

**MANOR FARM, SHRIPNEY: SOLAR PARK
ECOLOGICAL APPRAISAL
for
BNRG RENEWABLES LTD
May 2014**



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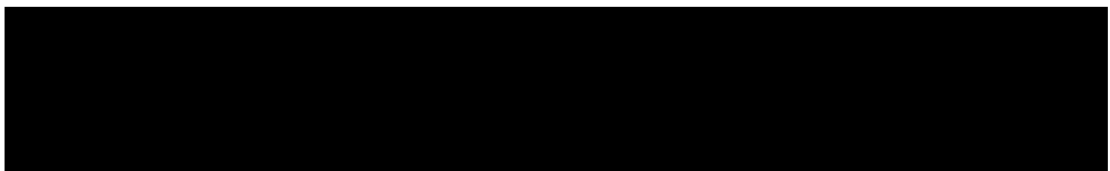
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EXECUTIVE SUMMARY

The Landmark Practice (TLP) was commissioned by BNRG Renewables Ltd in July 2013 to assess the potential ecological impacts associated with a proposed solar park at Manor Farm on the edge of Shripney. The site is located approximately 500 m north of Bognor Regis, Sussex.

This report identifies and assesses the value of ecological receptors within and directly adjacent to the application site and determines potential impacts arising from the proposed development. Recommendations are made for measures to avoid impacts, to provide mitigation/compensation measures where necessary as well as ecological enhancements.

The following table summarises the key ecological issues arising from the proposed development, and the mitigation and enhancement strategies proposed.

Site Description & Development Proposals	
What surveys have been undertaken?	The site was subject to a desk study and an Extended Phase I habitat survey.
Designated Sites	
Are any designated sites located within 1 km of the application site?	Yes
If yes, provide details:	Bersted Brooks Local Nature Reserve (LNR) located 160 m south-east of the site.
Is the development likely to have an impact on these sites?	No
Habitats	
Phase I habitat types present <u>within</u> the application site	Arable margins, arable fields, hedgerows, a reservoir, a building and ditches.
Phase I habitat types located <u>adjacent</u> to the application site	Unimproved grassland, farmland (both arable and pasture), woodland, hedgerows and ditches.
European Protected Species	
Does the site provide habitat for European Protected Species?	Potentially (mainly associated within the boundary habitats).
If yes, provide details:	These habitats may potentially support otter, great crested newt and bats.
Will the development have an impact on these species?	No, providing the mitigation strategy is implemented.
Other Legally Protected Species	
Does the site provide habitat for other legally protected species?	Potentially (mainly associated within the boundary habitats).
If yes, provide details:	These habitats may potentially support water vole, breeding birds and common reptile/amphibian species.
Will the development have an impact on these species?	No, providing the mitigation strategy is implemented.
Notable Habitats / Species (incl. Principal Importance & LBAP Habitats / Species ¹)	
Does the site contain Notable Habitats/Habitats of Principal Importance/LBAP Priority Habitats?	Yes
If yes, provide details:	Hedgerows, arable margins and ditches.
Will the development have an impact on these habitats?	No, providing the recommended mitigation strategy is implemented.
Notable Habitats/Species (incl. Principal Importance & LBAP Habitats/Species ²) cont'd...	

¹ See Appendix I for details

Does the site contain Notable Species/Species of Principal Importance/LBAP Priority Species?	Yes (potentially)
If yes, provide details:	Certain bat species, hedgehog, brown hare, otter, water vole (potentially), skylark, song thrush, yellowhammer, linnet, lapwing, certain reptile species, great crested newt (potentially) and common toad.
Will the development have an impact on these species?	No, providing the recommended mitigation strategy is implemented.
Are avoidance, mitigation/compensation measures proposed?	Yes
If yes, provide details:	A wildlife protection zone should be implemented around the development to protect habitats and species within the site boundary from damage/disturbance. Permanent security fencing should be used to protect sensitive habitats Badgers- trenches should not be left open overnight or should be fitted with a rough sawn plank. To allow continued access a panel should be raised every 100m or mammal gates created. Other wildlife- no lighting or night-time working should be undertaken. Nesting birds– any hedgerow/tree management should be undertaken outside the breeding bird season. Amphibians and reptiles- the panels should be installed over winter when reptiles are hibernating.
Are ecological enhancements provided?	Yes
If yes, provide details:	Hedgerow planting. Erection of bird and bat boxes. Installation of an interpretation board. The pond in the LNR will be enlarged and a dipping platform will be installed, so it can be used as an educational resource.

Subject to implementation of the compensation and mitigation measures discussed in **Sections 7 and 8** of this report, the assessment concludes the proposed development is capable of being accommodated without significant negative impacts on ecologically sensitive receptors within the survey area.

² See Appendix I for details

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- Appendix II: Ecological Evaluation Techniques**
- Appendix III: Survey Photographs**
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1.0 INTRODUCTION

Scope of Report

- 1.1 The Landmark Practice (TLP) was commissioned by BNRG Renewables Ltd in July 2013 to undertake an Ecological Appraisal of land at Shripney, near Bognor Regis, Sussex. The purpose of this report is to inform a planning application for a proposed solar park of approximately 21 MW generating capacity at the site.
- 1.2 This report identifies and assesses the value of ecological receptors within and directly adjacent to the site and identifies the potential impacts arising from the proposed development. Where considered necessary, recommendations are made for further surveys and mitigation measures.

Site Location and Description

- 1.3 The application site is approximately 50 ha in area and is located on agricultural land in Shripney to the north of Bognor Regis (OS grid reference SU928024; **Figure 1** refers). The site is situated approximately 500 m north from the edge of Bognor Regis. The application site currently comprises arable land and is surrounded by hedgerows, woodland and ditches.

Development Proposals

- 1.4 Details of the proposed development masterplan, including panel arrangement, is provided in Appendix IV (**Drawing 2563/100** refers). The solar park will be set out in rows of module tables, lined from east to west and orientated to the south in order to capture maximum solar energy. Sufficient space (approximately 6 m) will be allowed between the rows to avoid one row of PV modules overshadowing the next.
- 1.5 The PV modules will be mounted on metal frames on posts piled into the ground causing minimal impact on the ground surface and will be fully removable on decommissioning. The modules will be approximately 2.4 m above ground, with the panels mounted in landscape format, set at an angle of approximately 25 degrees. The lowest point of the solar panel tables will be a minimum of 0.8 m above ground level. A detailed plan showing the panel elevation is provided in Appendix IV (**Drawing 2563/300** refers).
- 1.6 The application site will be protected with an approximately 2.4 m high deer fence (Appendix IV **Drawing 2563/400** refers) which is sympathetic to the rural location. For additional security, infra-red sensor CCTV cameras will be utilised.
- 1.7 All existing boundary hedgerows and associated features will be retained. The external security fence will be off-set internally from the perimeter hedgerows by 8 m with the panels off-set from the fence by approximately 4 m. The ground under the panels will be maintained as grassland and will be managed by livestock grazing or mowing/cutting.
- 1.8 There will be no lighting of the site during its operation and BNRG do not envisage the use of lighting during the construction phase.

- 1.9 Once the solar park is established, the system will require minimal on-going maintenance. Experience has shown that PV modules are cleaned to a considerable degree by rainfall, but will also be manually cleaned several times a year.
- 1.10 Activity at the solar park will be limited to periodic repair and/or maintenance. Grassland will be managed over the likely 30 year life of the installation by sensitive habitat management.

Legal and Planning Context

Legal Context

- 1.11 A range of habitats and species that are or may be, relevant to the application site are afforded legal protection under National and International Legislation (**Appendix I** refers).

Planning Context

National Planning Policy Framework (NPPF)

- 1.12 The NPPF advises when determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:
- *“if significant harm resulting from a development cannot be avoided (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;*
 - *Proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted unless the benefits of the development clearly outweigh both the impacts that it is likely to have on the features of the site and any broader impacts on the national network of Sites of Special Scientific Interest;*
 - *Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;*
 - *Opportunities to incorporate biodiversity in and around developments should be encouraged;*
 - *Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss”; and*
 - Paragraph 109 refers to *“minimising impacts on biodiversity and providing net gains in biodiversity where possible”.*

National Planning Policy Guidance (NPPG)

- 1.13 The NPPG (DCLG, 2014) advises that information on biodiversity impacts and opportunities should inform all stages of development, from site selection and design, to include any pre-application consultation as well as the application itself. The guidance notes that *‘An ecological survey will be necessary in advance of a planning application if the type and location of development are such that the impact on biodiversity may be significant and existing information is lacking or inadequate. Pre-application discussion can help scope whether this is the case and, if so, the survey work required.’*

- 1.14 The guidance also notes that: *“Local planning authorities should only require ecological surveys where clearly justified, for example if they consider there is a reasonable likelihood of a protected species being present and affected by development. Assessments should be proportionate to the nature and scale of development proposed and the likely impact on biodiversity.”*

Local Planning Policy

- 1.15 The following saved policies of the Arun District Local Plan 2003 are relevant to consideration of the biodiversity implications of the proposed development:

Arun District Local Plan 2003

Policy GEN21 – Renewable Energy

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

- *there is no significant harmful environmental effect on the quality of the natural and built environments;...”*

Policy GEN29 – Nature Conservation across the District

“Development will only be permitted on sites which contain semi-natural habitats, features of nature conservation interest, or within wildlife corridors, where these can be largely retained and sympathetically incorporated into the scheme. Legal agreements may be used to offset the loss of, or impact on, any nature conservation resource present on the site prior to development.”

Arun District Submission Local Plan 2013

- 1.16 Arun District Council is currently developing its Draft Local Plan. The Council resolved on 11 February 2014 that emerging Local Plan policies were to be treated as a material consideration in the determination of planning applications, having regard to the advice in the National Planning Policy Framework.
- 1.17 The following policies have therefore informed this assessment:

Policy SP3 – Countryside

“To ensure better management of the rural-urban fringe in those areas where significant new development is proposed, early consideration will need to be given to landscape and biodiversity enhancement, woodland management, recreation provision and access routes.”

Policy DM21 – Renewable Energy

“The Council will support renewable energy development subject to the criteria in this Policy. Schemes will be expected to contribute to the social, economic and environmental development and overall regeneration of the District.

Within areas of protected or sensitive landscapes, areas or buildings, development should generally be small scale or community based. The Council will support proposals for appropriately located renewable energy development, and their ancillary development where they meet the following criteria:

- *The proposal is located and designed to minimise adverse impacts to landscape, habitats, the historic environment and residential amenity including visual, noise and odour impacts;*

- *The location and design of proposals will need to take account of the Council's landscape assessment and landscape sensitivity studies (or successor documents) and proposals for large scale renewable energy projects will need to be supported by a zone of theoretical visibility and viewpoint assessment;*
- *Proposals will need to demonstrate that there are no detrimental cumulative impacts on landscape character, biodiversity, key species or residential amenity;*
- *Proposals located within or close to the boundaries of areas designated for their landscape, ecological, or historic interest should demonstrate that development will not impact upon the purposes of designation;*
- *Proposals will need to demonstrate the potential benefits of the development to the host communities and identify opportunities for environmental enhancement;*

Schemes falling within landscape or nature designations will be considered where there are no alternatives and where a considerable community benefit is demonstrated and considered to outweigh the landscape impact ..."

