DARWIN ECOLOGY
integrating nature conservation

Unit 13 & 14, Sandy Farm Business Centre, Sands Road, Farnham, GU10 1PX
Email: info@darwin-ecology.co.uk www.darwin-ecology.co.uk

Biodiversity Net Gain Assessment

Solar Project
Land at Petersfinger Farm
Petersfinger
Salisbury
Wiltshire

May 2023

Darwin Ecology Ltd
Registered Office: 8 Layton Lane, Shaftesbury, Dorset SP7 8EY
Company No. 07654823

1. EXECUTIVE SUMMARY 4

2. INTRODUCTION AND BACKGROUND 5

3. LEGISLATIVE AND POLICY BACKGROUND 7

4. METHODOLOGY 9

Assumptions and Limitations 10

5. BIODIVERSITY NET GAIN ASSESSMENT 12

6. REFERENCES 19

APPENDICES

QUALITY CONTROL		
The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct.		
Prepared by	Sophie Higgins - Senior Ecologist Jessie Forster - Consultant Ecologist	November 2022 March 2023
Checked by	Olatz Gartzia - Senior Ecologist	April 2023
Amended by	Jessie Forster - Consultant Ecologist	May 2023
This report remains valid for 12 months from date of issue.		

Copyright Darwin Ecology Ltd.

This report is intended for the commissioning party only and should not be copied or reproduced in any way without prior written permission from Darwin Ecology Ltd.

This report has been prepared for the sole use of the client. Any third party referring to this report or relying on the information contained herein, does so entirely at their own risk.

Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living creatures are capable of migration and whilst protected species may not have been located during the survey duration, their presence may be found on site at a later date.

The views and opinions contained within the document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to works.

1. EXECUTIVE SUMMARY

1.1. This report has been produced to provide the results of the Biodiversity Net Gain calculation at Petersfinger Farm, Salisbury, SP5 3EU, in order to ensure compliance with the *National Planning Policy Framework (2021)* regarding no net-loss of biodiversity.

1.2. The proposals are for the installation of solar panels within the site with associated access track, cabin and storage buildings.

1.3. Biodiversity Net Gain Assessments calculate the change in ecological value at a site by comparing the number of 'biodiversity units' within the site pre- and post-construction, for both linear habitats and areas of habitat, and demonstrating measurable loss or gain. The ecological value of the site is expressed as a percentage change in total Biodiversity Units following implementation of the proposals. Various forms of the metric are available, *DEFRA: The Biodiversity Metric 3.1* has been used to complete this assessment.

1.4. The proposals will result in the loss of semi-improved mesotrophic grassland (modified grassland) grassland totalling 0.12 ha. The baseline site provides a 29.95 habitat units. In addition, a series of hedgerows and line of trees totalling 1 km provides 10.16 linear units for the site.

1.5. The proposals will retain all boundaries.

1.6. Post-construction the works will retain semi-improved mesotrophic grassland (modified grassland) and floodplain wetland mosaic (CFGM) beneath the solar array, and create 0.12 ha of sealed surface access and facilities.

1.7. With the retention of the existing modified grassland and CFGM habitat, the enhancement of a border of these habitats around the solar array, the enhancement of hedgerows, and creation of a new native hedgerow, the site can achieve a +5.91% net gain in habitat units and +10.74% net gain for linear features on site. Although this provides a net gain, it does not meet the required 10% net gain to satisfy the trading rules.

1.8. The additional net gain for habitats to provide 10% will be achieved by enhancing the field to the south of the site from moderate to good, by a reduction in grazing and management of the ditches.

1.9. It is recommended that a biodiversity management plan is written to ensure the habitats created meet their target score.

2. INTRODUCTION AND BACKGROUND

2.1. This report has been produced to provide the results of the Biodiversity Net Gain calculation at Petersfinger Farm, Salisbury, SP5 3EU, in order to ensure compliance with the *National Planning Policy Framework (2021)* regarding no net-loss of biodiversity.

