Springwell Solar Farm

Preliminary Environmental Information Report

Volume 1
Chapter 14: Glint and Glare

Phase 2 consultation
Springwell Energyfarm Ltd

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14. Glint and Glare

14.1. Introduction

14.1.1. This chapter presents the preliminary environmental information and a preliminary assessment of the effects of glint and glare during operation of the Proposed Development. Whilst solar panels are specifically designed to absorb, not reflect, irradiation solar panels may reflect the sun's rays at certain angles, causing glint and glare. Glint is defined as a momentary flash of light that may be produced as a direct reflection of the sun in the solar panel. Glare is a continuous source of excessive brightness experienced by a stationary observer located in the path of reflected sunlight from the face of the panel.

14.1.2. Whilst glint and glare could be triggered as the panels are installed during construction, the likely worst case of any glint and glare impacts would be once the whole solar farm is constructed (i.e. operational). For this reason, this assessment focuses on the operation of the Proposed Development.

14.1.3. This chapter is intended to be read as part of the wider Preliminary Environmental Information Report (PEIR), with particular reference to **Appendix 4.1 - 4.3** presented in **Volume 3**.

14.2. Consultation and study area

Consultation undertaken to date

14.2.1. An Environmental Impact Assessment (EIA) Scoping Report, presented in **Appendix 4.1**, setting out the proposed approach to glint and glare was submitted to the Planning Inspectorate in March 2023. A Scoping Opinion, presented in **Appendix 4.2**, was issued by the Planning Inspectorate on behalf of the Secretary of State in May 2023. The Planning Inspectorate agreed with the approach to scope out a glint and glare ES factor chapter and to instead prepare a detailed glint and glare stand-alone report; however, it has been requested that the report is included as a technical appendix to the ES that assesses the worst case scenario and, where glint and glare effects are identified, is used to inform the relevant chapters in the ES.

14.2.2. **Appendix 4.3** provides responses to comments relating to glint and glare in the Scoping Opinion and details how these have been addressed in this preliminary assessment.

14.2.3. Outside of the EIA Scoping process, the Applicant will be agreeing with relevant stakeholders the proposed study area and receptors that will inform the glint and glare assessment that will be appended to the ES. No specific consultation has been undertaken to inform this preliminary assessment.

Study area

14.2.4. There is no formal guidance with regard to the maximum distance at which glint and glare should be assessed. However, based on industry best practice and past assessment experience, the following study areas are considered appropriate:

- 1km for ground-based receptors including residential dwellings and national and regional roads (A15, B1191 and B1188). This is due to that in majority of cases, the possibility of a solar farm being visible to a resident or road user will diminish with distance, with terrain and shielding by vegetation which is likely to obstruct the observers' view.
- 15km study area for aviation receptors. The approach for determining the receptor locations on the approach path is undertaken by selecting locations along the runway centre line from 50ft above the runway threshold out to a distance of 2 miles. The approach phase (arrival flight paths) is considered in the estimation of impact as this is deemed to be the most sensitive phase of a flight. Departing aircraft will have the nose pointing upwards and the visibility of objects (i.e. reflective panels) located on the ground will be reduced and therefore this has not been considered.
- 500m from the Site boundary to railway signal and train driver receptors.

14.3. Legislative framework, planning policy and guidance

14.3.1. There is no formal legislation relating to glint and glare.

14.3.2. Planning policy relevant to glint and glare is summarised below:

- Overarching National Policy Statement for Energy (NPS EN-1) (2011)[1] provides the basis for decisions regarding nationally significant energy infrastructure. Sections 5.4 and 5.9 are related to the planning policy for glint and glare, including civil and military aerodromes and landscape and visual.

[1] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure

- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[2] – Sections 3.10.93-97, 3.10.125-127 and 3.10.149-150 give specific consideration to glint and glare and sets out the relevant planning policy and decision making framework. Section 3.10.150 gives particular reference to aviation and glint and glare stating that '*whilst there is some evidence that glint and glare from solar farms can be experienced by pilots and air traffic controllers in certain conditions, there is no evidence that glint and glare from solar farms results in significant impairment on aircraft safety. Therefore, unless a significant impairment can be demonstrated, the Secretary of State is unlikely to give any more than limited weight to claims of aviation interference because of glint and glare from solar farms'.*
- Planning Practice Guidance for Renewable and Low Carbon Energy - Paragraph 013 sets out guidance for ground mounted solar farms and details particular factors a local planning authority will need to consider and gives reference to the need to consider landscape and visual impact, and the effect on landscape of glint and glare on neighbouring uses and aircraft safety.

