ECOLOGICAL MANAGEMENT PLAN

PROPOSED SOLAR FARM, LAND ADJACENT TO BOSCOMBE AIRFIELD, IDMISTON

FOR LARK ENERGY

DELTA-SIMONS PROJECT No. 13-0673.03

ISSUED: MARCH 2015

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Figure 1 Proposed Compensation and Enhancement Measures

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1.0 INTRODUCTION

1.1 Context and Purpose

Delta-Simons Environmental Consultants Ltd was instructed by Lark Energy (the "Client") to provide an Ecological Management Plan (EMP) for the proposed Solar Farm development at land Adjacent to Boscombe Airfield near Idmiston (hereafter referred to as the "Site").

The EMP is required in order to satisfy pre-operational planning condition 9 (Planning Reference: 14/05740/FUL), which states:

"Before the scheme first becomes operational, an Ecological Management Plan (EMP) shall be submitted to and approved in writing by the Local planning Authority. The ecological management plan shall:

i) be based on the Outline Ecological Management Plan (Delta Simons, 20th November 2014);

ii) provide full details of the locations and measures that will be put in place to mitigate, compensate and enhance biodiversity on the site;

iii) contain a five year management programme for ecological features with details of how management will be continued for the duration of the scheme;

iv) contain details of a monitoring programme to assess the effectiveness of the EMP with reporting to the planning authority in the first, third and fifth years after the Site first becomes operational.

Planting, sowing and initial aftercare will be completed as specified in the approved EMP within one year of the Site becoming operational. Management works will be undertaken in accordance with the approved EMP and the first year of the management programme will start in the month in which the Site first becomes operational.

Reason: In the interests of ecology.'

The EMP has been written based upon information provided by the Client, the results and recommendations reported by Delta-Simons' Ecological Survey (report reference: Extended Phase 1 Habitat Survey, 13-0673.01, October 2013) and is based on the Outline Ecological Management Plan (Delta-Simons, November 2014) submitted as part of the Planning Application. The EMP has also been produced with reference to BRE National Solar Centre Biodiversity Guidance for Solar Developments 2014 and RSPB Advice for Farmers: Solar Farms Guidance.

The aim of the EMP is to:

- Set out best practice working methodologies and mitigation measures in order to protect the existing ecologically valuable habitats and any protected or notable species that occur at the Site;
- Provide enhancement measures to increase the biodiversity value of the Site; and
- Provide a management and monitoring plan in order to enhance and maintain the ecological value of the Site.

These measures are to ensure that biodiversity enhancements for the Site are considered in both the design and construction of the Solar Farm, and particular consideration is given to farmland birds, in order to ensure that any loss of habitat for these species is compensated for, and overall there is a net gain in the biodiversity value of the Site.

1.2 Site Description

The Site is centred at Ordnance Survey (OS) grid reference SU 1843 3907 to the north of Idmiston in Wiltshire. The Site covers an area of approximately 37 hectares although only 22.25 hectares are proposed for the development. The Site comprises two arable fields with a bisecting hedgerow and a strip of mixed plantation woodland. A section of the arable land is planted with game bird cover, and a small building formerly associated with the adjacent airfield is present within the eastern extent of the Site. Remnants of a second small building are also present on the Site.

The Site is situated within a predominately rural setting. Boscombe Down Airfield surrounds the Site to the north, east and west with associated runways, grassland and security fencing adjacent to the Site. Mixed plantation woodland defines the

southern Site boundary, separating the Site from further arable land and improved grassland fields.

Topographically the Site is undulating but appeared well drained and did not support any standing water at the time of the survey visits.

1.3 Proposed Development

The Site is proposed for a Solar Farm development, the details of which are shown in Figure 1. The proposed development aims to enhance and manage key ecological features in order to increase the biodiversity value of the Site. Installation of the solar farm will allow the land to be taken into appropriate management to enhance its biodiversity value for the future.

2.0 PREVIOUS REPORTS AND BASELINE DATA

2.1 Extended Phase 1 Habitat Survey

An Extended Phase 1 Habitat Survey was undertaken by Delta-Simons in October 2013 in order to identify habitat types on the Site using the standardised Phase 1 Habitat Survey technique and to identify areas of potential for protected species/species of conservation concern within the Site and immediately surrounding the Site and the potential impacts of the proposed development on these species.