Policy SP25 – Natural Environment

"Arun District Council will encourage and promote the conservation and enhancement of biodiversity and the natural environment through the development process and particularly through policies for the protection of both designated and non-designated sites. Where possible it shall also promote the creation of new areas for habitats and species. In relation to designated sites, development will be permitted where it protects sites listed in Tables 17.1-17.6 that are recognised for the species and habitats contained within them."

Policy DM31 – Designated Nature Sites

"It is the policy of the Council to maintain, protect and where possible enhance the conservation value of International, European, National and Local designated sites as listed in Tables 17.1 - 17.6. Development not directly connected with or necessary to the management of the designated site(s) and which is likely to have an adverse effect on the site(s), will generally not be permitted however such development may be permitted where any of the following can be demonstrated:

- *There is no alternative solution (which shall be adequately demonstrated by the developer) and*
- *There are reasons of public health or public safety or*
- *There are benefits of primary importance to the environment or*
- *There are imperative reasons of overriding public interest.*

Notwithstanding the above however, the presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined. Where development is permitted, the use of conditions or planning obligations will be used in order to avoid and minimise harm to the site(s). In any event, any adverse impacts shall be minimised and mitigated or compensated in full as agreed with the Planning Authority ..."

Policy DM36 – Development and Biodiversity

“Development schemes shall, in the first instance, seek to achieve a net gain in biodiversity and protect existing habitats on site. They shall also however incorporate elements of biodiversity including green walls, roofs, bat and bird boxes as well as landscape features minimising adverse impacts on existing habitats (whether designated or not). Development schemes shall also be appropriately designed to facilitate the emergence of new habitats through the creation of links between habitat areas and open spaces. Together, these provide a network of green spaces which serve to reconnect isolated sites and facilitate species movement.

Where there is evidence of a protected species on a proposed development site, planning applications shall include a detailed survey of the subject species, with details of measures to be incorporated into the development scheme to avoid loss of the species. This involves consideration of any impacts that will affect the species directly or indirectly, whether within the application site or in an area outside of the site, which may be indirectly affected by the proposals. All surveys shall be carried out at an appropriate time of year and shall be undertaken by a qualified and, where appropriate, suitably licensed person. All developments shall have regard to Natural England's standing advice for protected species ...”

Technical Guidance

- 1.18 Guidance is provided by Natural England in Technical Information Note 101 ‘Solar parks: maximising environmental benefits’, which states that: “...sites of lower existing biodiversity value may offer opportunities to deliver enhancement measures. These should be considered on a site by site basis and are likely to be most effective when they contribute to local biodiversity priorities identified through your local Biodiversity Action Plan.” (Natural England, 2011).

2.0 METHODS

- 2.1 The method for carrying out the preliminary ecological appraisal follows standard guidance published by the Chartered Institute for Ecology and Environmental Management (CIEEM, 2012).

Desk Study

- 2.2 A request was made to Sussex Biodiversity Record Centre (SBRC) in July 2013 for protected/notable species records and non-statutory designated sites within 1 km of the site.
- 2.3 The Multi-Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk) was accessed in July 2013 for records of statutory designated sites of biological interest.
- 2.4 Consideration has also been given to habitats and species listed under Section 41 of the NERC Act 2006 as being of Principal Importance for the purpose of conserving biodiversity.
- 2.5 The Sussex Biodiversity Action Plan was consulted to inform the identification of local priority habitats and species.

Field Survey

Extended Phase I Habitat Survey

- 2.6 An Extended Phase I Habitat survey (IEA, 1995) was conducted at the application site on Thursday 1 August 2013. The survey was carried out by an experienced ecologist who is a full member of CIEEM, employed by The Landmark Practice.
- 2.7 The Phase I Habitat survey method was developed by the Nature Conservancy Council to provide, relatively rapidly, a record of the semi-natural vegetation and wildlife habitat over large areas of the countryside. It is a classification based principally on vegetation, augmented by reference to topographical and substrate features. Habitats are mapped using standard colour codes, with further information provided by means of dominant species codes and descriptive target notes.
- 2.8 Extended Phase I, as described in the Institute of Environmental Assessment (now the Institute of Environmental Management and Assessment) in their *Guidelines for Baseline Ecological Assessment*, involves the collection of further information on habitat features of particular value to different ecological groups such as plants, fungi, lichens, mosses and faunal groups. The Extended Phase I Habitat survey forms the first stage of the ecological assessment of a site and is used to identify whether further, more detailed species-specific surveys are required.
- 2.9 Plant species nomenclature follows Stace (2010) and bird species nomenclature follows the British Ornithologists' Union (BOU) English vernacular names in The British List: A Checklist of Birds of Britain (8th edition). Mammal names follow Harris and Yalden (2008).

Survey Constraints

- 2.10 The survey was undertaken within the recognised survey season and all parts of the site could be accessed. There were no constraints associated with the survey work undertaken or assessment of results.

Evaluation

- 2.11 Please refer to **Appendix II** for ecological valuation techniques used in this report. Habitats and species identified within the application site, or those which may be affected by the proposed development, have been assigned preliminary ecological values on a scale between International value and 'Site' value³, in accordance with (IEEM, 2006).

³ The term 'site value' has been used rather than 'within the zone of influence only' recommended by IEEM, 2006. The term 'site' is considered to offer more clarity in a report context.

3.0 SURVEY RESULTS

Desk Study Results

Designated Sites

Bersted Brooks Local Nature Reserve (LNR)

- 3.1 The data search and information provided by SBRC established that the application site is not covered by any statutory or non-statutory designations. There is a single designated site within 1 km of the application site boundary (see **Figure 3**).
- 3.2 Bersted Brooks Local Nature Reserve is located 160 m south-east of the site. It supports meadows, ponds, reed beds and riverine woodland. In addition, the site is also known to support water vole.

Species

- 3.3 The data search returned a number of species records from within the 1 km search radius. Those considered relevant to the planning application are presented below.

Mammals

- Brown long-eared bat (*Plecotus auritus*)- 12 records, including roost records;
- Common pipistrelle (*Pipistrellus pipistrellus*)- 3 records, including roost records;
- Daubenton's bat (*Myotis daubentonii*)- 1 record;
- Grey long-eared bat (*Plecotus austriacus*)- 2 records;
- A long-eared bat (*Plecotus* sp.)- 5 records, including roost records;
- A Nyctalus bat (*Nyctalus* sp.)- 1 record;
- A pipistrelle bat (*Pipistrellus* sp.)- 37 records, including roost records;
- Serotine (*Eptesicus serotinus*)- 5 records, including roost records;
- Soprano pipistrelle (*Pipistrellus pygmaeus*)- 2 records, including roost records;
- An unidentified bat (*Chiroptera*)- 13 records, including roost records;
- A Whiskered bat (*Myotis mystacinus*)- 2 records;
- Otter (*Lutra lutra*)- 3 records between 2004 & 2005 from Aldingbourne Rife and Bersted Brooks LNR;
- Water vole (*Arvicola terrestris*)- 9 records between 1996 and 2012. In addition, water vole are known to breed at Bersted Brooks LNR ((Dee Christensen, Senior Community Parks Officer Arun District Council, pers. comm. 02.09.13);
- Brown hare (*Lepus europaeus*)- 2 records between 1999 and 2009; and
- No records were returned for badger (*Meles meles*) or hazel dormouse (*Muscardinus avellanarius*).

Birds

- 3.4 SBRC provided a range of notable bird records for the local area. Those that may potentially occur within the application site include barn owl (*Tyto alba*), bullfinch (*Pyrrhula pyrrhula*), lapwing (*Vanellus vanellus*), linnet (*Carduelis cannabina*), reed bunting (*Emberiza schoeniclus*), skylark (*Alauda arvensis*), song thrush (*Turdus philomelos*), starling (*Sturnus vulgaris*), corn bunting (*Emberiza calandra*) and yellowhammer (*Emberiza citrinella*).

Reptiles

- Adder (*Vipera berus*)- 1 record from 2011;
- Slow worm (*Anguis fragilis*)- 3 records between 1995 and 2012; and
- Grass snake (*Natrix natrix*)- have been recorded at Bersted Brooks LNR (Dee Christensen, Senior Community Parks Officer Arun District Council, pers. comm. 08.08.13)

Amphibians

- Great crested newt (*Triturus cristatus*)- 1 record from 2004, located approximately 970 m south-east of the site on Laurel Grove (a residential street in Bognor Regis).

Invertebrates

- 3.5 SBRC provided a range of rare insect records within 1 km of the site. None were considered relevant because the site does not offer suitable habitats for these species.

Plants

- 3.6 SBRC provided a range of rare plant records within 1 km of the site. None were considered relevant because the site does not offer suitable habitats for these species.

Field Survey Results

Habitats

- 3.7 The distribution of habitats located within the application site are shown on **Figure 2**, and photographs of the habitats present can be seen in **Appendix III**.

Arable

- 3.8 The site comprises two fields currently under arable cultivation. At the time of the survey Field 1 (to the south) was sown with wheat (*Triticum aestivum*) with flax (*Linum usitatissimum*) around the margins (**Photograph 1** refers), whilst field 2 (to the north) was being used for lettuce production with flax around the margins. The flax sward is thin, allowing other arable weed species to colonise. Species present include scentless mayweed (*Tripleurospermum inodorum*), fat-hen (*Chenopodium album*), shepherd's-purse (*Capsella bursa-pastoris*), common field speedwell (*Veronica persica*), common poppy (*Papaver rhoeas*), knotgrass (*Polygonum aviculare*), common fumitory (*Fumaria officinalis*), common centaury (*Centaureum erythraea*), red bartsia (*Odontites vernus*) and scarlet pimpernel (*Anagalis arvensis*).

Improved Grassland

- 3.9 A narrow strip (approximately 1.5 m wide) of improved grassland is present around the margins of the fields (**Photograph 1** refers). Species present include false oat-grass (*Arrhenatherum elatius*), cock's-foot (*Dactylis glomerata*), couch (*Elytrigia repens*), Yorkshire fog (*Holcus lanatus*) and creeping bent (*Agrostis stolonifera*).

Ditches

- 3.10 The fields are bounded by ditches, the majority of which are damp/dry (not holding much water). Species present in the channel include reed sweet-grass (*Glyceria maxima*) and water plantain (*Alisma plantago-aquatica*) (**Photograph 2** refers), on

the banks species present include common ragwort (*Senecio jacobaea*), hedge bindweed (*Calystegia sepium*), bittersweet (*Solanum dulcamara*), hogweed (*Heracleum sphondylium*), false oat-grass, common knapweed (*Centaurea nigra*), teasel (*Dipsacus fullonum*) and stinging nettle (*Urtica dioica*).