14.3.3. Guidelines exist in the UK (produced by the Civil Aviation Authority) and in the USA (produced by the Federal Aviation Administration) with respect to solar developments and aviation activity. However, the UK CAA guidance is relatively high-level and does not prescribe a formal methodology[3].

14.3.4. In the absence of any formal guidance, the full assessment will be carried out in accordance with industry best practice and 4th edition of the solar photovoltaic and building development glint and glare guidance[4] issued by Pager Power in September 2022.

14.4. Sensitive receptors

14.4.1. The Proposed Development has the potential for glint and glare effects on the following receptors:

- Road users within 1km of the Site boundary of the Proposed Development;

[2] Draft National Policy Statement for Renewable Energy (EN-3) (2023). Available online: https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements

[3] Civil Aviation Authority. Interim Guidance – Solar Photovoltaic Systems (2010). Available online: 2010/53 Info Alert: Interim CAA Guidance – Solar Photovoltaic Systems

[4] Pager Power. Solar Photovoltaic and Building Development – Glint and Glare Guidance. Fourth Edition (2022). Available online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)

- Three roads have been identified, including A15, B1191 and B1188 which have the potential for glint and glare impacts.
- All roads within 1km of the Site boundary have been reviewed; however, further technical modelling has not been undertaken to consider local roads as is not recommended where traffic densities are likely to be relatively low. Any solar reflections from the Proposed Development that are experienced by a road user along a local road would be considered low impact in the worst case, in accordance with the Pager Power guidance[5].

- Occupants of residential dwellings within 1km of the Site boundary of the Proposed Development;
  - 189 residential dwelling receptor points have been identified.
- Aviation receptors within 15km of the Site;
  - RAF Cranwell;
  - Griffin's Farm Airstrip;
  - Cottage Farm Airstrip;
  - Old Manor Farm Airstrip;
  - Hanbeck Farm Airstrip;
  - RAF Waddington;
  - Millfield Farm Airstrip;
  - RAF Coningsby; and
  - RAF Barkston Heath.
- 500m from Railway operations and infrastructure.
  - Six railway signal receptors have been identified.
  - Receptor points along the assessed section of railway line have been identified, based on a train driver's eye level typically 2.75m above rail level as informed by previous consultation with Network Rail.
- Pedestrians/observers along public rights of way (PRoW).

14.4.2. Pedestrians/observers along PRoW have not been assessed in this preliminary assessment as no significant effects are predicted and therefore, the full modelling has not been completed. Pedestrian/observers along PRoW will be included within the assessment detailed within the Environmental Statement. Based on professional experience, pedestrians/observers along PRoW are low-sensitivity receptors. This is due to the following reasons:

- The typical density of pedestrians on a PRoW is low in a rural environment;

[5] Pager Power. Solar Photovoltaic and Building Development – Glint and Glare Guidance. Fourth Edition (2022). Available online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Fourth-Edition.pdf (pagerpower.com)

- Any resultant effect is much less serious and has far lesser consequences than, for example, solar reflections experienced towards a road network, whereby the resultant impacts of solar reflect can be serious to safety;
- Glint and glare effects towards receptors on a PRoW are transient and time and location sensitive, where a pedestrian could move beyond the solar reflection zone with ease and little impact upon safety or amenity; and
- There is no safety hazard associated with reflections towards an observer on a footpath.

14.4.3. Furthermore, it is determined that any likely effect will have a low magnitude due to the following reasons:

- It is likely that the existing and the proposed screening is predicted to fully remove the visibility of the Proposed Development for PRoW users; and
- The reflection intensity is similar for solar panels and still water (and significantly less than reflections from glass and steel) which is frequently a feature of the outdoor environment surrounding PRoW. Therefore, the reflections are likely to be comparable to those from common outdoor sources whilst navigating the natural and built environment on a regular basis.