The survey Report concluded that:

- The woodland and hedgerow at the Site provide suitable habitat for nesting birds, and the arable land provides potential opportunities for ground nesting species. The open arable land at the Site may also provide suitable habitat for stone curlew, the majority of which will be lost to the proposed development. The eastern extent of the Site is to remain undeveloped and will continue to provide farmland habitat for this species if they occur on-Site;
- The trees at the Site boundaries lacked the features necessary to support roosting bats, however, the boundary hedgerows and woodland edge provides ideal habitat for commuting and foraging bats if they occur in the local area. It is understood that these habitats are to be retained following the development, and the Site will continue to provide opportunities for bats;
- A disused badger sett was recorded within the woodland strip to the east of the Site, whilst extensive evidence of badger activity in the form of dung pits, latrines, mammal runs and snuffle holes, was recorded throughout the Site. Evidence of badger activity was also identified within the woodland habitat to the south of the Site with further disused sett entrances, digging and mammal runs. It is considered likely that badgers regularly use the arable land for foraging.; and
- A brown hare was recorded at the Site during the survey. The Site provides suitable habitat for this species, which may venture onto the Site during the proposed construction works.

2.2 Pre-Commencement Site Visit

In order to satisfy pre-commencement planning condition 10, a walkover of the Site was undertaken by a Delta-Simons ecologist in December 2014 in order to identify any risk to protected species or ecological features prior to the commencement of the

proposed solar farm development works. This Site visit identified a further two badger setts within the woodland strip to the east of the Site. These comprised a single entrance sett which appeared to have been in recent use, as well as a five hole sett including three active and two disused entrances. All tunnels lead away from the Site and are considered to be a sufficient distance from the proposed works to remain undisturbed by the construction works.

3.0 MITIGATION DURING THE PROPOSED DEVELOPMENT WORKS

The proposed development footprint is situated entirely within the existing arable habitat which was assessed as having low ecological value. The bisecting hedgerow is to be retained at the Site and the adjacent woodland habitat will remain unaffected. Mitigation measures should be included as part of any tool box talks or inductions that are provided to the construction Site team, where appropriate.

3.1 Hedgerows and Trees

With the exception of minor hedgerow removal to facilitate installation of the security fencing, the bisecting hedgerow and adjacent off-Site woodland are to be retained following the development, and all works are to be undertaken a sufficient distance away such that the vegetation will not be impacted upon. There is no access route along the hedge and following commencement of works all contractors have been made aware that no vehicles or other machinery are permitted to operate in the vicinity of the hedgerow. The hedgerow is defunct with spindly vegetation and large gaps. The hedgerow will be enhanced following the development.

Retention of these habitats will maintain nesting and foraging opportunities for birds, as well as foraging and shelter for a range of faunal species.

3.2 Breeding Birds

The majority of the bisecting hedgerow and all of the adjacent off-Site woodland is to be retained following the development, providing continued opportunities for nesting and foraging birds. An existing gap within the eastern extent of the defunct hedge has been utilised for the installation of the security fence. This gap will be replanted as part of post development enhancement measures. Approximately 1 m of hedgerow has been removed from the western extent in order to facilitate the installation of the security fencing, which will be re-planted following completion of the the development. The arable land had provided opportunities for ground nesting birds and will be lost as part of the development plans.

Site preparation works have already commenced at the Site. Initial works involved vegetation clearance to facilitate the proposals and reduce the suitability of the Site to support ground nesting birds. Following installation of the security fencing all works will be undertaken within the fence line. Major piling works will be undertaken across the Site prior to the panel installation works, which are undertaken one panel at a

time. Undertaking these works will ensure no areas of the Site remain undisturbed. Site activity is expected to be most intense during March and for the following six weeks, which is considered likely to discourage any ground nesting birds during the main breeding season, especially given the lack of ground cover.

There is also the potential to enhance the Site for nesting birds as indicated in the RSPB: Wildlife Enhancement Package for Solar Farms on Former Arable Land and the BRE National Solar Centre Biodiversity Guidance for Solar Development. It is considered likely that following the development, grassland between the rows of solar arrays may be utilised by ground nesting birds and that the panels will provide shelter for ground nesting birds both in term of inclement weather and aerial predators. As access to the Site will be limited, with visits only for infrequent maintenance works, anthropogenic disturbance will be minimal. A preliminary study by Parker and McQueen (2013) recorded ground nesting birds utilising solar farm sites in Britain.

