE EXISTING VIEW	PREDICTED CHANGES TO THE VIEW AS A RESULT OF THE DEVELOPMENT	SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT (without mitigation)	MITIGATION	EFFECT ONCE MITIGATION IS EFFECTIVE
13	View facing south from a PRoW near Barnham Court Distance to site Boundary: 840 m Grid Ref: SU 95462 03434	The view looks out over agricultural land through a gap in a hedgerow next to some horse paddocks. It has a very flat horizon and the view is limited by woodland.	There will be very small perceptible changes where small portions of the site are visible in gaps between hedgerows. Where there are small gaps the proposed fence and rear of the PV panels will be visible at long-distance.	High This is a designated PRoW (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	Low There will be only very partial glimpses of the proposed development from this viewpoint.	Adverse and Moderate/Minor	A new native hedgerow will be planted along the northwest site boundary and grown to a managed height of 3 m. This will take between 5-7 years to reach full height. Clusters of trees will also be planted to add more instant height and break up the long visual line of the hedgerow.	Negligible Once established (within 5-7 years) the views of the proposed development will be screened.
14	View facing south from a PRoW near Barnham Court Farm Distance to site Boundary: 680 m Grid Ref: SU 95622 03392	The view looks out over agricultural land through a gap in a hedgerow next to some horse paddocks. It has a very flat horizon and the view is limited by woodland. There are less features in this view between the site and the viewpoint.	There will be very small perceptible changes in narrow portions of the view where proposed fence and rear of the PV panels will be visible at middle-distance.	High This is a designated PRoW (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	Medium There will be only very partial views of the rear of the of the proposed development edge from this viewpoint.	Adverse and Moderate	A new native hedgerow will be planted along the northwest site boundary and grown to a managed height of 3 m. This will take between 5-7 years to reach full height. Clusters of trees will also be planted to add more instant height and break up the long visual line of the hedgerow.	Beneficial and minor Once established (within 5-7 years) the views of the proposed development will be completely screened. Continuous hedgerows and native trees will add value to the landscape.

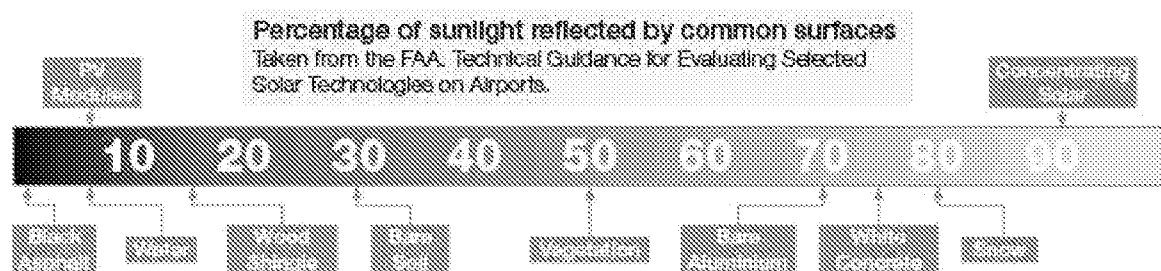
VIEW NO.	LOCATION	DESCRIPTION OF THE EXISTING VIEW	PREDICTED CHANGES TO THE VIEW AS A RESULT OF THE DEVELOPMENT	SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT (without mitigation)	MITIGATION	EFFECT ONCE MITIGATION IS EFFECTIVE
15	View facing west from the end of a PRow near Old Bilsham Farm and listed buildings Distance to site Boundary: 450 m Grid Ref: SU 96753 02126	The view looks out over flat agricultural land. It has a very flat horizon and the view is limited by woodland.	There will be little or no perceptible change.	High This is a designated PRow (and thus has a high value) with little or no intrusive elements (and therefore has a high susceptibility to change).	None	NA	NA	NA
16	View facing south from a PRow within the South Downs N.P. Distance to site Boundary: 6.2 km Grid Ref: SU 94123 08696	The view looks out over a wide panoramic view of Chichester and Arun districts extending all the way to the English Channel. A large amount of the view is occupied by woodland. Some large buildings and infrastructure is seen as small narrow strips in the far distance.	There will be little or no perceptible change at this distance and with the presence of intervening woodland and hedgerows.	High This is a designated PRow within a national park (and thus has a high value) with a panoramic view (and therefore has a medium susceptibility to change).	None	NA	NA	NA