14.5. Methodology

Design assumptions

14.5.1. **Chapter 2: Description of the Proposed Development** details the preliminary design principles of the Proposed Development components as they are currently known. Preliminary parameter plans, which define the broad extents within which development can take place, are presented in **Figure 2-3**.

14.5.2. The preliminary glint and glare assessment has been undertaken based on the maximum extent of solar development as presented in **Figure 2-3** to ensure a likely worst case scenario is assessed.

Assessment methodology

14.5.3. The methodology for the glint and glare assessment has been developed based on industry best practice, available guidance and professional experience. It comprises the following stages and will be assessed utilising the Pager Power guidance[6]:

[6] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)

- Identification of key sensitive receptors outlined above that may have potential impacts within and in the surrounding environment of the Proposed Development in accordance with the study areas for each receptor type.
- Use of modelling and geometric reflection calculations considering the direct solar reflections towards the key receptors.
- Consideration of existing vegetation and visibility of the panels from the receptor.
- Determination of the significance of impact for each receptor as outlined below in further detail. Where a solar reflection is predicted, consideration is given to the mitigation (screening) between the receptor and the reflecting solar panels.
- For aviation activity, where a solar reflection is predicted, solar intensity calculations are undertaken where appropriate in line with the Sandia National Laboratories' FAA methodology[7]. The scenario in which a solar reflection can occur for all receptors is then identified and discussed, and a comparison is made against the available solar panel reflection studies to determine the overall impact.

Residential dwelling receptors

14.5.4. A solar panel produces a solar reflection and therefore the light reflected is less intense than direct sunlight because a percentage of the light is absorbed by the solar panel. Shadow flicker is the effect of the varying light levels directly from the Sun;

14.5.5. The presence of shadow flicker would be a new effect experienced at a dwelling. Solar panels produce solar reflections of similar intensity to those from still water or glass for example, both common reflective sources next to dwellings.

14.5.6. Shadow flicker guidance[8] states that effects for more than 30 minutes per day, over 30 hours of the year, is significant and requires mitigation. Considering the information presented within the Pager Power Guidance[9] and the above, it is deemed appropriate to consider the effects of glint and glare less significant than shadow

[7] Ho, Clifford, Cheryl Ghanbari, and Richard Diver. 2009. Hazard Analysis of Glint and Glare From Concentrating Solar Power Plants. SolarPACES 2009, Berlin Germany. Sandia National Laboratories.
[8] Draft PPS18: Renewable Energy Annex 1 Wind Energy Planning Issues: Shadow Flicker and Reflected Light, Planning Portal Northern Ireland (the shadow flicker recommendations are based on research by Predac, a European Union sponsored organisation promoting best practice in energy use and supply which draws on experience from Belgium, Denmark, France, the Netherlands and Germany). Available Online: Best Practice Guidance to PPS 18 'Renewable Energy' | Department for Infrastructure (infrastructure-ni.gov.uk)
[9] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Fourth-Edition.pdf (pagerpower.com)

flicker. Therefore, the duration beyond which mitigation should be required for glint and glare is longer than for shadow flicker.

14.5.7. Therefore, as recommended in the Pager Power Guidance[10], if visible glint and glare is predicted for a surrounding dwelling for longer than 60 minutes per day, for three or more months of the year, then the impact should be considered significant with respect to residential amenity. In this scenario, mitigation should be implemented.

14.5.8. For residential dwelling receptors, the key considerations are:

- Whether a reflection is predicted to be experienced in practice.
- The duration of the predicted effects, relative to thresholds of:
  - 3 months per year.
  - 60 minutes on any given day.

14.5.9. Where no solar reflections are geometrically possible or where solar reflections are predicted to be significantly screened, no impact is predicted, and mitigation is not required.

14.5.10. Where effects are predicted to be experienced for less than 3 months per year and less than 60 minutes on any given day, or where the separation distance to the nearest visible reflecting panel is over 1km and in this case beyond the study area, the impact significance is low, and mitigation is not proposed at this stage.

14.5.11. Where effects are predicted to be experienced for more than 3 months per year and/or for more than 60 minutes on any given day, expert assessment of the following factors is required to determine the impact significance:

- Whether visibility is likely from all storeys – the ground floor is typically considered the main living space and has a greater significance with respect to residential amenity.
- The separation distance to the panel area – larger separation distances reduce the proportion of an observer's field of view that is affected by glare.
- Whether the dwelling appears to have windows facing the reflecting area – factors that restrict potential views of a reflecting area reduce the level of impact.
- The position of the sun – effects that coincide with direct sunlight appear less prominent than those that do not.