The solar panels to be installed will be matte for maximum absorption of solar rays and in order to reduce glare. The development is, therefore, considered unlikely to cause any negative impact upon birds in flight from misperception of the solar farm for a water body as a result of light reflection or glare.

Removal of the hedgerow section to facilitate the security fencing has been completed outside of the nesting bird season. Management works to the on-Site hedgerow will be avoided during the nesting bird season. If, however, under extraordinary circumstances they have to be carried out, during the nesting bird season (March-July, inclusive), an experienced ecologist will first check them to confirm that no nesting birds will be affected by the proposed works. If any active bird nests are found, the works will be delayed. An appropriate exclusion zone will be clearly marked out around the nest, and this area left undisturbed until after the chicks have fledged and the nest is no longer in use.

3.3 Bats

No additional lighting is required at the Site and the proposed infra-red lighting for the security cameras is not believed to impact upon nocturnal wildlife. The Site and boundary features will, therefore, continue to be suitable for foraging and commuting bats and, connectivity will be retained within the wider landscape. Furthermore, planting at the Site will aim to increase invertebrate diversity and numbers and, therefore, enhance foraging opportunities for bats.

3.4 Badgers and Brown Hare

Due to the presence of badger within the local area, and the suitability of the Site to support both badger and brown hare, it is recommended that a precautionary approach is undertaken such that prior to commencement of the proposed works, contractors should be made aware of the potential presence of badgers in the local area. Should any evidence of fresh digging be identified at the Site, or within the immediate proximity of the Site, in addition to that which has already been identified, works should stop within that area immediately, and Delta-Simons should be contacted to determine the most appropriate way forward. Furthermore, as is best practice at sites where badgers and brown hare may be present, a precautionary approach should be taken such that either no excavations are left uncovered overnight during the construction phase of the works, or mammal ramps are installed in order to prevent these species from becoming trapped.

Due to security issues, the perimeter fencing at the Site is to be set at ground level, which may cause temporary restrictions on the movement of badgers and brown hare across the Site. It is considered likely that the badgers may re-gain access to the Site by digging beneath the fence line, however, in order to improve continued access to the Site for mammals, badger gates will be incorporated within the fence-line along the eastern and southern Site boundaries. The location of these will be agreed with the Client in order to maintain the security of the Site whilst enabling access for mammals and allowing continued access for foraging, particularly from the adjacent woodland. Following the development, the grassland habitat at the Site will continue to provide foraging opportunities for badgers with only temporary disturbance during construction activities. In addition, the land around the outside of the security fencing will provide foraging opportunities as well as commuting corridors for badgers and other mammals.

4.0 BIODIVERSITY ENHANCEMENTS AND MANAGEMENT

In order to enhance the Site for farmland birds and other wildlife, and to compensate for any losses of habitat, a variety of enhancement measures are proposed including the provision of invertebrate- rich habitat and on-Site nesting habitat for farmland birds. The incorporation of these features provides a range of resources to support farmland birds year round as well as enhancing the Site for other wildlife including invertebrates and small mammals, including bats. The enhancement measures are in accordance with the objectives of Section 109 of the National Planning Policy Framework. Funding for the enhancement measures and subsequent management and monitoring will be covered within the operational and management budget for the development.

4.1 Hedgerow

The existing bisecting hedgerow is species-poor, supporting only hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa,* and currently unmanaged. The hedgerow is defunct with areas of spindly vegetation and regular gaps. In order to enhance this habitat, additional species will be incorporated in it to strengthen the hedgerow, widen the vegetation corridor and fill in the thin areas / gaps, creating an intact linear corridor across the Site. Native (or species of known value to wildlife) hedgerow species are to be incorporated, which will enhance the ecological value of the Site and to provide increased foraging opportunities and connectivity for invertebrates, birds and bats.

New hedgerow planting will comprise the following species:

- ∆ 40 % Hazel *Corylus avellana;*
- ∆ 40 % Field maple *Acer campestre;*
- ∆ 10 % Holly *Ilex aquifolium; and*
- ∆ 10 % Dog rose *Rosa canina*.