- 3.11 The ditch along the western boundary is likely to be permanently wet and is more species-rich, species present include common duckweed (*Lemna minor*), water plantain, fool's water-cress (*Apium nodiflorum*), hemlock water-dropwort (*Oenanthe crocata*), reed canary-grass (*Phalaris arundinacea*), bulrush (*Typha latifolia*), water-starwort (*Callitriche* sp.), meadow-sweet (*Filipendula ulmaria*), amphibious bistort (*Persicaria amphibia*), false fox-sedge (*Carex otrubae*), hard rush (*Juncus inflexus*) and filamentous algae (**Photograph 3** refers).

Hedgerows

- 3.12 Most of the fields are surrounded by defunct species-poor hedgerows (**Photograph 1** refers), species present include hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), hazel (*Corylus avellana*), alder (*Alnus glutinosa*) and bramble (*Rubus fruticosus*). Along the eastern boundary mature ash (*Fraxinus excelsior*), crack willow (*Salix fragilis*) and pedunculate oak (*Quercus rober*) trees are present.

Reservoir

- 3.13 A reservoir (labelled reservoir 2 on **Figure 2**), present along the western boundary of the site, is lined with a plastic liner, contains deep water and supports no aquatic vegetation. The banks of the reservoir support improved grassland; species present include false oat-grass, hogweed, willow saplings (*Salix* sp.), common knapweed, cock's-foot, common ragwort and fleabane (*Pulicaria dysenterica*).

Building

- 3.14 A building is present along the track which bisects the two arable fields (**Photograph 4** refers). The building is constructed of breeze blocks with a slight single pitched corrugated metal roof and wooden barge boards. It is believed this building is used as a pumping station.

Surrounding Land

- 3.15 The site is surrounded by farmland (both arable and pasture), woodland, hedgerows and ditches. Bersted Brooks LNR is located 160 m to the south-east.
- 3.16 A second reservoir is present outside the development footprint along the western boundary of the site (labelled reservoir 1 on **Figure 2**). It is similar in composition to reservoir 2. Four ponds are present around the perimeter of the site, which mostly (Ponds 1, 3 & 4) hold minimal water and support dense carpets of duckweed. Pond 2 (**Photograph 5** refers), however, supports a range of aquatic vegetation. Species present include water plantain, lesser pond sedge (*Carex acutiformis*), broad-leaved pondweed (*Potamogeton natans*), yellow iris (*Iris pseudacorus*) and water-starwort.
- 3.17 A small area of semi-natural broadleaved woodland lies adjacent to the north-west corner of the site (surrounding ponds 2 and 3). This area comprises pedunculate oak trees with hazel coppice stools and elder (*Sambucus nigra*) in the understorey. Ground flora species include hart's tongue fern (*Phyllitis scolopendrium*) and dog's mercury (*Mercurialis perennis*).

- 3.18 Adjacent to the north-western corner of the site is an area of unimproved neutral grassland. Species present include common knapweed, devil's-bit scabious (*Succisa pratensis*), ox-eye daisy (*Leucanthemum vulgare*) and self-heal (*Prunella vulgaris*).

Species

Bats

- 3.19 The mature trees along the southern and eastern boundaries and the building could provide potential roosting habitat for bats. The boundary habitats, such as the hedgerows and ditches, are likely to support foraging and commuting bats.

Badger

- 3.20 No evidence of badger activity was recorded in the development footprint during the field survey. An outlier badger sett was identified in the woodland to the north-west of the site (located approximately 20 m west of the development footprint). Some debris (e.g. dead wood and leaf litter) was present in the opening indicating the sett had not recently been used. Several small mammal tracks were present along the western perimeter of the site, these were attributable to rabbits (given their small size and the presence of rabbit droppings).

Hazel Dormouse

- 3.21 Although the site supports several hedgerows, many of them are defunct, only forming tenuous links with other hedgerows, scrub and woodland habitat within the wider landscape. Only a small amount of hazel was present in the hedgerows, a key food source for hazel dormice. However other fruit bearing species were present such as blackthorn, hawthorn, dog-rose (*Rosa canina*) and bramble which could be utilised by dormice if present. The site also lacks mature species-rich hedgerows, which hazel dormice are known to prefer.

Otter and Water Vole

- 3.22 The ditches within the site that continuously hold water may potentially support otter and water vole, although no evidence of these species was noted during the survey. Most of the ditches held minimal water and lacked emergent vegetation.

Other Mammals

- 3.23 During the field survey, deer tracks attributable to roe deer (*Capreolus capreolus*) were noted along the field margins.

Birds

- 3.24 Incidental bird species recorded during the walkover survey were common buzzard (*Buteo buteo*), little egret (*Egretta garzetta*), black-headed gull (*Chroicocephalus ridibundus*), lesser black-backed gull (*Larus fuscus*), magpie (*Pica pica*), greater spotted woodpecker (*Dendrocopos major*) and wood pigeon (*Columba palumbus*).
- 3.25 The hedgerows within the application site offer suitable habitat for nesting farmland birds and year round foraging opportunities.

Amphibians and Reptiles

- 3.26 The field margins, hedgerow, ditches and ponds may offer suitable habitat for foraging reptiles. These are likely to be the more common reptile species, particularly grass snake (*Natrix natrix*) given the many water bodies both on site and in the wider

landscape. Potential overwintering habitat is also present, in the form of the earth bunds surrounding the reservoirs.

- 3.27 The boundary habitats offer suitable foraging, commuting and overwintering terrestrial habitat for amphibians. The ponds, as well as the wet ditches, could provide suitable breeding habitat for amphibians (potentially including great crested newts). The ponds on the site boundaries were assessed for their potential to hold great crested newts using the Habitat Suitability Index method (see **Table 1** below).

Table 1: HSI Score

Factor	Pond 1		Pond 2		Pond 3		Pond 4	
Location	A	1.00	A	1.00	A	1.00	A	1.00
Pond area	140	0.28	140	0.28	100	0.20	120	0.24
Pond drying	Frequently	0.10	Rarely	1.00	Frequently	0.10	Frequently	0.10
Water quality	Moderate	0.67	Good	1.00	Moderate	0.67	Moderate	0.67
Shade	50	1.00	40	1.00	100	0.20	100	0.20
Fowl	Minor	0.67	Minor	0.67	Minor	0.67	Minor	0.67
Fish	Minor	0.33	Absent	1.00	Absent	1.00	Possible	0.67
Ponds	4	1.00	3	1.00	3	1.00	2	0.84
Terrestrial habitat	Poor	0.33	Moderate	0.67	Moderate	0.67	Moderate	0.67
Macrophytes	0	0.31	30	0.61	0	0.31	2	0.33
Score	Poor	0.46	Good	0.77	Poor	0.45	Poor	0.44

- 3.28 The ditches are likely to represent sub-optimal habitat for great crested newts due to a range of constraining factors including: overshadowing, limited aquatic vegetation, water quality, water flow, likely desiccation and potential for fish populations.

Invertebrates

- 3.29 Incidental insect species recorded during the walkover survey include large white (*Pieris brassicae*), small blue (*Cupido minimus*), painted lady (*Vanessa cardui*), peacock (*Inachis io*), meadow brown (*Maniola jurtina*), brimstone (*Gonepteryx rhamni*), common blue damselfly (*Enallagma cyathigerum*), broad-bodied chaser (*Libellula depressa*), large red damselfly (*Pyrrhosoma nymphula*) and emperor dragonfly (*Anax imperator*). The arable fields offer limited value to invertebrates due to the lack of flowering plants and the likely application of pesticides. The hedgerows and ditches offer more suitable habitat and are likely to support breeding and sheltering (including overwintering) invertebrates.

4.0 DISCUSSION AND EVALUATION

Evaluation of Habitats

- 4.1 Habitats identified within the study area have been assigned ecological values on a scale between International value and 'Site' value. Examples of the resources that were consulted in defining such ecological values are given in **Appendix II**. Only the habitats considered to have ecological value are evaluated here. The arable fields, improved grassland and building are considered to have negligible value and are not considered further.

Ditches and Hedgerows

- 4.2 Although the hedgerows are species-poor with limited connectivity to other similar habitat, they are nonetheless likely to be used as wildlife corridors by bats, small mammals, birds, reptiles, amphibians and invertebrates.

- 4.3 The ditches add structure and diversity to the range of habitats available within the site and support a greater range of flora, invertebrates and, potentially, amphibians.

Ecological value: **local**

Reservoir

Both the reservoir within the site and the reservoir adjacent to the site boundary, are unlikely to support significant populations of breeding amphibians due to the lack of macrophyte cover and frequent disturbance by gulls. The earth bunds surrounding the reservoirs could support basking and overwintering reptiles and amphibians.

Ecological value: **site** (only in context of earth bunds)

Surrounding Land

- 4.4 Habitats immediately bounding the application site (the ponds, woodland and semi-improved grassland) are likely to support a range of protected/notable wildlife including bats, badger, brown hare, farmland birds, reptiles, amphibians and invertebrates.

- 4.5 Bersted Brooks LNR lies to the south-east of the site and supports rare mammal species.

Ecological value: from **site to district**

Evaluation of Species

Bats

- 4.6 The mature trees within the application site boundary had cracks and splits that could be used by roosting bats.

- 4.7 The building present within the site offered low bat roost potential. The building was generally well-sealed and the corrugated metal roof would offer poor thermal insulation properties (however, gaps are present around the pipes that enter the base of the building allowing access into the interior). An internal inspection found no evidence for bats, rat droppings and cobwebs were recorded, all suggesting no recent access.

- 4.8 The arable fields offer limited foraging opportunities for bats. Foraging and commuting activity is likely to be restricted to the margins of the site.

Ecological value: **site**, in the context of the arable fields; the hedgerows are likely to be of higher value for bats (further surveys would be required to establish this).

Badger

- 4.9 Evidence of badger activity (in the form of an outlier sett) was found just outside the development footprint. Arable fields generally provide poor foraging opportunities for badgers, however, seasonal opportunities may be available depending on the cropping regime e.g. maize and cereals. The hedgerows will provide seasonal foraging opportunities in the form of fruits.

Ecological value: **site**

Hazel Dormouse

- 4.10 No hazel dormouse records were returned in the data search. This species requires species-rich woodland/hedgerows/scrub to ensure a continuous source of food is available throughout the seasons (Bright & Morris, 1989). They rarely range further than 70 m from their nests, so require this habitat diversity within a small area (English Nature, 2006). Since the dormouse is an arboreal species it also requires a continuous shrub/tree network and will rarely cross open ground. In view of such requirements, the habitats were considered sub-optimal for dormice.

Ecological value: unlikely to be present

Otter and Water Vole

- 4.11 Most of the ditches were deemed unsuitable for water vole due to the lack of water, which would make this species extremely vulnerable to predation by mink. The continuously wet ditch, however, could potentially support both otter and water vole.

Ecological value: **local**

Other Mammals

- 4.12 The application site may be accessed by species such as fox, brown hare and European hedgehog for foraging and shelter.

