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Prepared by	Checked by	Verified by	Approved by
MP Associate Ecologist	AD Associate Director (Ecology)	MW Technical Director	NT Project Director, CEnv

Prepared for:

Prepared by:

AECOM Limited
Midpoint, Alencon Link
Basingstoke
Hampshire RG21 7PP
United Kingdom

T: +44(0)1256 310200
aecom.com

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1. Introduction

1.1 Background

1.1.1 In 2020 and 2021, AECOM undertook a Preliminary Ecological Appraisal (PEA) (**Appendix 8B: PEA** of the Environmental Statement (ES) [EN010118/APP/6.2]) of the Longfield Solar Farm Site on behalf of Longfield Solar Farm Ltd (hereafter referred to as 'the Applicant'). This PEA identified the need for follow-up ecological surveys and assessments to determine a baseline and potential impacts of the proposed Longfield Solar Energy Farm (hereafter referred to as 'the Scheme') on protected and, or notable species. As part of this work, AECOM undertook flora surveys within the Scheme boundary (hereafter referred to as the 'Order limits') (see **Figure 1-1: Scheme Location and Figure 1-2: Order limits** of the ES [EN010118/APP/6.3]).

1.2 Order limits Description

- 1.2.1 The Order limits is located in Essex within the administrative areas of Braintree District Council and Chelmsford City Council.
- 1.2.2 The Order limits is approximately centred on National Grid Reference (NGR) TL 74179 14620 and located approximately 1.1 kilometres (km) to the west of the village of Terling (see **Figure 1-1: Scheme Location** of the ES [EN010118/APP/6.3]).
- 1.2.3 The Order limits comprises a single parcel of land separated by several areas of woodland in total approximately 453 hectares (ha) in size.
- 1.2.4 The landscape features within the Order limits consist of agricultural fields mainly under arable production, with some small parcels of pasture, interspersed with individual trees, hedgerows, linear tree belts, small woodland blocks and farm access tracks. The hedgerows within the Order limits range between lengths of dense tall vegetation (shrub and tree species), the dominant hedgerow type in the landscape, and thin lines of vegetation with sporadic trees. The arable fields are of small to moderate size, some of which are of irregular shape.
- 1.2.5 The landscape features immediately surrounding the Order limits comprise a number of villages, including Fuller Street approximately 300 metres (m) to the north, Gamble's Green and Terling 500m and 1.1km to the east, Boreham 500m to the south-west, Hatfield Peverel 1.5km to the south-east and the city of Chelmsford 5.7 kilometres (km) to the south-west. Boreham Road runs north to south along the western edge of the Order limits, with the A12 carriageway abutting and bounding the southern edge of the Order limits boundary.
- 1.2.6 The northern part of the Order limits and surrounding area consists of undulating and relatively elevated landform, as part of the River Ter valley. The landform rises steeply northwards from the river and Terling Spring, between 35 m Above Ordnance Datum (AOD) to 50m AOD along parts of Braintree Road. It culminates at a ridgeline at 70m AOD at Rank's Green, in the northern part of the Order limits. To the south of the River Ter, the landform also rises steeply, across Sandy Wood, to a ridgeline at 55m AOD.

- 1.2.7 To the west of the Order limits, the landscape consists of a varied pattern of landform, reflecting past sand and gravel extraction and engineered flat terrain across Boreham airfield, which is situated at 55m AOD approximately 800m to the west of the Order limits. From the airfield, the landform falls very gradually eastwards to the River Ter, which flows southwards between Terling and the northern part of Hatfield Peverel, at approximately 20m AOD.
- 1.2.8 The River Chelmer is present 2.5km to the south of the Order limits, at approximately 15m AOD. There are several large-scale reservoirs and lakes adjacent to the river. From the river, the landform rises consistently northwards, to form a ridgeline around 40m AOD at Boreham, and southwards, across Little Baddow, to an elevated ridgeline at 100m AOD, approximately 3km from the Order limits.
- 1.2.9 Most of the southern and central part of the Order limits is located across flat and low-lying landform at approximately 45m AOD, between Waltham Road / Boreham Road and Terling Road. The northern part of the Order limits is located within part of the River Ter valley, where there is rising land to the north and south of Terling Spring and adjacent to Braintree Road.