2.2. The proposals are for the installation of solar panels within the site with associated access track, cabin and storage buildings. The solar site forms part of a multi-phase master plan for the site which is in the same ownership. New residential phases are proposed to the north which will be submitted as by seperate applications but for the purposes of BNG the site has been divided into discrete units that do not cross over

2.3. This assessment is based on the proposals as shown in **Illustration 1** below, and the landscape plan (see **Appendix**).

Site Overview

2.4. The site is located to the east of Salisbury and immediately south of the A36. There is a sewage treatment works bordering the site to the west and on a wider scale Salisbury extends north-west of the site and elsewhere the site is surrounded largely by rural fields.

2.5. The site comprises a variety of habitats including grassland, scrub, ditches, and lines of trees and hedgerows (see **Figure 1**).

2.6. The wider landscape comprises agricultural fields with associated hedgerows, and the urban area of Salisbury to the north west. The site sits within the Avon Valley and borders the River Avon SAC and River Avon System SSSI. The proposed site also adjacent to fields which have been designated as a County Wildlife site to the North-east.

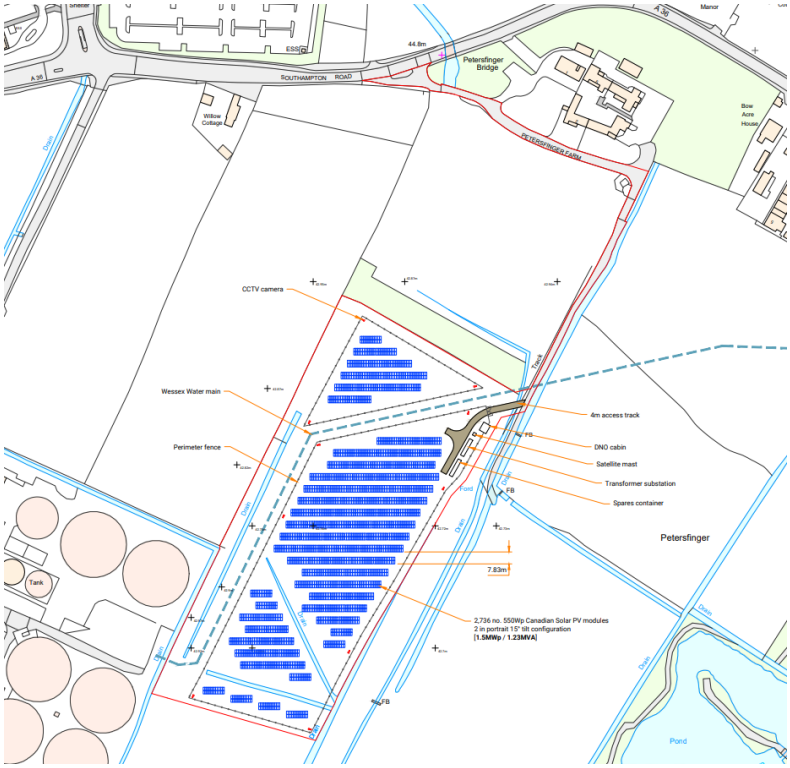

Illustration 1: Proposed site layout



Figure 1: Site location within the local landscape (Copyright Google Maps, 2022)



Figure 2: Site location within the wider landscape (Copyright Google Maps, 2022)

3. LEGISLATIVE AND POLICY BACKGROUND

National Planning Policy Framework (NPPF) 2021

3.1. The NPPF aims to minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. Chapter 15 'Conserving and enhancing the natural environment' details what local planning policies should seek to consider with regard to planning applications:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

174 a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

174 d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;

Habitats and biodiversity

179. To protect and enhance biodiversity and geodiversity, plans should:
a) identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation and

b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species and identify and pursue opportunities for securing measurable net gains for biodiversity.

180. When determining planning applications, local planning authorities should apply the following principles:

a) if significant harm to biodiversity resulting from a development cannot be avoid (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) development on land within or outside of Sites of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the feature of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around development should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

4. METHODOLOGY

4.1. The Biodiversity Metric 3.1 uses habitat as a proxy for overall biodiversity within different habitat types. Habitats are assigned a value based on their intrinsic biodiversity value or 'distinctiveness', which is predefined for each habitat within the metric. This value is then adjusted based on the size, condition and location of the habitat, to calculate its value in 'biodiversity units'. Separate calculations are incorporated into the metric for area-based habitats, linear (such as hedgerows) and rivers (including ditches and streams). These units are non-transferable and must be considered individually for each project or development.