Planting

Prior to planting, the ground will be prepared such that the plants can grow successfully. The soil should have a good tilth (particle size, moisture content, degree of aeration, rate of water infiltration, and drainage) so that the roots can establish. Planting will not be undertaken if the ground is suffering from hard frost or

is heavily water logged, however, planting should be undertaken during the late autumn and winter months when the whips are dormant, in the next available planting season following completion of the development.

Newly planted stock will be protected from grazing mammals, such as rabbits. Individual plants will be protected by plastic shelter guards or mesh guards. Hedging will be checked as part of general maintenance at least four times per year for the first five years. Protective or supporting structures will be removed as soon as possible to avoid dependence on support.

Hedgerows planted in a double staggered row tend to be better for wildlife than single rows, as they are wider and provide more shelter and habitat. Therefore, gapping-up of the existing hedgerow will incorporate double planting to match the existing width of the hedgerow.

Management

Light, regular, trimming of the hedgerow in its early years will encourage dense, bushy growth, therefore, newly planted hedgerow plants will be cut back once a year for the first three years.. Established hedgerows will receive less frequent management, being cut only once every two to three years. Any plants that die in the first three years will be replaced with the same species in the next available planting season to prevent gaps developing.

4.2 Fine Grassland

To provide nesting habitat for farmland birds as well as suitable habitat for small mammals and the larvae of pollinating insects e.g. butterflies and moths, a fine grass mix will be sown beneath the solar arrays within the southern extent of the Site. A suitable seed mix will be chosen, which is appropriate for the location and soil conditions, but will comprise at least 75 % of the following species: Common bent *Agrostis capillaris*, creeping red fescue *Festuca rubra*, hard fescue *Festuca longifolia* and smooth stalked meadow grass *Poa pratensis*.

Ground preparation should follow the supplier's instructions with the removal of weeds, rubbish and stones of over 20 mm diameter. The seed will be sown following development activities during times of sufficient warmth and moisture, ideally in late spring or early autumn.

During the first year annual weeds are to be managed by topping or mowing. In subsequent years the grassland will be managed using traditional meadow management based upon a main summer hay cut and additional autumn and spring mowing. Alternatively light sheep grazing will be applied following the summer cut up until the New Year. The grassland will not be cut from spring to late July/ August in order to allow the species opportunity to flower and to prevent disturbance of ground nesting birds. Following flowering the grassland should be cut back to approximately 50 mm and the cuttings left in-situ for 1-7 days, before removal, such that they dry and shed seed.

4.3 Wildflower Grassland

To provide pollen and nectar rich habitat for a range of insects, a wildflower grassland seed mix will be sown beneath the solar arrays within the northern extent of the Site. Emorsgate EM1 seed mix will be applied which includes a range of floral species suitable for pollinators including red clover *Trifolium pretense* and bird'sfoot trefoil *Lotus corniculatus.* This general seed mix is suitable for a range of soil types.

Ground preparation should follow the supplier's instructions with the removal of weeds, rubbish and stones of over 20 mm diameter. The seed will be sown following development activities during times of sufficient warmth and moisture, ideally in late spring or early autumn.

During the first year annual weeds are to be managed by topping or mowing. In subsequent years the grassland will be managed using traditional meadow management based upon a main summer hay cut and additional autumn and spring mowing. Alternatively light sheep grazing will be applied following the summer cut up until the New Year. The grassland will not be cut from spring to late July/ August in order to allow the species opportunity to flower and to prevent disturbance of ground nesting birds. Following flowering the grassland should be cut back to approximately 50 mm and the cuttings left in-situ for 1-7 days, before removal, such that they dry and shed seed.

4.4 Habitat Piles

Habitat piles will be created using brash from the hedgerow removal works covered with soil within open areas not supporting solar arrays. These will mature to provide valuable habitat for mosses, lichens and fungi, as well as invertebrates and potentially amphibians.