1.3 Description of the Scheme

- 1.3.1 Longfield Solar Farm is a new solar farm scheme that would connect to the national electricity transmission network. The Scheme will use ground mounted solar photovoltaic (PV) panel arrays to generate electricity energy from the sun and combine these with a Battery Energy Storage System (BESS). The Scheme will be connected to the national electricity transmission network by an underground cable. The Scheme will be located within the Order limits as shown in **Figure 1-1: Scheme Location** of the ES [EN010118/APP/6.3].
- 1.3.2 The principal infrastructure will be located within the Order limits and will include:
- a. Solar PV modules;
 - b. PV module mounting structures;
 - c. Inverters;
 - d. Transformers;
 - e. Switchgears (housed inside a building);
 - f. On-site cabling;
 - g. One or more BESS (expected to be formed of lithium ion batteries storing electrical energy);
 - h. An electrical compound comprising a substation and control building;
 - i. Fencing and security measures; and
 - j. Access tracks.
- 1.3.3 During the construction phase, one or more temporary construction compound(s) will be required as well as temporary roadways to facilitate access to all land within the Order limits.

1.3.4 Further information on the Scheme is provided in **Chapter 2: The Scheme** of the ES [EN010118/APP/6.1].

1.4 Scope of this Report

1.4.1 The PEA Report (Ref 1) identified arable field margins, habitats of principal importance as listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, which could be potential constraints to the works or influence the design and implementation of the Scheme. It was also identified that the proposed cable route may cross a small number of hedgerows (also habitats of principal importance) so these were also assessed in relation to the ecology and landscape criteria of the Hedgerow Regulations 1997 and their species richness to help determine their biodiversity importance and to allow a future assessment in the Environmental Statement (ES) of potential impacts.

1.4.2 Other important habitats, such as other hedgerows and ancient woodland are not included in the surveys as they are currently scoped out, as they are unlikely to be impacted based on buffer zones and/or location outside the Scheme.

1.4.3 Although not identified as priority habitat types, an assessment of the semi-improved grassland composition (*i.e.*, set-aside and verges) was undertaken.

1.4.4 This report includes the following information:

- a. Relevant legislation and policy;
- b. Methods for desk and field-based assessments undertaken in 2020;
- c. Limitations to the surveys undertaken and any assumptions made as a result of any incomplete data;
- d. Survey results including habitat location, size, floristic and structural composition;
- e. Assessment of biodiversity importance of the habitats; and
- f. Conclusions.

1.4.5 Sites designated for their biodiversity value are described and appraised in the main Environmental Statement (ES). Botanical nomenclature in this report follows that of Stace (2019) (Ref 2) for vascular plants and Atherton et al. (2010) (Ref 3) for bryophytes. The scientific name is given only the first time the species is mentioned in the main text.

1.4.6 This report is a technical appendix to accompany **Chapter 8: Ecology** of the ES [EN010118/APP/6.1], reporting on and evaluating the baseline data collected throughout 2020 and 2021.

2. Relevant Legislation and Policy

2.1 Relevant Legislative Context

Flora and Habitats

- 2.1.1 Part 1 of the Wildlife and Countryside Act 1981 (as amended) (Ref 4) affords specific protection to flora listed on Schedule 8 (flora, fungi and lichens).
- 2.1.2 Section 13 of this Act protects plants from picking and sale of plants or parts of plants listed in Schedule 8, as follows:
- a. Intentional picking, uprooting or destruction (Section 13 1a);
 - b. Selling, offering for sale, possessing or transporting for the purpose of sale (live or dead, part or derivative) (Section 13 2a);
 - c. Advertising (any of these) for buying or selling (Section 13 2b); and
 - d. In certain circumstances, licences can be granted to permit some actions prohibited under the Act.
- 2.1.3 Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (Ref 5) includes a list of habitats and plant species of principal importance for nature conservation in England which is to be used by decision-makers to guide the implementation of their duties under Section 40 of the Act. This Section 41 list includes arable field margins habitat. Decision-makers are required to have regard to the conservation of biodiversity in England when carrying out their normal functions; consideration of the Section 41 list is integral to this. In addition, with regard to those species and habitats on the list of Species of Principal Importance listed under Section 41, the Secretary of State must:
- a. *“Take such steps as appear to the Secretary of State to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section, or*
 - b. *Promote the taking by others of such steps.”*