4.2. DEFRA provides a Calculation Tool with all calculations built in to aid in the assessment process.

4.3. Underlying this assessment process are a set of key principles which explain the intended use of the metric. These are as follows:

- Principle 1 - The metric does not change the protection afforded to biodiversity;
- Principle 2 - Biodiversity metric calculations can inform decision-making where application of the mitigation hierarchy and good practice principles conclude that compensation for habitat losses is justified;
- Principle 3 - The metric's biodiversity units are only a proxy for biodiversity and should be treated as relative values;
- Principle 4 - The metric focuses on typical habitats and widespread species; important or protected habitats and features should be given broader consideration;
- Principle 5 - The metric design aims to encourage enhancement, not transformation, of the natural environment;
- Principle 6 - The metric is designed to inform decisions, not to override expert opinion;
- Principle 7 - Compensation habitats should see, where practical, to be local to the impact;
- Principle 8 - The metric does not enforce a mandatory minimum 1:1 habitat size ratio for losses and compensation but consideration should be given to maintaining habitat extent and habitat parcels of sufficient size for ecological function.

4.4. In the process of undertaking a biodiversity net gain assessment using the DEFRA Metric 3.1, the following rules must be adhered to in order to ensure its proper use:

- Rule 1 - Where the metric is used to measure change, biodiversity unit values need to be calculated prior to the intervention and post-intervention for all parcels of land / linear features affected;

- Rule 2 - Compensation for habitat losses can be provided by creating new habitats, or by restoring or enhancing existing habitats. Measures to enhance existing habitats must provide a significant and demonstrable uplift in distinctiveness and/or condition to record additional biodiversity units;
- Rule 3 - 'Trading down' must be avoided. Losses of habitat are to be compensated for on a "like-for-like" or "like-for-better" basis. New or restored habitats should aim to achieve a higher distinctiveness and/or condition than those lost. Losses of irreplaceable or very high distinctiveness habitat cannot adequately be accounted for through the metric;
- Rule 4 - Biodiversity unit values generated by the DEFRA Metric 3.1 are unique to this metric and cannot be compared to unit outputs from version 2.0 or 3.0, the original DEFRA metric or any other biodiversity metric. Furthermore, the three types of biodiversity units generated by this metric (for area, hedgerow and river habitats) are unique and cannot be summed;
- Rule 5 - It is not the area / length of habitat created that determines whether ecological equivalence or better has been achieved but the net change in biodiversity units. Risks associated with creating or enhancing habitats mean that it may be necessary to create or enhance a larger area of habitat than that lost, to fully compensate for impacts on biodiversity; and
- Rule 6 - Deviations from the published methodology of the DEFRA Metric 3.1 need to be ecologically justified and agreed with relevant decision makers. While the methodology is expected to be suitable in the majority of circumstances it is recognised that there may be exceptions. Any local or project-specific adaptations of the metric must be transparent and fully justified.

Assumptions and Limitations

4.5. The baseline grassland is shown on Magic Maps as priority habitat coastal and floodplain grazing (CFGM), however, the baseline botanical surveys (Phase II botanical survey of meadows at Petersfinger, Salisbury, Ulex Ecology 2021) confirmed the northern part of the Site (see **Figure 3**) does not currently meet the criteria for this priority habitat, likely due to the high intensity of grazing. It was assessed to have the highest coefficient match to MG6 - *Lolium perenne* grassland. Therefore, for this assessment, the northern part of the site has been classified as modified grassland.

4.6. It has been assumed that the installation of the solar panels will be able to retain the existing grassland within the development footprint in the current moderate condition.

4.7. The area within the red line boundary in relation to the installation of the connection cable route around the sewage works has not been considered in this assessment. It is assumed that this cable can be installed in a sensitive manor, with no disturbance or impact to the

habitats present. Recommendations for a method statement for the installation to protect hedgerows and root protection zones will be made within the Landscape Ecological Management Plan for the Site.