[10] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Fourth-Edition.pdf (pagerpower.com)

14.5.12. Following consideration of these factors, where the solar reflection does not remain significant, a low impact is predicted, and mitigation is not proposed at this stage. Where the solar reflection remains significant, the impact significance is moderate, and mitigation is recommended. Should mitigation be required, this is usually in the form of landscape planting or opaque fencing which will be designed to reduce any impacts and will be secured within the DCO.

14.5.13. Where effects are predicted to be experienced for more than 3 months per year and more than 60 minutes per day and there are no mitigating factors, the impact significance is high, and mitigation is required.

Road users

14.5.14. The key considerations for road users along major national, and regional roads are:

- Whether a reflection is predicted to be experienced in practice.
- The location of the reflecting panel relative to a road user's direction of travel.

14.5.15. Where no solar reflections are geometrically possible or where solar reflections are predicted to be significantly screened, no impact is predicted, and mitigation is not required.

14.5.16. Where reflections originate from outside of a road user's main field of view (50 degrees either side of the direction of travel), or where the separation distance to the nearest visible reflecting panel is over 1km, the impact significance is low, and mitigation is not recommended, in line with the Pager Power guidance[11].

14.5.17. Where reflections are predicted to be experienced from inside of a road user's main field of view, expert assessment of the following factors is required to determine the impact significance:

- Whether visibility is likely for elevated drivers (applicable to dual carriageways and motorways only) – there is typically a higher density of elevated drivers (such as HGVs) along dual carriageways and motorways compared to other types of roads.
- Whether a solar reflection is fleeting in nature. Small gap/s in screening (e.g., an access point to the site) may not result in a sustained reflection for a road user.

[11] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)

- The separation distance to the panel area – larger separation distances reduce the proportion of an observer's field of view that is affected by glare.
- The position of the sun – effects that coincide with direct sunlight appear less prominent than those that do not.
- Whether the solar reflection originates from directly in front of a road user – a solar reflection that is directly in front of a road user is more hazardous than a solar reflection to one side.

14.5.18. Following consideration of these mitigating factors, where the solar reflection does not remain significant, a low impact is predicted, and mitigation is not recommended. Where the solar reflection remains significant, the impact significance is moderate, and mitigation is recommended.

14.5.19. Where reflections originate from directly in front of a road user and there are no mitigating factors, the impact significance is high, and mitigation is required. Should mitigation be required, this is usually in the form of landscape planting or opaque fencing which will designed to reduce any impacts and will be secured within the DCO.

Railway receptors

14.5.20. The key considerations for quantifying impact significance for train driver receptors are:

- Whether a reflection is predicted to be experienced in practice;
- The location of the reflecting panel relative to a train driver's direction of travel;
- The workload of a train driver experiencing a solar reflection, which comprises the following factors;
    - Visibility of the signal from within the solar reflection zone.
    - The complexity of the railway i.e section of railway line where for example, there are multiple lines with switches and points, station approach, signals and road or pedestrian crossing.

14.5.21. Where reflections are geometrically possible but expected to be screened through existing vegetation, no impact is predicted, and mitigation is not required.

14.5.22. Where reflections originate from outside of a train driver's primary horizontal field of view (30 degrees either side of the direction of travel), or the closest reflecting panel is over 500m from the railway

user, the impact significance is low, and mitigation is not recommended, in line with the Pager Power guidance[12].

14.5.23. Where reflections are predicted to be experienced from inside of a train driver's primary field of view, expert assessment of the following mitigating factors is required to determine the impact significance and mitigation requirement:

- Whether the solar reflection originates from directly in front of a train driver. Solar reflections that are directly in front of a train driver are more hazardous;
- The separation distance to the reflecting panel area. Larger separation distances reduce the proportion of an observer's field of view that is affected by glare;
- The position of the sun. Effects that coincide with direct sunlight appear less prominent than those that do not. The Sun is a far more significant source of light; and
- Whether a signal, station, level crossing, or switching point is located within the reflection zone.