4.5 Nesting Birds

The enhancement of the existing hedgerow at the Site will provide further opportunities for nesting and foraging birds, whilst the new grassland habitat across the Site will enhance the area for ground nesting species, incorporating year round provision for farmland birds. Open space between the rows of panels, bordering the installation, and within areas unsuitable for development will provide ideal habitat for ground nesting birds. The panels themselves may also provide shelter from inclement weather and aerial predators, and a number of different species have been found to use the framework supporting the panels for nesting. Appropriate management at the Site will ensure the protection of nesting birds from anthropogenic disturbance and will maintain habitat suitability.

4.6 Ecological Monitoring

The habitats across the Site will be checked between June and August by a suitably qualified ecologist during the first, third and fifth year after the Site becomes operational. A Report of the findings will be prepared and submitted to the Local Planning Authority. Any failed shrubs will be replaced. If germination of individual wildflowers or grassland species is poor an alternative species mix may be sown subject to agreement with the ecologist. Continued monitoring of establishment and vegetation health should then continue alongside management activities annually, and any failing vegetation reviewed in terms of its replacement and/ or change in management regime. During routine management visits, observations will be made for the use of the Site by faunal species, including evidence of nesting birds, badgers and invertebrates. If necessary the management regime will be reviewed in order to further enhance the Site for these targeted species. Future management and monitoring will be funded through the operational and monitoring budget for the Site.

5.0 LOCALLY IMPORTANT BIODIVERSITY

Currently the Site comprises arable land which was assessed as having low ecological value. Installation of the solar farm will allow the land to be taken into an appropriate management regime to enhance its biodiversity value for the future, in particular through sensitive planting and management for farmland birds.

The proposed mitigation, enhancement and management at the Site will include native hedgerow and grassland habitats. Species to be planted will be native or of known value to wildlife, and appropriate management will maintain the ecological value of the Site. This will enhance the Site for a variety of invertebrates including bees and butterflies, and will in turn provide foraging opportunities for birds, bats and, other small mammals. Wildflowers, as well as sources of berries, nuts and nectar within the hedgerow planting, will provide foraging opportunities for a range of both nationally and locally important species, and connectivity to other suitable habitat within the local area.

6.0 SCHEDULE OF WORKS AND MANAGEMENT REGIME

Report Section Reference	Activity	Pre-commencement	Construction Year 0	Year 1	Year 2-3	Year 4 to 25
3.1	Trees/Hedgerow protection measures	No works to be undertaken within proximity of the woodland or hedgerow. No access route adjacent to hedgerow and contractors made aware of restriction to works within close proximity to hedgerow (Site works currently underway)		No actions	No actions	No actions
3.2	Breeding Birds – Vegetation management	Site clearance works and hedgerow removal completed.	Future hedgerow management to avoid bird nesting season or to be preceded by a check by a suitably experienced ecologist.			
3.4	Badgers and brown hare– Construction works	Contractors made aware of potential for badgers. Should any evidence of fresh digging be identified works should stop within that area immediately, and Delta-Simons contacted.	Best practice measures followed - no excavations to be left uncovered overnight or mammal ramps installed Gates/holes incorporated	General observations made during habitat management to determine any badger activity associated with the security fence and provide access, where necessary.		

			into fence			
4.1	Hedgerow planting and management		Planting undertaken during next available season following construction. Appropriate ground preparation and planting techniques implemented. Protective guards applied to new plants	Weed as required to avoid competition by ruderals. Monitor for individual success. Prune newly planted hedgerow plants annually for the first three years Check guards and supports to ensure they are still effective and do not restrict growth Replace any plants which die in the first three years.		Once established to a height of approximately 1.5 m – 2 m, hedgerow trimmed once every two-three years. Management works should avoid the bird nesting season (March-July) Annual monitoring of habitat success. Any failed plants to be replaced.
4.2 and 4.3	Fine grassland and Wildflower grassland		Prepare ground and sow in autumn or spring following construction	April to June – top or mow to remove weed species	No management spring to late July/August. Following flowering in late July/ August cut back to 50 mm and leave for 1-7 days to dry and shed seed, then remove all cuttings from Site. Can be cut again in autumn and spring if necessary, or apply, light sheep grazing until New Year. Habitat monitored annually July-August to	

					determine growth success and species diversity. If germination of individual wildflowers or grass species is poor an alternative wildflower species mix may be sown subject to agreement with the Ecologist.
4.3	Habitat piles		Installation immediately following construction process	Limited management should be required, however, damaged or deteriorating hibernacula should be replaced.	