5. BIODIVERSITY NET GAIN ASSESSMENT

Pre-development Habitats

5.1. Below is a summary of the habitats recorded on site during the botanical walkover surveys undertaken by Ecologist Becca Oswin and Mariko Whyte, on the 5th May 2021 and from the National Vegetation Classification (NVC) surveys were carried out by Ulex Ecology in May and June 2021 using the National Vegetation Classification methods.

5.2. In order to translate habitats from the Phase 1 system to UKHab, the "UKHab / Phase 1 Translation" tab within the Calculation Tool was utilised.

5.3. Corresponding maps are provided at **Figure 3, Pre-Development Habitat Plan.**

Semi-Improved Grassland

5.4. The northern section of the site is comprised of a large area of semi-improved mesotrophic grassland, with most of the interest found in the damper ditches that bisect the area. The grassland was dominated by soft brome (*Bromus hordeaceus*), probably as a legacy of preferential grazing by sheep, with large amounts of creeping bent (*Agrostis stolonifera*). A few forbs were recorded here, but tended to be species with a preference for elevated nutrient levels and disturbance, such as silverweed (*Potentilla anserina*), fleabane (*Erigeron sp.*) and common nettle (*Urtica dioica*).

5.5. In the NVC surveys of the site undertaken in May and June classified that 'Area 4' (the northern part of the Site - see **Figure 3**) was confirmed not to qualify as priority habitat of CFGM, likely due to the level of sheep grazing. This area had the highest coefficient match to MG6 - *Lolium perenne* grassland (common habitat in agricultural systems), and has therefore been classified as Modified Grassland for the purposes of the BNG calculations.

Grassland - Floodplain Wetland Mosaic (CFGM)

5.6. The southern part of the Site was described as damp meadow, with a broad mix of species associated with neutral soils with impeded drainage. Despite initially showing good potential the sheep had been returned to this field during the second botanical survey in June, meaning fewer forbs than expected were recorded.

Damp Ditches

5.7. Several ditches occurred at the southern end and eastern boundary of the site, and these were typically dominated by reed Canary-grass (*Phalaris arundinacea*) with abundant and ruderal vegetation often dense stands of common reed (*Phragmites australis*) and bulrush (*Scirpoides holoschoenus*) giving way to stands of common nettle in the drier edges.

5.8. Ditches form an integral part of the floodplain grazing habitat, and have therefore been included within the grassland area.

Hedgerows

5.9. There are four hedgerows on site:

- Hedge 1 is on the north boundary of the site and features mixed deciduous trees with conifer species and bramble (*Rubus fruticosus*) and a hawthorn (*Crataegus monogyna*) understory.
- Hedge 2 runs along the western boundary of the site towards the northern end. It it dominated by willow species (*Salix spp.*), other species present include blackthorn (*Prunus spinosa*), bramble and ash (*Fraxinus spp.*). Some veteran trees are also present.
- Hedge 3 runs along the western boundary of the site towards the southern end and includes alder (*Alnus sp.*) and willow scrub.
- Hedge 4 is a fragmented willow tree line that runs the length of the eastern boundary of the site.

Baseline value

Habitats

5.10. **Table 1** below, details the specific area-based habitat types, their relative conditions and baseline area unit values.

Linear Habitats

Table 1: Summary of baseline assessment for area-based habitats

Ref.	Broad Habitat	Habitat	Distinctiveness	Area (ha)	Condition	Units
F7	Grassland	Floodplain wetland mosaic (CFGM)	High	1.854	Moderate	24.47
F8	Grassland	Modified Grassland	Low	1.245	Moderate	5.48
				3.1		**29.95**

5.11. **Table 2** below, details the specific linear habitat types, their relative conditions and baseline linear unit values.