14.5.24. Following consideration of these factors, where the solar reflection does not remain significant, a low impact is predicted, and mitigation is not proposed at this stage.

14.5.25. Where reflections originate from directly in front of a train driver and there are no further mitigating factors, the impact significance is high, and mitigation is required. As this preliminary assessment shows, there are no reflections that are rated as high in significance. Indeed, there are no expected impacts from glint and glare on the railway.

Aviation receptors

14.5.26. The approach phase (arrival flight paths) is considered in the estimation of impact as this is deemed to be the most sensitive phase of a flight. Departing aircraft will have the nose pointing upwards and the visibility of objects (i.e. reflective panels) located on the ground will be reduced and therefore this has not been considered in this preliminary assessment.

14.5.27. For the runway approach paths, in line with the Pager Power guidance[13], the key considerations are:

[12] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)
[13] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)

- Whether a reflection is predicted to be experienced in practice.
- The location of glare relative to a pilot's primary field of view (50 degrees either side of the approach bearing).
- The intensity of glare for the solar reflections:
    - Glare with 'low potential for temporary after-image' (green glare).
    - Glare with 'potential for temporary after-image' (yellow glare).
    - Glare with 'potential for permanent eye damage' (red glare).
- Whether a reflection is predicted to be operationally significant in practice or not. To determine whether the solar reflections with the potential for temporary after-image can be operationally accommodated, the following factors are considered:
    - The likely traffic volumes and level of safeguarding at the aerodrome – licensed aerodromes typically have higher traffic volumes and are formally safeguarded;
    - The time of day at which glare is predicted and whether the aerodrome will be operational such that pilots can be on the approach at these times;
    - The duration of any predicted glare – glare that occurs for low durations throughout the year is less likely to be experienced than glare that occurs for longer durations throughout the year;
    - The location and size of the reflecting panel area relative to a pilot's primary field-of-view;
    - The location of the source of glare relative to the position of the sun at the times and dates in which solar reflections are geometrically possible – effects that coincide with direct sunlight appear less prominent than those that do not;
    - The level of predicted effect relative to existing sources of glare – a solar reflection is less noticeable by pilots when there are existing reflective surfaces in the surrounding environment.

14.5.28. Where no solar reflections are geometrically possible or where solar reflections are predicted to be significantly screened, no impact is predicted, and mitigation is not required.

14.5.29. Where solar reflections are of an intensity no greater than 'low potential for temporary after-image' (green glare) or occur outside of a pilot's primary field of view (50 degrees either side of the approach bearing), the impact significance is low, and mitigation is not recommended.

14.5.30. As detailed in the Pager Power guidance, where solar reflections are of an intensity no greater than 'low potential for temporary after-image' expert assessment of the following relevant factors is required to determine the impact significance:

- The likely traffic volumes and level of safeguarding at the aerodrome. Licensed aerodromes typically have higher traffic volumes and are formally safeguarded. Unlicensed aerodromes have greater capacity for operational acceptance.
- The time of day at which glare is predicted. Will the aerodrome be operational such that pilots can be on the approach at the time of day at which glare is predicted?
- The duration of any predicted glare. Glare that occurs for low durations throughout the year is less likely to be experienced than glare that occurs for longer durations throughout a year.
- The location of the source of glare relative to a pilot's primary field of view (50 degrees either side of the approach bearing). Do solar reflections occur directly in front of a pilot?
- The relative size of the reflecting panel area. Does the reflecting area make up a large percentage of a pilot's primary field of view?
- The location of the source of glare relative to the position of the sun at the times and dates in which solar reflections are geometrically possible. Effects that coincide with direct sunlight appear less prominent than those that do not.
- The intensity of the predicted glare. Is the intensity of glare close to the green/yellow glare threshold on the intensity chart?
- The level of predicted effect relative to existing sources of glare. A solar reflection is less noticeable by pilots when there are existing reflective surfaces in the surrounding environment.

14.5.31. Following consideration of these factors, where the solar reflection does not remain significant a low impact is predicted and mitigation is not recommended.

14.5.32. Where solar reflections are of an intensity greater than 'potential for temporary after-image', the impact significance is high, and mitigation is required. As this preliminary assessment shows, there are no reflections that are rated as high in significance. Indeed, there are no expected impacts from glint and glare on aviation receptors.