Hedgerows

- 2.1.4 A hedgerow is defined by Defra (Ref 6) as: *“Any boundary line of trees or shrubs over 20m long and less than 5m wide, provided that at one time the trees or shrubs were more or less continuous. It includes an earth bank or wall only where such a feature occurs in association with a line of trees or shrubs.”*
- 2.1.5 The Hedgerows Regulations 1997 (the Regulations), made under the Environment Act 1995, were introduced in England and Wales in 1997 in order to protect this characteristic element of the countryside. The Regulations were amended by the Hedgerows (Amendment) (England) Regulations in 2002.
- 2.1.6 The Regulations prevent the removal of most countryside hedgerows without first submitting a hedgerow removal notice to the local planning authority. This is not required if the removal is part of a planning application, but consideration and application of the Regulations can still be beneficial for the purposes of consistent assessment.

- 2.1.7 Under the Regulations, criteria are established that are to be used by the local planning authority to determine which hedgerows are 'Important'. The criteria relate to the value of the hedgerows from an archaeological, historical, landscape or ecological perspective.
- 2.1.8 The Regulations provide a series of comprehensive assessments to identify 'Important' hedgerows. Note that a hedgerow is not protected if it's in, or marks the boundary of, a private garden. To qualify as 'Important' under the Regulations, the hedgerow must comply with the following list of criteria:
- a. It must have a continuous length of or exceeding 20m;
 - b. Has a continuous length of less than 20m, but meets another hedgerow (by intersection or junction) at each end; and
 - c. It must be more than 30 years old.
- 2.1.9 In addition to the above criteria, to be deemed 'Important', a hedgerow must meet one or more of the following criteria:
- a. The hedgerow contains a species of bird, animal or plant listed on Part 1 of Schedule 1, Schedule 5 or Schedule 8 within the Wildlife and Countryside Act 1981 (as amended).
 - b. The hedgerow is adjacent to a public right of way (PRoW), such as a bridleway, footpath, road used by a public path, or a byway open to all traffic, and contains at least four woody species (as defined in Schedule 3 of the Regulations (see Annex B – Hedgerow Regulations and Schedules), on average, in a 30m length, plus at least two Associated Features within Part II Criteria, (see Annex C – Importance of Ecological Features Criteria, for full details).
- 2.1.10 The hedgerow includes one or more of the following:
- a. At least seven woody species, on average, in a 30m length;
 - b. At least six woody species, on average, in a 30m length, plus at least three Associated Features within Part II Criteria;
 - c. At least six woody species including a Black Poplar (*Populus nigra* subsp. *betulifolia*); Large-leaved lime (*Tilia platyphyllos*), Small-leaved lime (*Tilia cordata*) or wild service tree; or
 - d. At least five woody species, on average, in a 30m length and at least four Associated Features within Part II Criteria.