Summary of visual impact

- 7.23 Overall the site is well screened by the surrounding hedgerows, woodland set within the flat topography. However, due to the close-proximity of two public footpaths the proposed development will initially result in some **major adverse impacts** on these receptors. This affects approximately 600 m of footpath to the north of the site and 500 m of footpath to the south of the site. There are no dwellings with significant views of the site.
- 7.24 The visual impacts can be mitigated through the planting of hedgerows and tree belts. The strength of the visual impacts requires significant mitigation to make the scheme acceptable – which is why both a hedgerow and tree belt is proposed along the northern site boundaries. The mitigation measures, once established (approximately 5-7 years) will form a solid visual screen in summer and is sufficiently deep that it will form an effective screen when out of leaf.
- 7.25 The additional enhancements include footpath improvements to the muddy track to the southeast of the site and of placing interpretation boards on the public footpaths to the southeast and northwest of the site. These are a 'belt-and-braces' approach to improving public perception of the proposed development whilst the planting becomes established and some of the proposed development is partially visible.

Glare

- 7.26 PV panels absorb sunlight and the glass is coated with translucent coating materials to improve light transmittance into the glass. Thus panels appear to have a dull sheen and do not reflect light as strong glint or glare. Studies into the likely impacts from glare on aviation have shown that glare from a photovoltaic installation is less than that from a similar sized water body, such as a lake.



- 7.27 Glint is a more intense, but intermittent direct reflection of the sun from reflective surfaces, which can occur on rare occasions when several environmental conditions coincide. The sun has to be at the right height in the sky (seasonal) and at the right angle (time of day) and there must be no cloud obscuring the sun. Assuming that there is no cloud cover, these circumstances would only result in glint impacts on each receptor for a short period of time each day and for a few days twice a year. With the added constraint of cloudy weather, and other variables such as the slight differences in the pitch of panels and undulations in topography, it is almost impossible to predict these impacts. However, the PV panels and the frames are all designed with non-reflective surfaces and so any glint impacts would be minimal.

- 7.28 There are several sensitive receptors within 2 km south of the site, including PRowS and residential properties. No dwellings to the south have a view of the proposed development. Intervening hedgerows and trees break up most views from public footpaths to the south of the site. Any remaining views, before mitigation are partial and of minor/moderate visual significance. Overall the potential adverse effect from glint is considered to be temporary and of negligible significance. The proposed mitigation planting is considered to be suitable mitigation in respect of further minimising the risk of any potential glint or glare impacts. As such no additional glare-specific mitigation measures have been designed into the proposed development.

8.0 MITIGATION MEASURES

- 8.1 Mitigation measures have been described in the assessment tables and can be summarised thus:

Primary mitigation measures

- 8.2 These are measures that intrinsically comprise part of the development through design iterations and include:

- A new hedgerow and tree belt planted along the southwest, northwest and north site boundary. This will include a 1.2 m thick hedgerow and a 4.5 m wide area of tree belt planting (approximately 3 trees in depth). Trees will provide a more instant, higher level, partial screening. Full establishment is expected between 5-7 years when the hedgerow will be managed at a height of 3m. This will also fill gaps in the northeast boundary hedgerow;
- A new 1.2 m thick boundary hedgerow along the southeast site boundary, set back 3 m from the line of the PRow. Full establishment is expected between 5-7 years when the hedgerow will be managed at a height of 3 m;
- Two interpretation boards – one on the PRow north of the site and one on the PRow south of the site. These will inform the public of the solar park and the planned mitigation and landscape improvements, temporary lifespan of the proposed development and the benefits of solar energy.
- Surface improvements to the surfacing of the footpath to the south of the site. This will incorporate a 1.8 m wide gravel path for 600 m of the footpath between Drove Lane and the footbridge, south of the site.
- Grassland improvements of wildflower planting throughout the site to improve the long-term ecological biodiversity of the site and long-term soil structure. Grazing sheep may be used to control the grass and add nutrients to the soil.

- 8.3 **Figure 12** identifies recommended landscape mitigation.

Summary of visual impact once mitigation has established

- 8.4 During the initial 5 years the planting will need time to grow in height and establish. During this time the visual impact of the development will gradually reduce. Tree planting on the north, east and west boundaries will speed up the mitigation screening effects. It is predicted that between 5-7 years from planting the hedgerows will reach a height of approximately 3 m and will screen the site from all viewpoints. The trees and hedgerows will then have a minor beneficial effect on visual amenity by repairing gappy hedgerows and intruding a more solid woodland infrastructure to the edges of the site.

- 8.5 From a public footpath user's perspective the site will not be perceptible, except from where the site access is located, in the centre of the south-eastern site boundary. This is where one of the interpretation boards should be placed, in order to keep the public informed.