Ecological value: **site**

Birds

- 4.13 The hedgerows offer nesting, shelter and foraging potential to a range of bird species. The arable fields have the potential to support ground nesting birds, such opportunities would be limited due to regular disturbance by farm machinery

Ecological value: **site**

Reptiles and Amphibians

- 4.14 The arable field offers very limited habitat potential to these species groups because it is regularly disturbed (ploughing would destroy burrows that could be used by sheltering newts). The use of pesticides would reduce prey availability, and there is evidence they can be toxic to amphibians. They may, however, be used by species to cross between more suitable habitats and could offer some foraging potential at certain times of year. The margins, hedgerows, ponds and ditches offer suitable foraging habitat.

- 4.15 The ditches are likely to represent sub-optimal habitat for great crested newts (GCN) (**Paragraph 3.28** refers). Ponds 1, 3 & 4 are unlikely to support breeding amphibians; the fact they are fed by ditches would mean fish, which will predate GCN larvae, are likely to be present. This is reinforced by the fact all of the ponds HSI scores were <0.5, which would indicate poor suitability for newts.

- 4.16 Pond 2 is more likely to support amphibians, its HSI score was 0.77 which would indicate good suitability for newts. Since good quality terrestrial habitat is available immediately north and west of the pond it is considered likely newt activity will be focused in this area. However, great crested newts (if present) may cross the arable fields to reach for suitable habitat. Although there are few records for this species in the wider landscape, the presence of GCN cannot be ruled out.

Ecological value: from **site to local** (if GCN present)

Invertebrates

- 4.17 The arable field offers very limited habitat potential to invertebrates due to the lack of flowering plants and treatment with pesticides. The hedgerows, ditches and ponds offer greater potential for breeding, foraging and sheltering invertebrates. No habitats of particular importance to invertebrates were identified.

Ecological value: **site**

Overall Evaluation

- 4.18 The application site is small in size and is not particularly diverse in terms of habitats present. The ditches and hedgerows are considered to be the most important ecological features within the site.

Ecological value: the majority of habitats/species are of **site** value, whilst Bersted Brooks LNR is of **district** value.

Summary Table

- 4.19 **Table 2** below provides a summary of the ecological values assigned to habitats and species actually or potentially relating to the application site. Habitats considered to have negligible ecological value have not been included.

Table 2: Summary of Ecological Evaluation

Habitat/species	Ecological value
Ditches and hedgerows	Local
Reservoir	Site (in context of bunds)
Surrounding land	Local to District (Bersted Brooks LNR)
Bats	Site (for arable fields)
Badger	Site
Hazel dormouse	Unlikely to be present
Otter and water vole	Local (if present)
Other mammals	Site
Birds	Site
Reptiles and amphibians	Site to Local (for GCN)
Invertebrates	Site
Overall	Site

5.0 LEGAL AND LOCAL BIODIVERSITY ACTION PLAN (LBAP) CONSIDERATIONS

- 5.1 The application site is not subject to any statutory or non-statutory nature conservation designations.
- 5.2 The following legally protected species have been identified as occurring, or potentially occurring, within or directly adjacent to the site:
- Badger;
 - Bats;
 - Otter;
 - Water vole;
 - Breeding birds;
 - Reptiles; and
 - Great crested newt.
- 5.3 These species are afforded protection under either European and/or domestic legislation, including the Conservation of Habitats and Species Regulations 2010 (as amended), the Wildlife and Countryside Act, 1981 and the Protection of Badgers Act 1992.
- 5.4 **Table 3** below details the habitats and species relevant or potentially relevant to the application site that are listed in Section 41 of the NERC Act (HMSO, 2006) as being of principal importance in England and listed as habitat/species under the local BAP.
- 5.5 Under the NERC Act (2006) the Government has a duty to take reasonably practicable steps to further the conservation of the living organisms and habitats that are included in lists published under Section 41. It is also the responsibility of the Local Planning Authority to regard Section 41 species as a material consideration in planning proposals.

Table 3: Section 41 of the NERC Act, 2006, and LBAP habitats and species actually or potentially relating to the site

Habitats/Species within the site	S41	Sussex BAP
Arable field margins	Y	Y
Ditches	Y	Y
Hedgerows	Y	Y
Ponds	Y	Y
Certain bat species	Y	Y
Brown hare	Y	Y
European hedgehog	Y	
Otter	Y	Y
Water vole	Y	Y
Barn owl, linnet, skylark, song thrush, yellowhammer and lapwing	Y	Y (barn owl, skylark & song thrush)
Slow worm and grass snake	Y	
Great crested newt	Y	Y
Common toad (<i>Bufo bufo</i>)	Y	

- 5.6 In order to address legal and planning requirements, the above species are further considered below in addition to the ecologically valuable species identified at Section 4.0.

6.0 ASSESSMENT OF IMPACTS

- 6.1 Assessment of the likely impacts (both beneficial and adverse) of the proposed development on habitats and wildlife species (ecological receptors) are described below. Measures are recommended in **Section 7.0**, in accordance with national and local planning policy and wildlife legislation, to avoid and (where necessary) mitigate against or compensate for negative impacts.

Habitats

- 6.2 The application scheme has been designed to avoid the majority of potential ecological impacts by confining development to the interior of the site. The hedgerows and ditches should be protected by the creation of a 'wildlife protection zone', to be approximately 8 m in width. This will act as both a buffer to adjacent habitats and to allow vehicle access for ongoing maintenance of the hedgerows and ditches.
- 6.3 The roots of hedgerows and trees could be damaged during construction of the transformer/inverter buildings. Digging of the trenches for the installation of electrical cabling could also damage trees and hedgerows.
- 6.4 To prevent shading of the solar panels the hedgerows should be cut on a rotational basis every three years. This management will potentially prolong their functional life by encouraging re-growth.
- 6.5 For the lifetime of the proposed solar park, the fields will be taken out of their normal cycle of arable production and converted to permanent pasture.
- 6.6 Apart from the ditches maintained by the IDB, the other drainage ditches should be cleared every 2 – 3 years, to ensure their effective drainage function.

Bats

- 6.7 Bats could be disturbed by the delivery and installation of materials.
- 6.8 Retention of existing hedgerows will retain foraging/commuting habitats for bat species. Infilling of existing hedgerows to increase diversity of structure and species, coupled with management sensitive to wildlife, will provide long-term habitat enhancements. This will result in an overall positive impact upon bat species which may utilise features within the application site.
- 6.9 Either livestock grazing or mowing/cutting will be used as a management regime for the grassland surrounding the panels during the operation of the solar park. If sheep grazing is used for grassland management, the associated dung will attract some invertebrates which will marginally increase the foraging opportunities available to bats.

Badger

- 6.10 Badgers could be disturbed by the delivery and installation of materials.
- 6.11 Badgers are present in the wider landscape and so it is likely that they periodically utilise the site for foraging. During construction there is a risk that badgers and other wildlife could fall into open trenches, resulting in injury or death. The erection of the PV panels will result in a small loss of foraging habitat. The security fence could exclude badgers from the application site, depriving them of foraging habitat.
- 6.12 The additional hedgerow planting and sensitive management of the hedgerow network within the application site will benefit badgers by enhancing seasonal foraging opportunities (i.e. fruit and berries).

Otter and Water Vole

- 6.13 The inclusion of a wildlife protection zone between the security fence and hedgerow/drainage ditches will both minimise the risk of disturbance to any wildlife, such as otter and water vole which may be using the ditches, and provide enhanced habitat in the longer term.

Birds

- 6.14 Construction activities have the potential to result in disturbance to foraging and nesting bird species. The erection of PV panels will result in the loss of habitat for ground nesting birds (if present) as well as foraging habitat for overwintering farmland birds. Sensitive habitat management of existing and newly created habitats could result in improvements to nesting and foraging habitat within the site.

Reptiles

- 6.15 Reptiles could be disturbed by the delivery and installation of materials.
- 6.16 Should reptiles be present within the application site it is likely they are mainly using the boundary habitats (field margins, hedgerows, banks and ditches). These features will be retained, protected during the construction and operational phases of development and enhanced through landscape planting. This approach will avoid the majority of impacts on this species group.

Amphibians

- 6.17 Amphibians could be disturbed by the delivery and installation of materials.
- 6.18 Should great crested newts be present within the site, they are likely to be predominantly utilising the boundary habitats which will be retained and protected minimising potential impacts on newts. If present, however, their presence within the fields cannot be ruled out, and newts could potentially be harmed when the panels are installed.
- 6.19 The reduction in inputs of artificial fertilisers during operation of the solar park will result in a decrease in nutrient runoff and the resulting eutrophication of adjacent waterbodies and ditches. Over time and in conjunction with sensitive management, the condition of these features is likely to improve and, therefore, offer improved conditions for amphibians and other aquatic species.

Invertebrates

- 6.20 The retention, protection and sensitive management of boundary habitats, new hedgerow planting and reduction in inputs of artificial fertilisers (and consequently nutrient runoff and the resulting eutrophication of adjacent waterbodies and ditches), will prove beneficial for invertebrates, particularly aquatic species.

Summary of Potential Impacts

- 6.21 **Table 4** below provides a summary of the potential impacts on ecological receptors (in the absence of mitigation) as a result of the development proposals.

Table 4: Summary of potential impacts on ecological receptors

Site preparation and construction phase	Ecological receptor (<i>positive impacts are highlighted in italics</i>)
Retention of boundary habitats and creation of buffer habitat (wildlife protection zone) and landscape planting to mitigate landscape and visual impacts	<i>Hedgerows, trees, bats, badgers, otter, water vole, other mammals, birds, reptiles, amphibians and invertebrates.</i>
Root damage during construction of transformer/inverter buildings	Hedgerows and trees
Digging of trenches for installation of electrical cabling	Hedgerows, trees, badger, breeding birds, common reptiles and amphibians
Short-term disturbance during delivery and installation of materials	Badger (foraging), birds, reptiles, amphibians and potentially bats
Operational phase	Ecological receptor (<i>positive impacts are highlighted in italics</i>)
The reduction or cessation of artificial fertiliser use and associated run-off	<i>Hedgerows, trees and ditches. Bats, birds, amphibians, reptiles and invertebrates via enhanced foraging.</i>
Regular (sensitive) management of hedgerows and trees to prevent overgrowth and panel shading	<i>Hedgerows and trees, bats, badger, small mammals, birds, amphibians, reptiles and invertebrates.</i>
Loss of low quality foraging habitat due to displacement by PV panels	Badger
Creation of permanent pasture around PV panels	<i>Birds</i>

7.0 RECOMMENDATIONS

- 7.1 The following recommendations for ecological mitigation and compensation measures for the application site are in accordance with guidance set out in the National Planning Policy Framework (NPPF), which sets out the policies on the protection of biodiversity through the planning system. This requires that, in determining planning applications, a Local Planning Authority should secure measures to firstly avoid, then mitigate against or compensate for ecological harm, and also seek ways to enhance and restore biodiversity.
- 7.2 The measures discussed below address the requirements for mitigation and compensation for development activities within the application site. Where full detail of installation activities is not known, a precautionary approach has been adopted and appropriate measures recommended. Works required outside the site boundary to connect the development to the National Grid will be undertaken in accordance with permitted development rights enjoyed by the electricity distribution network operator and in accordance with its duties under Schedule 9, sub section (1) of the Electricity Act 1989⁴.
- 7.3 An 8 m wide wildlife protection zone will be created around the perimeter of the construction zone/field boundaries. This will ensure there are no adverse impacts on the mature trees located along the north-eastern boundary, as their root zones will be protected.