Table 2: Summary of baseline assessment for linear habitats

Ref.	Linear Habitat	Distinctiveness	Length (km)	Condition	Units
H1	Line of trees	Low	0.12	Poor	0.26
H2	Native hedgerows with associated bank or ditch	Medium	0.28	Good	3.70
H3	Native hedgerows with associated bank or ditch	High	0.23	Good	4.55
H4	Line of trees - associated with bank or ditch	Low	0.3	Moderate	1.32
			1		**10.16**







Target reference	Hedgerow description
H1	Mixed deciduous trees with conifer species and bramble and hawthorn understory
H2	Hedgerow dominated by willow species. Blackthorn, Bramble and Ash also present. Some veteran trees present.
H3	Alder and willow scrub hedge
H4	Fragmented willow tree line

Red line boundary of proposed solar site

Line of Trees

Native Hedgerow with trees - Associated with bank or ditch

Native Hedgerow associated with bank or ditch

Vegetated ditches

Heavily grazed floodplain grazing marsh

Semi-improved grassland

Existing track

SSSI / SAC

CWS

DARWIN ECOLOGY
integrating nature conservation

Info@darwin-ecology.co.uk
www.darwin-ecology.co.uk

Project: Petersfinger Solar Project

Figure 3: Existing baseline conditions

Date: May 2023

Post Development Metric Calculations

5.12. The post-development proposals for the site include retained CFGM and semi-improved grassland, creation of development sealed surfaces for an access road and storage buildings, enhancement of existing hedgerows, and creation of a new section of native hedgerow.

5.13. As noted above, it has been assumed that the installation of the solar panels can be done while retaining the existing grassland within the site. It is anticipated that there will be a temporary impact on the grassland within the development footprint during the construction phase, however, the grassland is expected to be managed to return to a similar or better condition post-construction. Due to the impact of the solar array, this habitat post development is not anticipated to improve in condition for the purposes of this metric.

5.14. To create an access track and small facilities buildings, approximately **0.12 ha** of sealed surface will be created, resulting in the permanent loss of this small amount of semi-improved (modified) grassland habitat.

Headline Results

5.15. As demonstrated in **Table 3** below, the biodiversity net gain results show an overall **net loss** in area habitats on site.

5.16. The trading summary has not been satisfied within the post-development habitats as there is an overall loss in habitat units on site.

Table 3: Summary of biodiversity net gain assessment

Unit Type	Baseline Units	Post-development Units	Net Unit Change
Area	29.95	29.44	-0.51
Linear	10.16	0	0

Recommendations

5.17. To reduce the amount of habitat units lost on site the following recommendations have been made:

- Enhance the existing grassland around the buffer area outside of the proposed new security fencing around the solar array. This area totals 0.81 ha. Enhancement of this area by increasing species diversity and sward structure with appropriate management would allow the condition of this habitat to improve and potentially meet a good condition score. The enhancement of this area of grassland could achieve a **+9.8 habitat units** for the site.

- Enhancement of all boundary features H1, H3 and H4 to good will provide a **+0.69 linear units** for linear features on site. In addition, the creation of an additional 110 m of native mixed hedgerow will provide and additional **+0.41 linear units.**
- Off-site enhancements to CFGM habitat within the ownership boundary (1.37 ha directly south of the site) from moderate to good condition will provide an additional net gain in habitat units. ***The management plan involves a reduced sheep grazing scheme, however the negative affect of sheep grazing on this habitat was noted during the botanical surveys. Therefore it is recommended that sheep are kept off of this area during the summer months to achieve good condition.*** The enhancement of this field would achieve **+23.34** habitat units off site.

5.18. The above recommendations for on-site and off-site enhancements can achieve a **+23.45%** net gain in habitat units and **+10.74%** net gain for linear features on site. See **Figure 4** for details of recommended compensation and enhancement measures.

Application of the Mitigation Hierarchy

5.19. Where possible, all habitats of higher 'distinctiveness' have been retained. Where losses have been unavoidable, compensation and enhancements have been incorporated into the design in order to ensure compliance with Rule 3 and Principle 7 of the Metric User Guide. **Table 4** demonstrates how the mitigation hierarchy has been applied to all habitats on site in accordance with Principle 2 of the Metric User Guide.