2.2 National and Local Planning Policy

- 2.2.1 National and local planning policy relevant to nature conservation is provided in detail in the PEA (Ref 1) for the Scheme, as part of this ES, **see Appendix 8B** of the ES [EN010118/APP/6.2].
- 2.2.2 The Essex Design Guide (Ref 7) states that "*New developments in Essex will be expected to enhance existing biodiversity and to create new habitats, together with providing resources for the management of those habitats into the future. Statutorily protected plants and species need special consideration but can co-exist with development if adequate site management arrangements are in place. In addition, the Ecological Strategy should consider habitats and species listed in the UK and Essex Biodiversity Action Plans.*"

2.3 Priority Species & Habitats

- 2.3.1 The UK Biodiversity Action Plan (UKBAP) was launched in 1994 and established a framework and criteria for identifying species and habitat types of conservation concern. From this list, action plans for priority habitats and species of conservation concern were published and have subsequently been succeeded by the UK Post-2010 Biodiversity Framework (July 2012) (Ref 8). The UK Post 2010 Development Framework is relevant in the context of Section 40 of the Natural Environment and Rural Communities (NERC Act) 2006, meaning that Priority Species and Habitats are material considerations in planning. These habitats and species are identified as those of conservation concern due to their rarity or a declining population trend.
- 2.3.2 There are opportunities for enhancement in the Essex Design Guide (Ref 7) for new development which should include “*measures to encourage biodiversity by creating varied habitats and a rich diversity of trees and planting throughout the built environment. Preferred habitats for enhancement and creation will be those listed as of principal importance (i.e. priority species and habitats) highlighted within the UK and Essex Biodiversity Action Plans.*”

2.4 Local Biodiversity Action Plan Species

- 2.4.1 The Essex Biodiversity Action Plan (BAP) (1-9) sets out species and habitat action plans within Essex and provides the local nature conservation strategy for identifying threats to species within this county and sets out the actions necessary to conserve them. The Essex BAP provides context to inform the identification of threatened and, or uncommon species and habitat within the district and, or county. The Essex BAP also identify priorities for conservation and enhancement but confers no particular legislative or policy protection to the species and habitat identified, however in some cases this is provided through related legislation and local planning policy.
- 2.4.2 The Essex BAP lists 25 species and 10 habitat action plans (Ref 10). This includes three flora species and three habitats of potential relevance to the Order limits. Actions and targets are discussed where relevant to the Scheme in the discussion and conclusions sections (Sections 5 and 6).

Species

- a. Black Poplar
- b. Oxlip (*Primula elatior*); and
- c. Hog`s Fennel (*Peucedanum officinale*).

Habitats

- a. Ancient and/or species rich hedgerows and green lanes;
- b. Ancient woodland (including veteran trees); and
- c. Arable field margins.

3. Methods

3.1 Desk Study

- 3.1.1 A desk study to obtain records of relevant flora (including lower plant species such as mosses, ferns and fungi) records was undertaken in July 2021 in the PEA (**Appendix 8B** of the ES) and January 2021 through Essex Field Club within a minimum 2km radius of the Order limits (see **Appendix 8L: Essex Field Club Desk Study** of the ES [EN010118/APP/6.2]). This included:
- Protected Plants under Schedule 8 Wildlife and Countryside Act 1981 (as amended);
 - Priority Species (*i.e.* LBAP / NERC Act Section 41 species);
 - Great Britain Red List species (IUCN);
 - Notable species (*i.e.* Nationally Rare and Scarce species);
 - Essex Red List Species (Ref 11); and
 - Invasive non-native plant species.
- 3.1.2 Only records up to ten years old were considered within the assessment, as any records older than ten years are unlikely to be still representative of plant communities in the local area.

3.2 Field Survey

Survey Area

- 3.2.1 The survey area comprised all arable field margins within the Order limits, areas of semi-improved grassland, (including set-aside, road/track verges) and selected hedgerows (based on possible direct impacts) within the Order limits. These are shown in Figure 1 of Annex A - Figures and referenced in **Table 1**. Other incidental records are included where plant species were recorded during other ecology surveys throughout 2020.