Avoidance, Mitigation and Compensation Measures

Sensitive habitats

- 7.4 All sensitive habitats within and bounding the application site (*i.e.* the unimproved grassland, hedgerows, trees, woodland and ditches) should be retained and protected using permanent robust security fencing during the construction and operational phases of development. A safe working distance of at least 12 m (*i.e.* the 8 m wide wildlife buffer habitat and the approximate 4 m wide distance between the security fence and panels) should be maintained between the erection of PV panels and adjacent habitats.
- 7.5 All access to the site should use existing access roads and field entrances, thereby also avoiding any loss of hedgerow/ditch habitat.

Bats, Otter and Water Vole

- 7.6 The measures described in **Section 6.0** above will retain and protect any potential bat roosts in trees, otter and water vole habitat from damage or deterioration. Water vole burrows are known to extend up to 5 m into banks, so the wildlife protection zone will ensure this habitat is protected and buffered from adverse impacts. All

⁴ (1) In formulating any relevant proposals, a license holder or a person authorised by exemption to generate, transmit, distribute or supply electricity-

(a) Shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and

(b) Shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on such flora, fauna, features, sites, buildings or objects.

potential nesting, foraging and commuting habitat should also be retained and enhanced through sensitive habitat management.

- 7.7 No artificial night-time lighting should be permitted within the application site during operation of the solar park. Lighting during the construction phase will be avoided as far as practicable. This will avoid any associated negative impacts on foraging/commuting bats and otter.

Badger (and Other Mammals)

- 7.8 During the construction phase, any trenches created within the application site should not be left open overnight or should be fitted with a rough sawn plank to provide a means of escape should a badger or other animal fall in. No lighting or night-time working should occur during operation, to avoid any potential disturbance of badgers foraging within the area.
- 7.9 In order to prevent exclusion of foraging badgers and other mammals from the application site during the operational phase, a panel should be lifted every 100 m or mammal gates (20 cm x 20 cm) should be created in the security fence (preferably at existing runs/paths).
- 7.10 An existing track lies east-west and effectively splits the site into two separate sections. To allow deer to continue to pass through the site, this access route will be maintained.

Birds

- 7.11 To avoid potential impacts on amphibians and reptiles, it is recommended that the panels be installed during the winter (see below). This will also avoid disturbance to nesting birds and accidental damage to nests. The arable fields are seeded in the autumn, so no cereal stubble is left over the winter, consequently there will be no loss of winter foraging for farmland birds.
- 7.12 To minimise disturbance and accidental damage, no heavy machinery will operate within the wildlife protection zone during the construction phase of the development.
- 7.13 Any future hedgerow management should be undertaken outside the breeding bird season (usually March to July but seasonally variable).

Amphibians and Reptiles

- 7.14 Although the arable fields offer limited hibernation potential to great crested newts, they could still be crossed by amphibians to reach more suitable habitat and they may offer seasonal foraging opportunities. To avoid potential impacts on amphibians (potentially including great crested newts) and reptiles, the panels should be erected during the winter when these species will be hibernating within the boundary habitats/adjacent woodland habitat and therefore will not be impacted by the proposed development.

Invertebrates

- 7.15 No avoidance, mitigation or compensation measures are required with regards to invertebrates.

8.0 ECOLOGICAL ENHANCEMENTS

- 8.1 The following recommendations for ecological enhancement of the application site are in accordance with planning policy, whereby a key principle is a requirement for the local planning authority, in determining planning applications, to seek ways to enhance and restore biodiversity.
- 8.2 The following ecological enhancements of the application site are recommended:
- The wildlife protection zone is to be seeded with a wildflower mixture, which will provide enhancement for a range of species including basking/sheltering/foraging reptiles, water vole, bats, badger, birds, potentially otter, amphibians and invertebrates. The grassland is to be grazed or mown/cut rotationally, with half the grassland cut/grazed in late June, then the remainder of the grassland is to be cut/grazed in September. This will provide the opportunity for all wildflowers to set seed;
 - The gappy hedgerows along the boundaries should be planted up, using species of a similar composition to Bersted Brooks LNR (namely hawthorn, blackthorn, dog-rose, black poplar (*Populus nigra*), alder, grey willow (*Salix cinerea*) and goat willow (*Salix caprea*). This will represent a positive impact on a range of associated wildlife and will enhance continuity of the hedgerow network within and beyond the application site;
 - Installation of two bat and two bird boxes will increase roosting/nesting opportunities available for these species;
 - Decrease of inputs of artificial fertilisers and pesticides will reduce the subsequent pollution of drainage ditches and adjacent waterbodies and other habitats. This has the potential to result in an increase in species diversity and habitat quality within these habitats;
 - An interpretation board to be installed in the grass margin to act as an educational resource describing the wildlife present on the site. The sensitivity of the species within the wildlife protection zone will be emphasised to discourage frequent public access; and
 - A landscape management plan to be prepared and implemented to cover the management of the retained and enhanced habitats such as the hedgerow and ditches.
- 8.3 In addition, following consultation with the Friends of Bersted Brooks, the applicant proposes to support habitat improvement works in the nearby Bersted Brooks LNR. The works identified by the Friends as requiring support include excavating the existing ponds to increase their capacity and the installation of dipping platforms which can be used as an educational resource.

9.0 CONCLUSION

- 9.1 Subject to implementation of the mitigation, compensation and enhancement measures discussed above, the proposed development is capable of being accommodated without significant negative impacts on ecologically sensitive receptors within the survey area.
- 9.2 The enhancement measures proposed are likely to result in a range of benefits to the ecology of the local area, particularly through implementation of a dedicated, sensitive and appropriate management regime of habitats and features within the application site boundaries.

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FIGURES



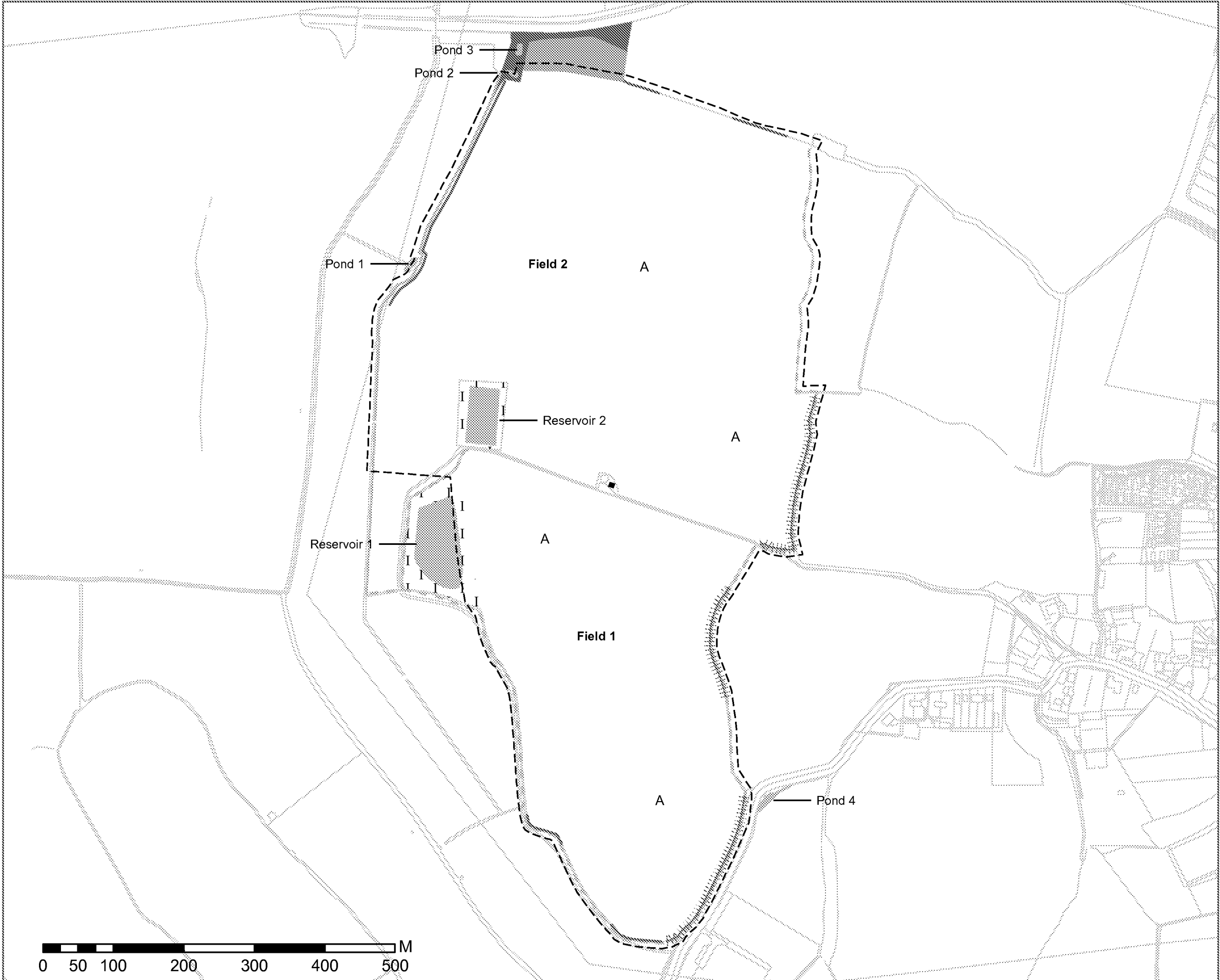
Site location

SHRIPNEY
SOLAR PARK

FIGURE 1
Site location

THE
Landmark
PRACTICE

Hope Chapel House Hope Chapel Hill
Hotwells Bristol BS8 4ND
Tel: 0117 923 0455 Fax: 0117 9253702
www.thelandmarkpractice.com



- Survey area
- Species-poor hedge with trees
- Wet ditch
- Dry ditch
- Intact species-poor hedge
- Unimproved neutral grassland
- Water body
- Broadleaved semi-natural woodland
- A Arable
- I Improved grassland

SHRIPNEY
SOLAR PARK

FIGURE 2
Extended Phase 1 Habitat survey



Hope Chapel House Hope Chapel Hill
Hotwells Bristol BS8 4ND
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APPENDIX I

LEGAL CONTEXT

APPENDIX I: LEGAL FRAMEWORK

1.0 PROTECTED SITES (EUROPEAN)

1.1 *Special Areas of Conservation (SACs)*

SACs are designated under **The Conservation of Habitats and Species Regulations 2010** ('2010 Regulations') (as amended) which implements **The European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora** 92/43/EEC (the 'Habitats Directive', EEC, 1992). Lists of candidate SACs (cSACs) have been submitted to the European Commission for approval. Both possible SACs (pSACs) and cSACs are treated by the planning system as if fully designated.