Significance criteria

14.5.33. A summary of the significance criteria, derived from the Pager Power guidance[14], has been used to determine the level of glint and glare effects is presented in **Table 14-1**.

Table 14-1 Significance criteria

Significance	Definition	Mitigation Requirement
No Impact	A solar reflection is not geometrically possible or will not be visible from the assessed receptor	No mitigation required
Low	A solar reflection is geometrically possible however any impact is considered to be small such that mitigation is not required e.g. intervening screening will limit the view of the reflecting solar panels significantly	No mitigation required
Moderate	A solar reflection is geometrically possible and visible however it occurs under conditions that do not represent worst-case given individual receptor criteria outlined in the associated guidance[15]	Mitigation recommended
High	A solar reflection is geometrically possible and visible under worst-case conditions that will produce significant impact given individual receptor criteria outlined in the associated guidance[16]	Mitigation will be required if the Proposed Development is to proceed

14.5.34. A preliminary assessment, which has included modelling and consideration towards the existing vegetation screening that is present within the intervening landscape, has been undertaken. This has been carried out in parallel with the design evolution of the

[14] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)
[15] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)
[16] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)

Proposed Development to help inform the iterative design and landscaping strategy.

14.6. Likely effects and mitigation

14.6.1. This preliminary assessment has identified that the majority of the Proposed Development will have low or no glint and glare impacts.

14.6.2. This preliminary assessment has identified that there are no likely significant effects anticipated on aviation receptors.

14.6.3. This preliminary assessment has identified that there are no likely significant effects anticipated on railway receptors.

14.6.4. Apart from the one property below, this preliminary assessment has identified that there are no likely significant effects anticipated on residential properties.

14.6.5. The preliminary assessment identified one property as having moderate impacts due to effects being predicted to be experienced for more than three months per year but less than 60 minutes per day, and due to the lack of existing sufficient mitigating factors such as full intervening screening. These impacts are being reviewed and mitigated to remove those moderate impacts through best practice mitigation strategies, which will likely include landscaping and hedgerow planting to fill existing gaps or other design changes, including layout modifications and alterations to the angles of the Solar PV modules, if required.

14.6.6. A small section of the A15 on the northbound section, located in the south of Springwell West, before reaching the B1191 junction has been identified as having a potential moderate/high impact and these too are currently being considered further as part of the ongoing design evolution of the Proposed Development and as part of developing mitigation for any glint and glare impacts, which includes landscaping and hedgerow planting in these areas. Other mitigation measures, such as layout modifications and alterations to the angles of the Solar PV modules, are also being considered to remove the glint and glare impacts.

14.6.7. Apart from the small section of the A15, there are no likely significant effects anticipated on the B1191 and B1188.

14.6.8. The assessment outputs have helped inform the design of the Proposed Development and the mitigation strategy. The mitigation and landscaping strategy is being developed to remove moderate and above impacts, with the intention that the design of the Proposed Development to be submitted in the DCO application will produce low or no glint and glare impacts and the effects would be reduced to minor and not significant.

14.6.9. A full glint and glare technical assessment will form an appendix to the ES, as required by the Scoping Opinion, which will assess the submitted design and identify any required additional mitigation.

14.6.10. Landscape planting that is required to mitigate any glint and glare impacts will be documented within and secured by the Outline Landscape and Ecological Management Plan.

14.7. Difficulties and uncertainties

14.7.1. The information provided in this PEIR is preliminary and is based on the information available at the time of writing. The final assessment of impacts will be reported in the ES.

14.7.2. The preliminary assessment has been undertaken using high level modelling to determine the potential effects of the maximum extent of Solar PV development. The full glint and glare assessment will be informed by the design of the Proposed Development included in the DCO application and the parameters that will inform the ES.

14.8. Further work to inform the ES

14.8.1. The impacts are being considered as part of the ongoing design evolution of the Proposed Development and as part of developing mitigation for any glint and glare impacts, such as landscaping and hedgerow planting. The landscape design is being progressed to inform the ES and proposed planting will be considered in the full glint and glare assessment.

14.8.2. A full glint and glare assessment will be informed by the design of the Proposed Development to be submitted in support of the DCO application and will form a technical appendix to the ES.

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