Table 1: Survey areas within the Order limits

Habitat type	Survey Area Reference (see Figure 1)
Arable Flora/Arable Field Margins *#	All arable fields within the Order limits. AF1, AF2, AF3 with Important Arable Species and subject to survey.
Hedgerows *#	Selected hedges along possible cable route only - H1, H2, H3, H4, H5, H6.
Semi-improved neutral grassland (including set-aside grassland and roadside verges)	G1, G2, G3, G4, G5.
* indicates a priority habitat type; # indicates a Local Biodiversity Action Plan habitat in Essex	

Arable Flora Survey

- 3.2.2 All suitable, accessible arable fields in the Order limits were assessed and surveyed for important arable plant species on the 17th June and 9th September 2020 at an optimal time of year for recording such species. The distribution of scarce arable plant species in the modern agricultural landscape is largely confined to arable field margins and similar areas of less intensive management. As such, the survey involved walking field boundaries and comparable areas of marginal habitat only.
- 3.2.3 Lists of rare or scarce arable plant species were recorded for each field surveyed based on Plantlife's Important Arable Plant Areas Outstanding Assemblages (Criterion B) (Ref 12). Criterion B for outstanding assemblages utilises the same methodology for identifying sites of County, National and European Importance. This is a scoring system that tallies the weighted individual score for each of the species present according to their rarity and decline across Britain. The basic listing of arable species has been drawn from PLANTATT: Attributes of British and Irish Plants (Ref 13), which provides the most comprehensive listing of species characteristic of arable land currently available. This has been supplemented with a selection of additional species considered to occur occasionally as characteristic members of the arable flora. It was not the intention of the survey to record all arable plant species present, only those listed in the Great Britain (Ref 14) and England (Ref 15) Red Data Lists as Critically Endangered, Endangered, Vulnerable and Near Threatened, and those listed by Byfield & Wilson as locally, regionally or nationally scarce (Ref 16). As such, data were only collected for those fields where scarce flora was found.
- 3.2.4 The survey results were used to determine the relative notability and importance of any scarce arable plant assemblages present. Byfield and Wilson (Ref 16) set thresholds to support this and subsequent nature conservation evaluation. Thresholds have been defined based on the cumulative total of the weighted scores of species present at each discrete location (in this case per field location). The threshold scores proposed for sites of international (European), national and county importance are detailed below in **Table 2**.
- 3.2.5 The scoring system recognises that arable communities on a particular geological substrate may consistently score either more or less than equally valued communities on a different substrate. According to data held in the Multi-Agency Geographic Information for the Countryside (MAGIC) website the predominant soil classification within fields AF2 and AF3 is 'Soilscape Type 6: Freely draining slightly acid loamy soils and at field AF1 Type 8: slightly acid loamy and clayey soils with impeded drainage'. Therefore, the most appropriate substrate type, is "Clays" for AF1 and Sand and Freely Draining Acidic Soils in AF2 and AF3 (as presented below in **Table 2**).
- 3.2.6 No criteria are available for the identification of assemblages of lower value/biodiversity importance. Professional judgement has been applied to this site, based on the nature of the species assemblage recorded.

Table 2: Threshold scores for assessing the conservation importance of arable plants at the field level with reference to prevailing soil type (Ref 16)

	Chalky and limestone derived free-draining calcareous soils	Clay and slowly impermeable soils (inc. calcareous clays)	Sandy loams, shale and free-draining soils
Site field reference (AF), see Figure 1:	Not applicable	AF1	AF2, AF3
International (European)	45+	40+	45+
National	25-44	25-39	30-44
County	15-24	15-24	15-29

Hedgerow Survey

- 3.2.7 Hedgerow surveys were carried out on 16th June and 10th July 2020, in accordance with the standard methods (Ref 6). The survey area included only those hedgerows along the route of the possible cable corridor to the north of the Order limits, with their locations shown on Figure 1, Annex A - Figures. It is currently assumed all other hedges will be retained and protected during the Scheme.
- 3.2.8 The survey of each hedgerow for ‘importance’ were assessed against the Wildlife and Landscape Criteria, detailed in the Regulations (see Annex B – Hedgerow Regulations and Schedules). The identified hedgerows were not assessed against the history and archaeology criteria of the Regulations as these criteria are not within the professional remit of an ecologist.
- 3.2.9 As detailed within the Regulations, in Essex a hedgerow is ‘Important’ for wildlife and landscape if it is at least 30 years old and:
- a. Has at least seven qualifying woody species (Schedule 3; Annex B – Hedgerow Regulations and Schedules) present; or
 - b. Has at least six qualifying woody species and meets at least 3 of the criteria (Schedule 1; Annex B – Hedgerow Regulations and Schedules); or
 - c. Has at least six qualifying woody species that include one of the following:
 - d. Black Poplar;
 - e. Large-leaved Lime;
 - f. Small-leaved Lime; or
 - g. Wild Service-tree (*Sorbus torminalis*).