9.0 COMPLIANCE WITH PLANNING POLICIES

- 9.1 Since solar parks are a relatively new form of development within the UK, there are no specific local planning policies in the adopted Plan which relates directly to them. In terms of landscape and visual issues the development proposal is considered to be compliant with the currently relevant policies.

10.0 CUMULATIVE IMPACT

- 10.1 A second solar park is proposed on similar arable land 2.5 km to the east. The two sites are not inter-visible due to the intervening railway corridor and woodland. Although both sites are potentially visible from the South Downs National Park, there is no discernible magnitude of change felt at that distance. The cumulative effect to users will be **negligible** due to the distance and aspect making the solar parks barely distinguishable within the surrounding landscape.

11.0 CONCLUSION

- 11.1 Without mitigation the proposed development will have a major adverse effect on the visual amenity of users for a short section of a well-used PRow along the north western boundary. Hedge and tree planting is proposed which will screen the solar park from this section of PRow. Once the mitigation is effective the proposed development is predicted to have no significant adverse landscape and visual effects. In addition, the proposed development is temporary and will be constructed in such a way that it will not have any adverse impact on the landscape once it is removed.

APPENDIX A

Assessment Methodology

APPENDIX A: Assessment Methodology

Assessing the Nature of Landscape Receptors (Sensitivity to Change)

- A1.1 Assessment of landscape sensitivity is concerned with the relative value that is attached to different landscapes. Sensitivity refers to the degree to which a particular landscape feature or character area is able to accommodate change without significant effects on its components or overall character, and susceptibility.
- A1.2 In a policy context the usual basis for recognising certain highly valued landscapes is via application of local or national landscape designations. A landscape can nonetheless be valued by different communities for many different reasons without any formal designation.
- A1.3 The assessment of landscape quality (condition) is based on judgements about the physical state of the landscape and about its intactness from visual, functional and ecological perspectives. It also reflects the state of repair of individual features and elements that make up the character in any one place.
- A1.4 It usually follows that higher quality landscapes have higher sensitivity to change, but this must also be assessed in conjunction with landscape value to give an overall assessment of sensitivity.
- A1.5 This study assigns a degree of sensitivity to landscape features and to each landscape character area identified (Table A.1 refers).

Table A.1: Landscape Quality/Sensitivity

LANDSCAPE SENSITIVITY	DEFINITION	TABLE A5 DEFINITION
Very high/ International	Landscape of exceptional scenic quality, harmonious and unified with pleasing landscape patterns and combinations of landscape features. Demonstrates strong landscape structure, characteristics, patterns, balanced combination of landform and land cover, distinct features, and land under appropriate management. Has no or very few detracting features and is typically considered very attractive by most people. These landscapes are highly valued and often designated of international importance such as World Heritage sites. They are extremely susceptible to small changes.	Very High
High/ National	Landscape of exceptional scenic quality, harmonious and unified with pleasing landscape patterns and combinations of landscape features. Landscape containing many attractive features and no visually intrusive or incongruous features. Vegetation in good condition and where appropriate, well maintained. Typically considered very attractive by most people. Designated landscapes of international or national importance. Qualities typically found within Areas of Outstanding Natural Beauty and National Parks.	High
Medium/ Regional	An attractive landscape but with some minor blemishes, such as unattractive buildings. Vegetation generally in good condition and well maintained. Designated landscapes of regional, county or district importance. A quality typically exhibited by Areas of Great landscape Value.	Medium
High/Local	A reasonably attractive landscape with a mix of attractive features but only a few intrusive elements. Vegetation condition varies in quality. Typical of many landscapes throughout Britain	
Medium/ Local	A pleasant but ordinary landscape with numerous blemishes, such as industrial areas and pylons. Vegetation structure and management poor. Typically an urban fringe landscape.	Low
Low/Local	A degraded or disturbed landscape with a severely damaged landscape structure, for example many hedges removed. Many unattractive and intrusive features. Typical of urban fringe landscapes in need of restoration	Negligible

Assessing the magnitude of change to landscape features

- A1.6 The magnitude of the change to existing landscape character and features is assessed in accordance with the criteria set out in Table A.2. These criteria can be applied to both positive and negative impacts.