The Habitats Directive also refers to the need for nature conservation outside protected areas (Article 10) and measures to implement this article are incorporated in British legislation through the Habitats Regulations (HMSO, 1994) and ODPM Circular 06/2005 that accompanies PPS9. Article 10 of The EU Habitats Directive 1992 states that:

'Member States shall endeavour, where they consider it necessary, in their land use planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild flora and fauna.'

Article 10 of The EU Habitats Directive 1992 (and Regulation 39(3) of the Conservation (Natural Habitats, & c. Regulations) 2010 goes on to state:

"The features of the landscape referred to in paragraphs (1) and (2) are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems of marking field boundaries) or their function as "stepping stones" (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species." 39(3)

1.2 *Special Protection Areas (SPAs)*

SPAs are classified in accordance with the **European Community Directive on the Conservation of Wild Birds** (79/409/EEC) (the 'Birds Directive', EEC, 1979). Under this Directive, the UK Government must also take special measures to conserve the habitat of species listed in Annex I of the Directive and all migratory species. The provisions of the Birds Directive are implemented in England through the Wildlife and Countryside Act 1981 (as amended) and the Habitats Regulations (2010).

1.3 *Ramsar sites*

The Ramsar Convention (UNESCO, 1987) requires signatory states to protect wetlands that are of international importance, particularly as waterfowl habitats.

2.0 PROTECTED SITES (NATIONAL)

2.1 *Sites of Special Scientific Interest (SSSIs)*

The **Wildlife and Countryside Act 1981** (as amended 1991 and varied 1998) (HMSO, 1981, 1991, 1998) requires Natural England, the Government body with authority for nature conservation in England, to designate areas which make a significant contribution to a national network of sites of nature conservation value as SSSIs.

The **Countryside and Rights of Way Act 2000** (HMSO, 2000) came into force in full on 30 January 2001. The Act is in five parts. Part III relates to Nature Conservation and amends existing legislation (i.e. the Wildlife and Countryside Act 1981) through improved protection and management of SSSIs, improved legal protection for threatened species and the provision of a statutory basis for biodiversity conservation.

2.2 *Local Nature Reserves*

Local Nature Reserves are designated under Section 21 of **The National Parks and Access to the Countryside Act 1949** (HMSO, 1949) by principal local authorities. The declaring local authority must have a legal interest in the land concerned. Local Nature reserves are designated for people and wildlife. They are places with wildlife or geological features of special interest locally and that give people special opportunities to study and learn about them or simply enjoy them and have contact with nature.

3.0 NON-STATUTORY SITES

The majority of Local Authorities have a system of 'second tier' sites which do not wholly fulfil SSSI designation criteria, but which are, nonetheless, of local or regional value. The policies, encouraged by Government advice, recognise that protection should be extended beyond the statutory sites to include the best examples of wildlife habitats, populations of rare species and geological features remaining in the area and are particularly valuable in supplementing and supporting the national framework for SSSIs.

4.0 PROTECTED FEATURES

4.1 *Hedgerow Regulations*

The **Hedgerow Regulations 1997** (HMSO, 1997) were introduced to protect 'important' hedgerows in the countryside by controlling their removal through a system of notification. The Regulations apply to lengths of hedgerow greater than 20m in length, not adjoining residential curtilages. 'Important' hedgerows are defined within the Regulations on a variety of historical and/or ecological criteria.

4.2 *Tree Preservation Orders (TPOs)*

TPOs are made under the Town and Country Planning (Tree Preservation) (England) Regulations 2012. They are made by local planning authorities to protect selected trees and woodlands if their removal would have a significant impact on the local environment and its enjoyment by the public. The criteria do not incorporate any specific considerations of ecological value. TPOs, however, provide legal protection

to trees prohibiting the cutting down, uprooting, topping, lopping, wilful damage or wilful destruction.

5.0 PROTECTED SPECIES (EUROPEAN)

5.1 *Plants*

Certain plant species are listed under Annex IVb of the Habitats Directive under which it is an offence to deliberately pick, collect, cut, uproot or destroy such a plant.

Under the Bern Convention 1979, Contracting Parties are required to take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild flora species specified in Appendix 1. In the UK this is implemented through various national wildlife protection policies.

5.2 *Bats*

All British bats and their roosts are fully protected under international wildlife law against adverse effects including disturbance. Under the terms of the Bonn Convention, which encompasses the Agreement of the Conservation of Bats in Europe, there is a fundamental obligation to protect from damage or disturbance, sites which are important for the conservation status of bats. Such sites include those bats use for shelter or protection and important foraging areas.

5.3 *Dormouse (*Muscardinus avellanarius*)*

The dormouse is protected under Schedule 2 of the Habitats Regulations 2010 and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Taken together, the Regulations and Act make it illegal to intentionally or deliberately kill, injure or capture dormice; deliberately disturb dormice and damage or destroy dormouse breeding sites or resting places.

5.4 *Otter (*Lutra lutra*)*

The otter is protected under Schedule 2 of the Habitats Regulations 2010 and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Taken together, the Regulations and Act make it illegal to intentionally or deliberately kill, injure or capture otters; deliberately disturb otters and damage or destroy otter breeding sites or resting places.

5.5 *Birds*

In Britain all wild birds are granted legal protection under the EC Birds Directive and the Wildlife & Countryside Act 1981 (as amended). This legislation protects the birds, their eggs and nests whilst being built or in use.

Legal protection makes it an offence to intentionally kill, injure, take or have in possession any wild bird or egg. It is also an offence to intentionally damage or destroy the nest of any wild bird whilst it is being built or in use.

Under the Bern Convention 1979, Contracting Parties are required to take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II. In the UK this is implemented through various national wildlife protection policies.

5.6 Great crested newt (*Triturus cristatus*)

The great crested newt is fully protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010. The legislation protects the newts and their places of shelter or protection, which may extend 500m from the breeding pond.

5.7 Invertebrates

Under the Conservation of Habitats and Species Regulations 2010, invertebrate species listed on Schedule 2 it is an offence to deliberately capture or kill, disturb, take or destroy eggs of such a species or to damage or destroy the breeding site or resting place of such an animal.

6.0 PROTECTED SPECIES (NATIONAL)

6.1 Plants

Statutory protection in Great Britain is provided by the Wildlife and Countryside Act 1981. The plants and fungi which have special protection are listed on Schedule 8 under which it is an offence to intentionally pick, uproot or destroy any plant on Schedule 8.

Five plant species are listed on the Weeds Act 1959 as injurious: common ragwort (*Senecio jacobaea*), broad-leaved dock (*Rumex obtusifolius*), curled dock (*Rumex crispus*), creeping thistle (*Cirsium arvense*) and spear thistle (*Cirsium vulgare*). The Act requires landowners to eliminate scheduled weeds to prevent their seeds contaminating neighbouring land. The Ragwort Control Act 2003 amends the Weed Act with respect to common ragwort.

Thirty-eight species plus all species of *Elodea* (of which there are currently three species known to have been introduced) are listed on Schedule 9 of the Wildlife and Countryside Act 1981 under which it is an offence to plant or otherwise cause to grow in the wild the scheduled species. Two are marine, thirteen (plus all species of *Elodea*) aquatic and the remainder terrestrial.

6.2 Wild Mammals

Under the Wild Mammals (Protection) Act 1996 it is an offence to mutilate, kick, beat, nail or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering.

6.3 Badgers

Badgers are protected under the Protection of Badgers Act 1992. This Act makes it illegal to wilfully kill, injure or take any badger, or attempt to do so and it is an offence to intentionally or recklessly damage, destroy or obstruct access to any part of a badger sett or disturb a badger when it is occupying a sett.

6.4 Water Voles

The water vole (*Arvicola amphibius*) receives protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under the Act it is an offence to intentionally kill, injure or take water voles and intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection or

obstruct access to any structure or place used by water voles for shelter or protection or to disturb water voles while they are using such a place.

6.5 Birds

In Britain all wild birds are granted legal protection under the Wildlife & Countryside Act 1981 (as amended) and the EC Birds Directive. This legislation protects the birds, their eggs and nests whilst being built or in use.

Legal protection makes it an offence to intentionally kill, injure, take or have in possession any wild bird or egg. It is also an offence to intentionally damage or destroy the nest of any wild bird whilst it is being built or in use. Birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) are subject to special penalties and are also protected from disturbance while nesting including the disturbance of dependent young.

6.6 Reptiles

The slow-worm (*Anguis fragilis*), grass snake (*Natrix natrix*), adder (*Vipera berus*) and common lizard (*Lacerta vivipara*) are protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) in respect of section 9(1) and 9(5) only. Under section 9(1) it is an offence to knowingly kill or injure a reptile. Section 9(5) refers to sale and trade.

6.7 Invertebrates

Statutory protection in Great Britain is provided by the Wildlife and Countryside Act 1981. The invertebrates which have special protection are listed on Schedule 5 under which it is an offence to intentionally kill, injure or take these invertebrates and intentionally or recklessly damage or destroy, or obstruct access to, any structure or place used for shelter or protection or disturb any such animal while occupying such a structure or place.

7.0 BIODIVERSITY CONSERVATION

In 2002, the Department of Farming and Rural Affairs (DEFRA) published a list of principally important species and habitats for the purposes of conserving biological diversity in England under Section 74 of the Countryside and Rights of Way Act 2000 in accordance with the 1992 UN Convention on Biological Diversity. This has subsequently been carried forward under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. *Biodiversity 2020: A strategy for England's wildlife and ecosystem services* sets out the means by which the Government will comply with its duty under Section 41 of the NERC Act to take or promote the taking by others of steps to further the conservation of listed habitats and species, including through the continued implementation of Action Plans.

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APPENDIX II

ECOLOGICAL EVALUATION TECHNIQUES

APPENDIX II: EVALUATION TECHNIQUES

1.0 INTRODUCTION

A number of systems and criteria are available to assess the nature and extent of ecological interest found at any site. Guidelines for Ecological Impact Assessment have been prepared by the Institute of Ecology and Environmental Management (2006), which have been employed below. The IEEM guidelines detail a recommended approach to the valuation of ecological receptors on the following scale:

- International importance
- UK importance
- National importance (England/Northern Ireland/Scotland/Wales)
- Regional importance
- County (or Metropolitan)
- District (or Unitary Authority, City or Borough)
- Local or Parish; and/or
- Within immediate zone of influence only

2.0 HABITATS AND FEATURES

Internationally important habitats are considered to be those listed on Annex I of the Habitats Directive. All internationally important examples, however, should have been designated within Special Areas for Conservation (SACs). Other examples should be considered to be of value at the level for which they are designated (see below). There are published guidelines for the selection of SACs (see Brown *et al*, 1997) and SPAs and Ramsar Sites (Stroud *et al*, 1990).