Table 4: Application of the mitigation hierarchy

Existing Broad Habitat Type	Impacts Avoided?	Habitat Loss?	Compensation Needed?	Details / Recommendations
Modified Grassland	No	Loss of habitat to development footprint.	Yes	Retained areas beneath the solar panels, to be maintained in current condition. Enhanced areas between the boundary hedgerows and security fencing. This area will have a reduction in grazing pressure to allow the condition to be improved from moderate to good (or better).

Table 4: Application of the mitigation hierarchy

Existing Broad Habitat Type	Impacts Avoided?	Habitat Loss?	Compensation Needed?	Details / Recommendations
Grassland floodplain wetland mosaic (CFGM)	No	No loss provided mitigation is followed and habitat is managed appropriately post-construction.	No	Retained areas beneath the solar panels, to be maintained in current condition. Enhanced areas between the boundary hedgerows and security fencing. This area will be have a reduction in grazing pressure to allow the condition to be improved from moderate to good (or better).
Line of trees and native hedegrows with associated banks or ditches	Yes	No loss	No	Boundary features to be retained and H2, H3 and H4 enhanced.

Compensation and Enhancements

5.20. Biodiversity units are more easily achievable when habitats are retained and protected during construction and subsequently enhanced through improved management practices or additional planting (Principle 5 of the Metric User Guide). Therefore, as per the mitigation hierarchy, the improvement of the distinctiveness or condition (or both) of the retained habitats should always be a high priority.

5.21. **Table 5** below details the compensation and enhancement measures which will be used in order to achieve the net gain in area and linear units stated above.

Table 5: Summary of proposed habitat enhancements

Broad Habitat Type	Proposed Compensation or Enhancement Measure	Delivery Details
Linear Features		
Hedgerows	Enhancement of 0.12 km of line of trees (poor to moderate), 0.30 km. of line of trees with associated bank or ditch (moderate to good)	Include at least five woody species including blackthorn, hazel, hawthorn, elder, holly and beech.
Hedgerows	Creation of 0.110 km of native mixed hedgerow (moderate or better) along southern boundary of site	Native hedge mix with native riparian species in a double staggered row to provide wildlife corridors and landscape structure. Retain existing vegetation.
High Distinctiveness Habitats		

Table 5: Summary of proposed habitat enhancements

Broad Habitat Type	Proposed Compensation or Enhancement Measure	Delivery Details
Grassland floodplain wetland mosaic (CFGM)	Enhance 0.45 ha of retained grassland within the site to create a buffer around the security fencing from moderate to good condition.	Reduce the grazing pressure to improve species diversity to allow Criteria 2 to be met in addition to Criteria 1, 3, 4 and 6. Criteria 5 is unlikely to be met as rabbits are present within the site and wider area. Improve the condition of the ditches across the site to good to meet criteria 7d.
	Enhance 1.37 ha to the south of the site from moderate to good condition.	
Grassland modified	Enhance 0.36 ha of retained modified grassland on site from moderate condition to good condition or better.	Variation of sward height through appropriate management will allow habitat to pass 6 of 7 criteria within the condition assessment, and should aim to also increase species diversity.

Recommendations

5.22. A biodiversity management plan will be prepared for the site and issued in a separate document to ensure that all habitats created obtain their target scores.



Development boundary

Semi-improved mesotrophic grassland beneath solar array to be retained in current condition

Area of CFGM beneath solar array, to be retained in current condition

On-site grassland to be enhanced

Off-site CFGM to be enhanced

Hardstanding

New native hedgerow

Line of trees

Existing hedgerow to be enhanced

SSSI / SAC

CWS

DARWIN ECOLOGY
integrating nature conservation

Info@darwin-ecology.co.uk
www.darwin-ecology.co.uk

Project: Petersfinger Solar Project

Figure 4: Post development habitat recommendations

Date: May 2023

6. REFERENCES

The Biodiversity Metric 3.1 - Technical Supplement Beta Version http://publications.naturalengland.org.uk/publication/6049804846366720

The Biodiversity Metric 3.1 - User Guide Beta Version http://publications.naturalengland.org.uk/publication/6049804846366720

Darwin Ecology (2022) *Ecological Impact Assessment Report Solar Project Petersfinger*

Ulex Ecology (2021) *Phase II botanical surveys of meadows at Petersfinger, Salisbury.*