This Report was prepared by:

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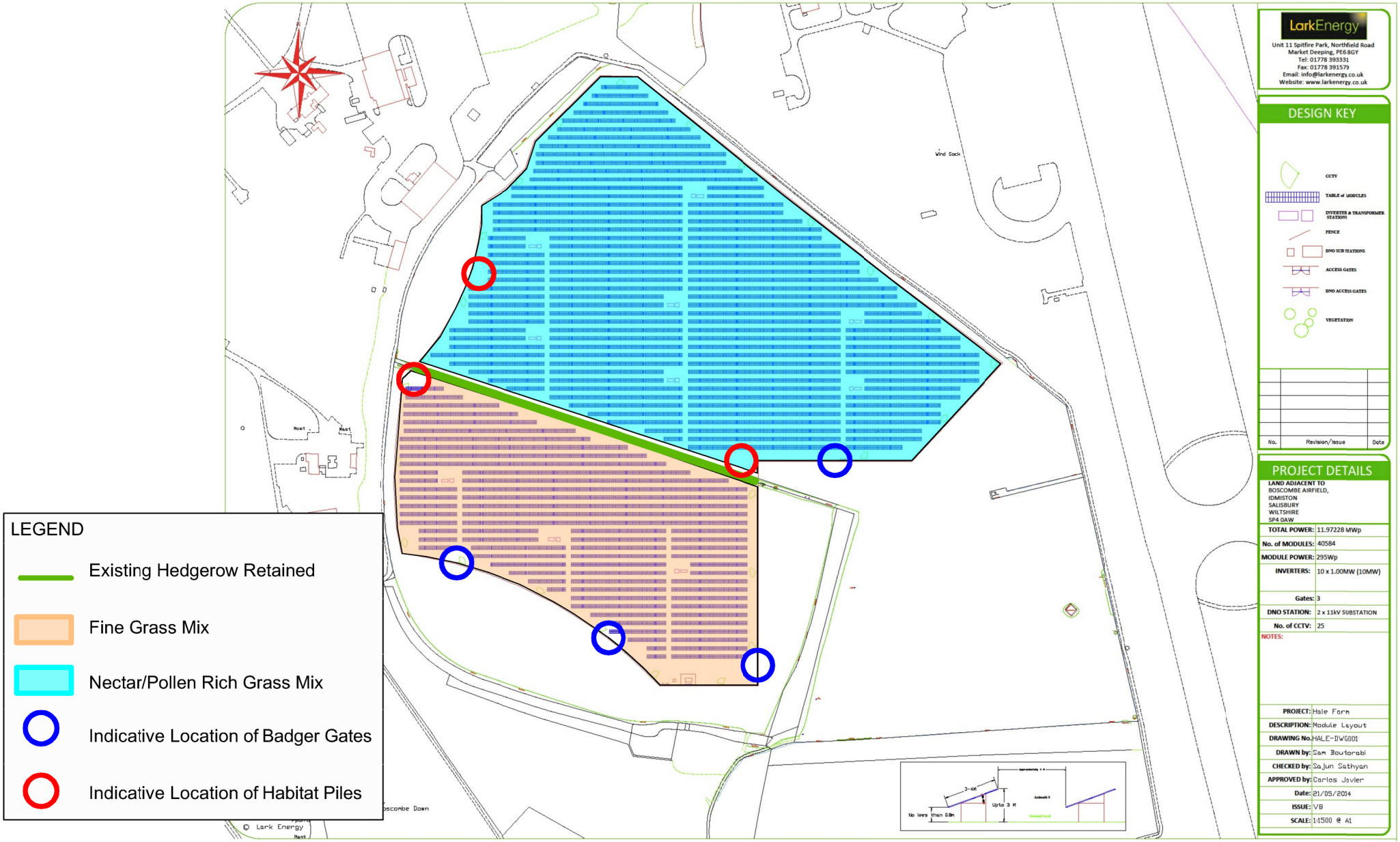
Figures



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Proposed Compensation and Enhancement Measures
Land Adjacent to Boscombe Airfield
Idmiston

DWN: JB	DESIGN: Not to Scale	PROJECT NO.: 13-0673.03	
CHK: CS	REV: 1	FIGURE: 1	
DATE: 2nd February 2015			