Grassland Survey

- 3.2.15 Apart from arable field margins and hedgerows, no other terrestrial priority habitats were identified within the Scheme. This survey of grassland focused on providing more detail on the species present within semi-improved neutral grassland (including set-aside grassland and roadside verges). This was undertaken to identify any notable species and species composition of the grassland to help inform mitigation, habitat compensation and enhancement proposals.
- 3.2.16 The survey was undertaken by an experienced botanist on 9th, 17th and 23rd June 2020. Notes were made on the species and abundance within each area, using the DAFOR scale (D=Dominant, A=Abundant, F=Frequent, O=Occasional, R= Rare).
- 3.2.17 The rarity of higher plants given is based on Stace (2019) (Ref 2), where;
- Uncommon – a species found in not more than 250 different 10 x 10km grid squares in the British Isles since 1987;
 - Scarce - a species found in not more than 100 different 10 x 10km grid squares since 1987; and
 - Rare – a species found in not than 15 different 10 x 10km grid squares since 1987.
- 3.2.18 Protected species (Wildlife and Countryside Act Schedule 8), priority species (S41) and notable species as listed on the Essex Red List are listed in the results.

Invasive Plant Species and Other Records of Protected or Notable plants

- 3.2.19 During the Phase 1 habitat surveys (see **Appendix 8B: PEA** of the ES) and surveys of habitats reported here in June and July 2020, the Order limits was surveyed for the presence of invasive non-native plant species listed on Schedule 9 of the Wildlife & Countryside Act 1981 (as amended) including Japanese Knotweed (*Reynoutia japonica*), Giant Hogweed (*Heracleum mantegazzianum*) and Indian Balsam (*Impatiens glandulifera*). A list of incidental records of other protected or notable plants species and their locations recorded in 2020 within the Order limits are listed.

3.3 Biodiversity Evaluation

- 3.3.1 An essential prerequisite step to allow ecological impact assessment of the Scheme is an evaluation of the relative biodiversity importance of the identified ecological features (encompassing nature conservation designations, ecosystems, habitat and species). This is necessary to set the terms of reference for the subsequent ecological impact assessment.
- 3.3.2 The method of evaluation that has been utilised has been developed with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) (Ref 17) (see Annex C – Importance of Ecological Features Criteria). This gives guidance on scoping and carrying out environmental assessments and places appraisal in the context of relevant policies. Data received through consultation, desk-based studies and field-based surveys are used to allow ecological features of biodiversity importance

or potential importance to be identified, and the main factors contributing to their importance described and related to available guidance.

- 3.3.3 Habitats and their component plant species can be of biodiversity importance for a variety of reasons, and their relative importance should always be determined on a case-by-case basis. Importance may relate, for example, to the uniqueness of the assemblage, or to the extent to which species are threatened throughout their range, or to their rate of decline.
- 3.3.4 The importance of the habitats and plant species addressed in this report has been defined with reference to the geographical level at which the feature being assessed is considered to matter. Relevant published national and local guidance and criteria can be used, where available, to inform the assessment of biodiversity importance and to assist consistency in evaluation.
- 3.3.5 The identified guidance and criteria are not definitive and other criteria have been applied when relevant and appropriate, e.g. see the method for Important Arable Plant Areas referenced above in Section 3.2. In the case of assessing the value of county important habitats such as hedgerows and grassland guidance in Local Wildlife Site Selection Criteria has been followed (Ref 18).