Table A.2: Magnitude of change to the Landscape

LANDSCAPE IMPACT MAGNITUDE	DEFINITION
Very high	The proposed development will either cause a large improvement or complete loss of or major alteration to key elements/features/characteristics. Or introduction of elements considered entirely characteristic or totally uncharacteristic.
High (dominant)	The proposed development will cause either a significant improvement or deterioration of one or more key elements/features/characteristics or introduction of elements that may be considered to be substantially uncharacteristic or characteristic.
Medium (prominent)	The proposed development will cause a noticeable improvement or deterioration of/minor loss to one or more key elements/features/characteristics or the introduction of elements that are uncharacteristic or characteristic.
Low (present)	The proposed development will cause a barely perceptible improvement or deterioration to one or more key elements/features/characteristics, or introduction of elements that are characteristic or uncharacteristic.
Negligible/No Change	The proposals will cause no actual change or no discernible change.

Analysis of Visual Receptors

Assessing the Sensitivity of Visual Receptors to Change

- A1.7 The sensitivity of visual receptors depends on its location and context, the expectations and occupation or activity of the viewer and on the importance of the view (the latter is derived from the receptors popularity or frequency of use)
- A1.8 The purpose of describing the baseline visual environment is to identify the most important sensitive visual receptors around the site which have views to or across the proposed development. A visual receptor is essentially any viewer who would be likely to be affected as a result of the proposed development. The sensitivity of any receptor is categorised in Table A.3 below.

Table A.3: Visual Receptor Sensitivity

VISUAL RECEPTOR SENSITIVITY	INDICATIVE DEFINITION
Very high	Views from within internationally and nationally designated high quality landscapes (National Parks, AONB), scheduled monuments or Grade 1 listed buildings and their setting, where views from, or near to public rights of way/public roads (where the attractive nature of the environment is a significant factor in the enjoyment of the visit typically National Trails and Long Distant Footpaths.). Views from large numbers of residential properties in the same location (typically 100+)
High	Views from within high or medium high quality regionally designated landscapes (Areas of Great Landscape Value), parks or gardens listed in the National Gardens Register, Grade II* and II listed buildings and their settings. Views from well used public rights of way (where the attractive nature of the countryside is a significant factor in the enjoyment of the walk). Views from a numerous residential properties within a similar location (typically between 10-100)
Medium	Views from within medium quality non-designated but locally important landscapes, outdoor sports or recreation (where the landscape is not a factor in the enjoyment of the sport). Views from public rights of way used locally and passing through attractive rural landscapes. Views from or near to residential properties, from passenger trains, or people within cars on local roads. Views from single or small groups of residential properties (less than ten)
Low	Views from within medium-low non-designated but locally important landscapes. Views from less well used public rights of way which pass through less attractive landscapes or townscape and are not used for enjoyment of the scenery. Views from or near to motorways, major roads, or business premises.
Negligible	Views from within unattractive non-designated landscapes of local importance.

Assessing the Magnitude of Visual Change

- A1.9 The magnitude of change to the current (baseline) visual environment depends on a combination of factors, such as the size of change, the nature of change and the ability of the viewer to appreciate the change. Table A.4 provides definitions for the magnitude of both positive and negative impacts.

Table A.4: Magnitude of Visual Change

VISUAL IMPACT MAGNITUDE	DEFINITION
Very high	The proposed development will either cause complete loss of the view or a very large improvement in the view.
High (dominant)	The proposed development will either be visually dominant and intrusive and will disrupt views or will result in a significant improvement or deterioration of the view.
Medium (prominent)	The proposed development will be visually prominent within the view and will result in either a noticeable improvement or deterioration of the view.
Low (present)	The proposed development will either cause barely adverse or barely positive change within the view.
Negligible/No Change	The proposed development will cause no actual change or no discernible change within the view.

Assessment of Significance

A1.10 The significance of impacts is assessed using the appropriate national and international quality standards and professional judgement. For clarity and transparency, criteria have been used to attribute levels of significance. Broadly, the significance is a function of the magnitude of the impact and the number and sensitivity of receptors. The reversibility and duration of the effect are also important considerations.

A1.11 For each assessment factor the sensitivity of the effect is combined with magnitude to give an overall score for the significance of the impact as set out in Table A.5

Table A.5: Table used to determine the significance of either landscape or visual effects

SENSITIVITY OF RECEPTOR FEATURES						
MAGNITUDE OF EFFECT		Very High	High	Medium	Low	Negligible
	Very High	Major	Major	Major/ Moderate	Moderate	Minor
	High	Major	Major/ Moderate	Moderate	Moderate/ Minor	Minor
	Medium	Major/ Moderate	Moderate	Moderate	Minor	Minor/ Negligible
	Low	Moderate	Moderate/ Minor	Minor	Minor/ Negligible	Negligible
	Negligible	Minor	Minor	Minor/ Negligible	Negligible	Negligible