There are similar published criteria for the selection of nationally important Sites of Special Scientific Interest (SSSIs) (NCC, 1989) which give criteria for both habitats and species.

The majority of Local Authorities have a system of 'second tier' sites which do not wholly fulfil SSSI designation criteria, but which are, nonetheless, of local to regional value. Policies, encouraged by Government advice, recognise that protection should be extended beyond the statutory sites to include the best examples of wildlife habitats, populations of rare species and geological features remaining in the District and are particularly valuable in supplementing and supporting the national framework for SSSIs. DEFRA (2006) has published Guidance on their Identification, Selection and Management of such sites. The Hedgerow Regulations (1997) provide a useful framework for the assessment of the ecological importance of hedgerows.

It is possible that there may be habitats that do not fall within designated sites but are considered to meet the published selection criteria. Similarly it is possible that habitats within designated sites may not fulfil the criteria for designation in their own right. This may be due to the site having deteriorated or that they have been included for other reasons such as secondary or supporting value. If a habitat is considered to be in an unfavourable condition, consideration must be given to its potential value if restored. Consideration should also be given to secondary or supporting value where

a habitat or feature may have no particular interest in itself but may perform an important ecological function such as a buffer against negative impacts or an important link between habitats. The presence of a diverse range of habitats can increase the value of a site.

3.0 SPECIES

A number of resources are available to assess the rarity and vulnerability of individual species. **Red Data Lists** utilise standard criteria defined by the International Union for the Conservation of Nature (IUCN, 2001, now the World Conservation Union, WCU) to classify the scarcity and conservation status of species of flora and fauna. The Red Data List system can operate at an International, National or Regional level (e.g. County Red Data Lists). The IUCN maintains a list of threatened species on a global scale.

The IUCN threat categories are defined as follows: Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD) and Not Evaluated (E). Species falling within the categories CR, EN and VU are considered to be threatened. These categories are defined by five criteria as follows:

- Criterion A considers the percentage decline of a taxon, regardless of current range or abundance.
- Criterion B is designed to identify threats associated with extremely restricted distribution when combined with other risk factors.
- Criterion C considers the combination of extremely small population size with similar risk factors to Criterion B.
- Criterion D identifies very small or restricted populations.
- Criterion E requires quantitative analysis to estimate the extinction probability of a taxon based on known life history, habitat requirements, threats and any specified management options.

Earlier Red Data Lists and Books (such as the British Red Data Book for Insects (Shirt 1987) and subsequent reviews: Falk, 1991 and Hyman and Parsons, 1992) classified species on the former IUCN criteria as: Extinct, Endangered (RDB1), Vulnerable (RDB2), Rare (RDB3) and insufficiently known (RDBK).

Criteria for the selection of Nationally Notable insects (now termed Nationally Scarce) species generally follow Eversham (1983). These Nationally Notable/Scarce species are further divided into Notable A (present in 16-30 squares) and Notable B (31-100 squares).

Rare birds in Britain are defined as any species for which records would have to be verified by the British Birds Rarities Committee. County rarities are taken to include all national rarities and also any species listed in County bird reports requiring a full description, which should be submitted to the relevant County Recorder. The presence of rare birds at any time of year, including locally rare species, adds significantly to the ecological value of a site. In general, however, only rare birds with a regular pattern of occurrence at a site should be included in this category.

National and County distribution atlases and species reports such as county bird reports can provide valuable additional information for evaluation. They can also provide information on species status at the level of geographic coverage of the atlas. Species at the edge of their distribution (especially in the context of global change) and notably large populations of species that are uncommon or threatened in the wider context enhances a species value. A species that is rare and declining should be assigned a higher level of importance than one that is stable. Other rarity related evaluation criteria include the need to protect populations for which the UK holds a large / significant proportion of the international / European population. The presence of a diverse assemblage of species can enhance the value of a site.

Further guidance on the evaluation of certain protected species has been published by English Nature e.g. *Great Crested Newt Mitigation Guidelines* (EN, 2001) and *Bat Mitigation Guidelines* (Mitchell-Jones, 2004) and non-statutory organisations e.g. Froglife (1999, endorsed by English Nature).

4.0 OTHER RESOURCES

4.1 *Natural Areas*

English Nature (now Natural England) has divided England into 120 '*Natural Areas*' described as areas of the countryside identified by their unique combination of physical attributes, wildlife, land-use and culture (English Nature, 1998). Natural Areas provide a useful framework for assessing species and habitats beyond the traditional administrative boundaries. In the UK Biodiversity Action Plan they are described as:

"... biogeographical zones which reflect the geological foundation, the natural systems and processes and the wildlife in different parts of England, and provide a framework for setting objectives for nature conservation"

The Natural Area profiles provide contextual information to confirm temporal and spatial scope. They can provide information to aid evaluation of the relative importance of ecological receptors.

4.2 *Biodiversity Action Plans*

The **UK Biodiversity Action Plan** (UK BAP) published in 1994 (UK Biodiversity Steering Group, 1995-1999) highlighted 38 key habitat types (now termed priority habitats), which were subsequently revised to include 26 non-maritime and 19 maritime priority habitats. A review was undertaken in 2007 resulting in the publication of a new list comprising 1,149 priority species and 65 priority habitats (40 terrestrial and 25 maritime).

Under the 2007 review, priority habitats were selected according to the following criteria:

1. Habitats for which the UK has international obligations;
2. Natural and semi-natural habitats at risk, such as those with a high rate of decline in extent and/or quality, especially over the last 20 years, or which are rare;

3. Habitats important for assemblages of key species.
4. Habitats which are 'functionally critical' i.e. those 'essential for organisms inhabiting wider ecosystems', may be useful in some cases as a supporting criterion but is unlikely to be a qualifying criterion in its own right.

Priority species were selected against the following criteria:

1. International threat;
2. International responsibility (of the UK) + moderate decline in the UK;
3. Marked decline in the UK; or
4. Other important factor(s).

Following the establishment of devolved governments in Scotland, Wales and Northern Ireland in 1998, each country produced its own biodiversity strategy. In 2002, DEFRA published *Working with the Grain of Nature: a biodiversity strategy for England*. This has since been superseded by *Biodiversity 2020: A strategy for England's wildlife and ecosystem services* (DEFRA, 2011) which builds on the Natural Environment White Paper (2011) and provides a comprehensive picture of how the Government is implementing its commitments under the Convention on Biological Diversity and the EU Biodiversity Strategy in England. It sets out the strategic direction for biodiversity policy for the next decade on land (including rivers and lakes) and at sea.

Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006 requires the Secretary of State to publish a list (in consultation with Natural England) of habitats and species which are of principal importance for the conservation of biodiversity in England. The Government has a duty to take reasonably practicable steps to further the conservation of the species and habitats that are included in lists published under Section 41. The S41 list includes all the habitats and species in England identified as requiring action under the UK BAP with the addition of hen harrier which, without continued conservation action, it is considered unlikely that its population will increase from its current very low levels in England.

Biodiversity Action plans at lower levels such as regional and county have also been produced for many areas.

Selection of habitats and species for BAPs is on the grounds that they are in a sub-optimal state and does not imply any specific level of importance of a habitat or species. The value of priority habitats and species should be determined as described above. Only where a specific habitat or species action plan states that all areas of a particular habitat or all populations of a given species should be protected should the habitat or species be valued at the appropriate level of the BAP. BAPs can assist in ecological evaluation but must be reviewed on a case by case basis.

4.3 *Bird Species of Conservation Concern*

Bird Species of Conservation Concern in the UK, Channel Islands and Isle of Man was first published in 1996, updated in 2002 (Gregory *et al*, 2002) and again in 2009 (Eaton *et al* 2009). The list is prioritised into species of high (red) and medium (amber) conservation concern; all other species are of lower (green) concern. Red-listed species are globally threatened according to IUCN (World Conservation Union) criteria or in rapid decline (greater than 50% over the past 25 years) in the UK, currently or historically and those that have declined historically and not shown a substantial recent recovery. Amber listed species are in moderate decline (25-49% over the past 25 years), rare breeders, localised or internationally important populations, of an unfavourable conservation status in Europe or those whose population has declined historically but made a substantial recent recovery. It should be noted that despite substantial declines, many red-listed species such as skylark (*Alauda arvensis*) and song thrush (*Turdus merula*) remain relatively common in the UK countryside. As for BAPs, inclusion of species on one of the lists is not sufficient in itself for assigning a level of value to the species concerned. Each species should be evaluated according to the guidelines above with reference to the criteria for inclusion of the species.

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APPENDIX III

SURVEY PHOTOGRAPHS



Photograph 1: Showing a typical arable field, field margin and hedgerow with mature trees