3.4 Assumptions and Limitations

- 3.4.1 These limitations did not significantly limit the outcomes/conclusions made within this flora report and assessment. Ecological data in relation to habitats and flora species are valid for 18 months to 2 years based on best guidance (CIEEM, 2019) (Ref 19).

Desk Study

- 3.4.2 The aim of a desk study was to help characterise the baseline context of the Scheme and provide valuable background information that would not be captured by site surveys alone. Information obtained during the course of a desk study was dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for a particular habitat or species does not necessarily mean that the habitats or species do not occur in the study area. Likewise, the presence of records for particular habitats and species did not automatically mean that these still occurred within the area of interest or were relevant in the context of the Scheme.

Field Survey

Survey areas and access

- 3.4.3 Survey areas were chosen to provide a representative sample of the Order limits, based on the best quality in terms of potential species diversity and potential for protected or notable flora species which could be impacted as a result of the Scheme. All arable margins were considered and surveyed where rare/scarce arable flora were present or likely to be present.
- 3.4.4 These surveys concentrated on habitats likely to be directly impacted, and therefore, not all habitats were surveyed in detail. Note that since the surveys in 2020, the Scheme boundary has been amended, resulting in some areas where the survey results are outside the Scheme. This is not a significant

limitation as the data are still useful for assessing impacts from the Scheme and providing species information for mitigation and enhancement.

- 3.4.5 Invasive plant species were recorded where present within the terrestrial habitats surveyed. It should be noted that a survey of aquatic invasive non-native species within the Order limits (along the River Ter and ponds), has not been undertaken in this report, incidental records of note have been included, but these species are included (where present) in the Aquatic Ecology Report (**Appendix 8D: Aquatic Ecology Survey Report** of the ES [EN010118/APP/6.2]).

Arable flora

- 3.4.6 There were some general limitations specific to surveys for scarce arable flora.
- 3.4.7 The surveys were undertaken in mid-June, which represents the optimum time for recording scarce arable flora. However, not all arable plant species and populations may be apparent or identifiable during this period. Some later checks were also undertaken in early September for additional species, therefore most of the scoring or more notable species were likely to have been apparent at these times.
- 3.4.8 Use of selective herbicides on crops observed throughout the year will have restricted the occurrence of scarce arable flora to areas unaffected by spray, such as field entrances/turning areas.
- 3.4.9 Not all crops are of equal value for scarce arable flora. Crops of the same type are not grown in the same fields year after year *i.e.* they are rotated on a regular cycle. Some crop types are more compatible than others with arable flora, depending upon the specific inputs required to maintain the crop (*e.g.* herbicides and fertilisers) and how closely the cultivation requirements of the crop matches the ecological requirements of the scarce flora present.

Grassland & hedgerow survey

- 3.4.10 The grassland and hedgerow surveys were undertaken at an appropriate time of year during June to July and under suitable weather conditions for such survey. However, it should be noted that grassland survey results, and the description of communities/community's types (where applicable), represent a current evaluation at the time of survey (as opposed to one seeking to describe what the community was before any human interference, or what it might become in the future). This is only a snapshot of the vegetation communities present and should not be interpreted as a static long-term reference.
- 3.4.11 It was not possible to determine the presence or absence of all potential notable/protected plant or animal species associated with the hedge (one of the criteria for assessing 'important' hedgerows). Existing field data (*e.g.* Barn Owl (*Tyto alba*) and Badger (*Meles meles*) survey), field signs during the hedgerow survey and desk study data was used to help inform this assessment.