Photograph 2: View of a typical dry ditch



Photograph 3: View of a wet ditch with diverse aquatic vegetation present



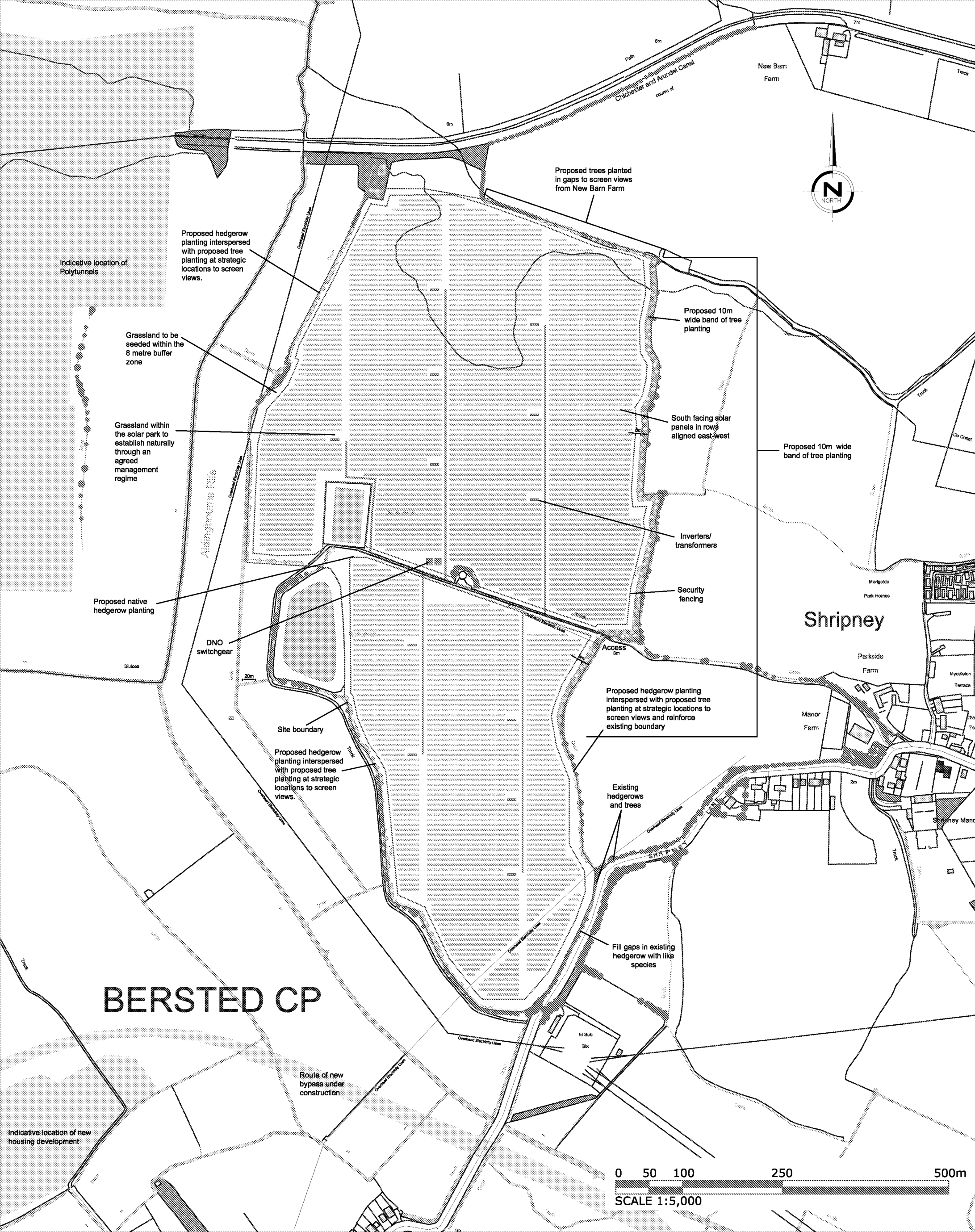
Photograph 4: View of the building



Photograph 5: View of pond 2 situated adjacent to the north-western corner of the site

APPENDIX IV

DRAWINGS

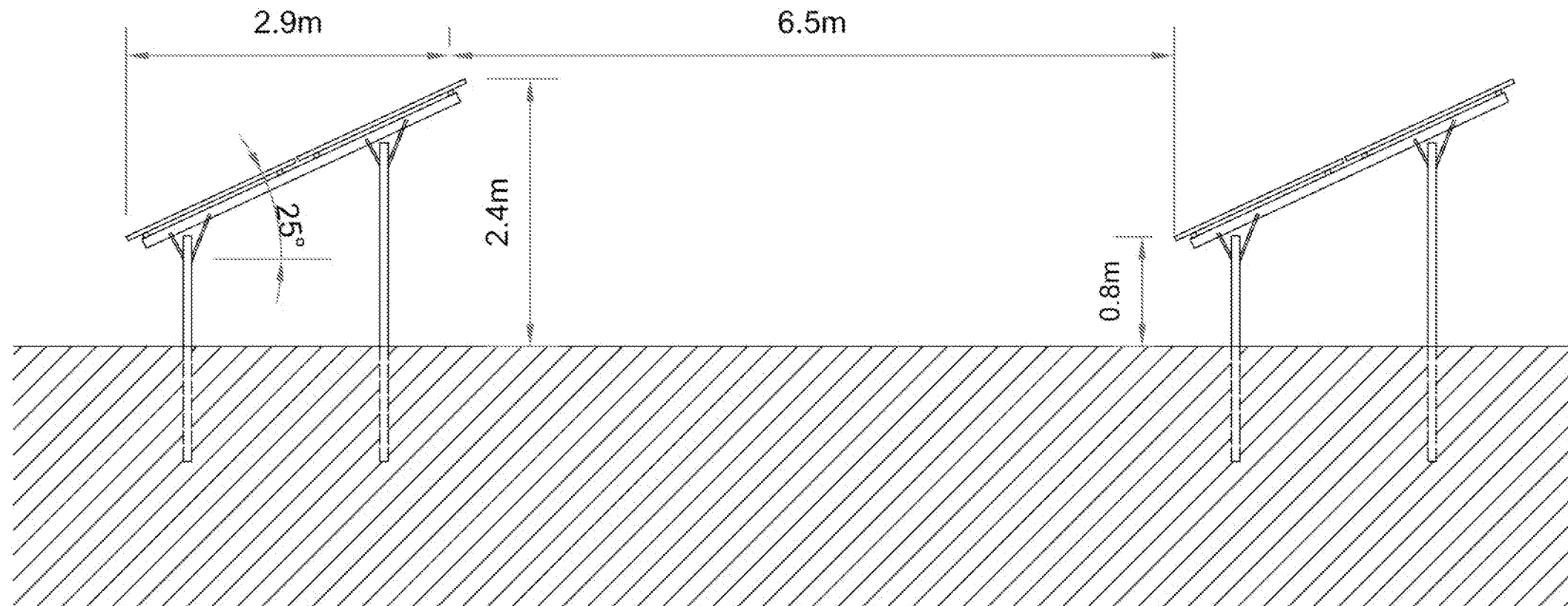


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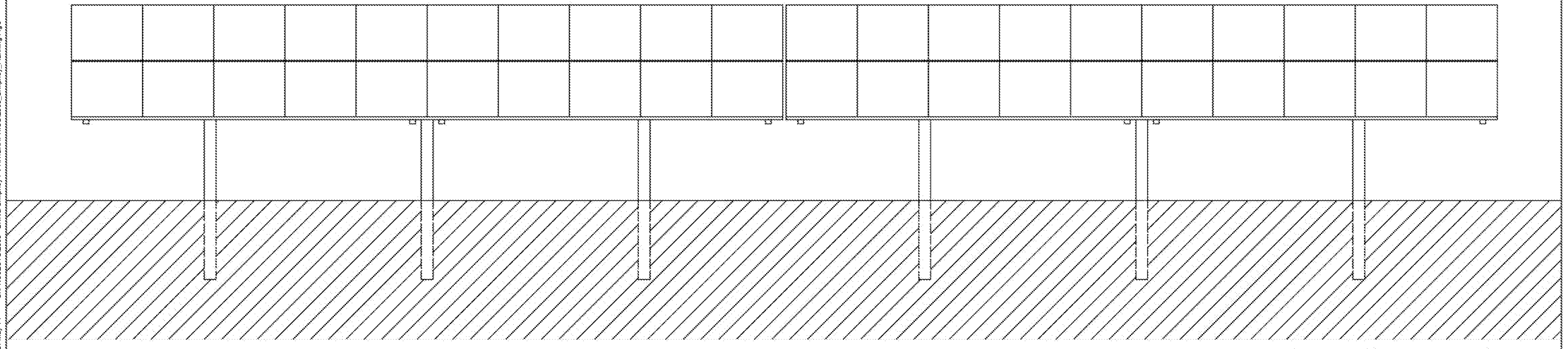
Environmental Planning • EIA • Landscape Architecture • Ecology • Development Planning

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				Auth:	AH	Drawing No:	2563_101

Side Elevation



Front Elevation



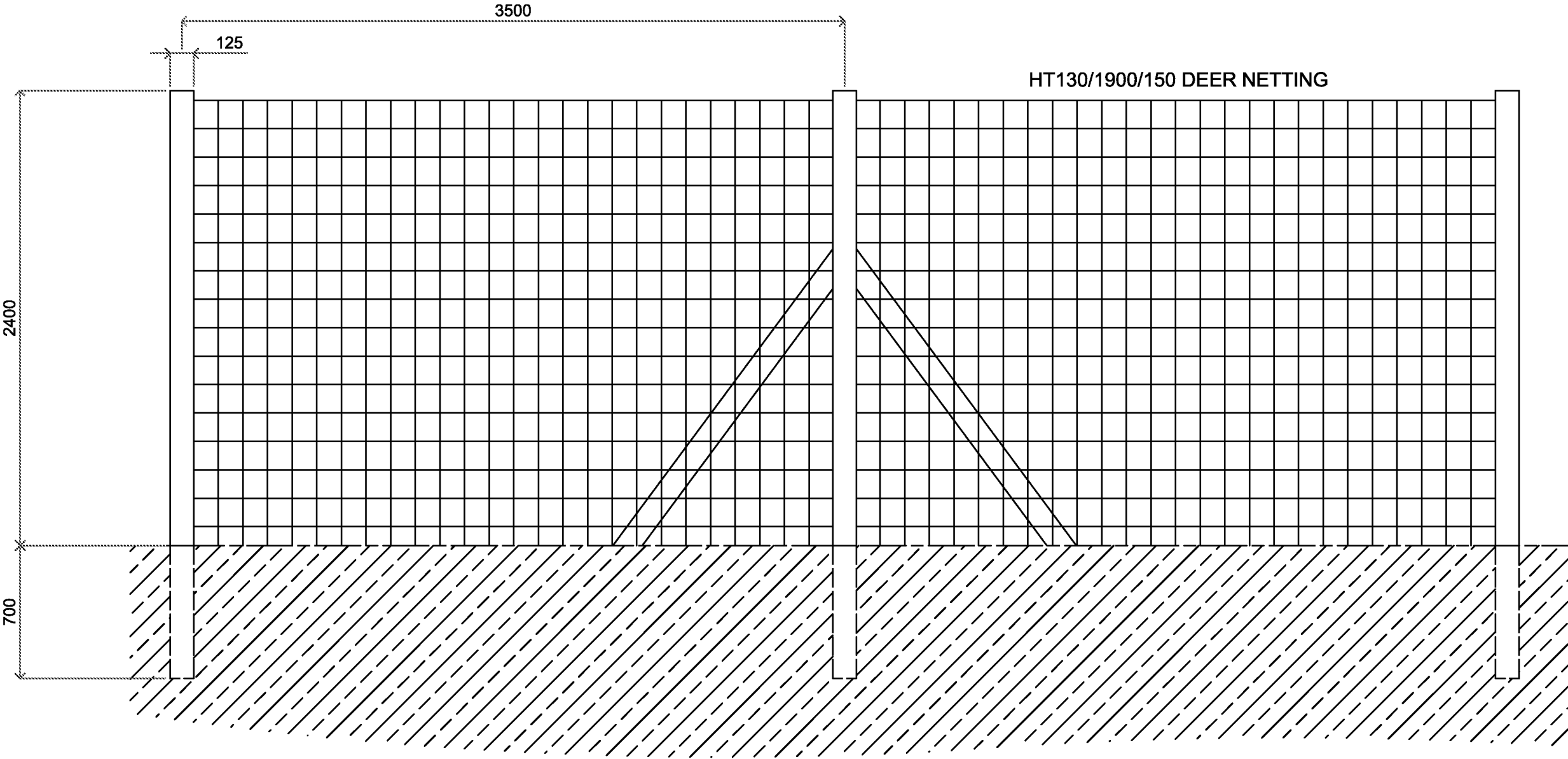
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Scale 1 : 50 @ A3

SHRIPNEY PV PARK

2605-4
Typical Panel Elevations





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REV DATE COMMENTS

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Check: CMcD
Auth: BR

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