4. Results

4.1 Desk Study

- 4.1.1 The data search results returned 167 records of 36 species of notable flowering plants and one fungus (*Boletus satanas*). The full results are in the PEA **Appendix 8B: PEA** and **Appendix 8L: Essex Field Club Desk Study** of the ES. A summary is provided here.
- 4.1.2 None of the species recorded in the data search were from within the Order limits, although based on the 500m resolution of the data, they are likely to be close to the Order limits.
- 4.1.3 Bluebell (*Hyacinthoides non-scripta*) is the only Schedule 8 plant of the Wildlife and Countryside Act 1981 (in respect of Section 13.2a/b only, see Section 2.1) that is relevant to the Scheme within 2km of the Order limits. This species is present in some of the ancient woodlands located just outside the Order limits, including Sandy Wood and Toppenhoehall Wood.
- 4.1.4 Two species recorded are Nationally Scarce species; Lesser Calamint (*Clinopodium nepeta*) and Large-leaved Lime. The record of Lesser Calamint is potentially in suitable habitat identified on road verges just outside the Order limits boundary close to Noakes Farm. Large-leaved Lime is within Toppenhoehall Wood to the south of the Order limits.
- 4.1.5 The data search returned 91 records of 19 species of invasive plants including; New Zealand Pigmyweed (*Crassula helmsii*), Japanese Knotweed, Giant Hogweed, Spanish Bluebell (*Hyacinthoides hispanica*), Floating Pennywort (*Hydrocotyle ranunculoides*) and Indian Balsam. None of these were recorded within the Order limits, with Spanish Bluebell close to the Order limits in the 1km square south of Noakes Farm, potentially in woodland and/or roadside verges. New Zealand Pigmyweed was recorded west of the Order limits in a large fishing lake near Russell Green and confirmed through Great Crested Newt (*Triturus cristatus*) scoping surveys at this lake in 2020.

4.2 Arable Flora

- 4.2.1 The margins of all accessible arable fields within the Order limits were searched for species of important arable plants. Three arable fields (AF1 to 3, see Figure 1, in Annex A - Figures) were found to contain scarce arable flora and were surveyed. A summary of the results is given in **Table 3** with field locations and results shown on Figure 1, Annex A - Figures and in Annex D – Survey Results. All other fields within the Order limits were either not in cultivation, e.g., improved grassland, or had no potential or visible arable plants, e.g., sown field margins that are not included in the method, or sprayed margins.
- 4.2.2 In accordance with the method, all three fields were rated to be of local importance for important arable plants. All the other arable fields within the Order limits are assessed as of site importance. Five species of important arable plants were recorded in the fields surveyed. This included one higher scoring species (7+): Corn Chamomile (*Anthemis arvensis*), which is classified as Endangered in the Red Lists for UK and England (Ref 14 and Ref 15). All

other scoring species in **Table 3** are listed as Least Concern in the Red Lists for UK and England.

Table 3: Results of the survey for important arable plants

Field	Area of field (ha)	Soil type	Crop	Score and Geographic Importance	Species present with DAFOR* abundance rating and score
AF1	42.6ha	Clays	Oil-seed rape	Local (10)	Corn Chamomile (<i>Anthemis arvensis</i>) R (score 8) - 1 plant at TL7585 1230 Fig-leaved Goosefoot (<i>Chenopodium ficifolium</i>) R (score 2)
AF2	11.4ha	Sandy loam	Potatoes	Local (7)	Fig-leaved Goosefoot (<i>Chenopodium ficifolium</i>) O (score 2) Many-seeded Goosefoot (<i>Lipandra polyspermum</i>) F (score 2) Round-leaved Fluellen (<i>Kickxia spuria</i>) R (score 3)
AF3	3.1ha	Sandy loam	Wheat	Local (7)	Many-seeded Goosefoot (<i>Lipandra polyspermum</i>) F (score 2) Sharp-leaved Fluellen (<i>Kickxia elatine</i>) R (score 2) Round-leaved Fluellen (<i>Kickxia spuria</i>) R (score 3)

* D= Dominant, A= Abundant, F= Frequent, O=Occasional, R= Rare

4.2.3 Other arable plant species, not listed as 'important' included Sterile Brome (*Anisantha sterilis*), Smooth Brome (*Bromus racemosus*), Scentless Mayweed (*Tripleurospermum inodorum*), Scented Mayweed (*Matricaria chamomilla*), Common Ragwort (*Jacobaea vulgaris*), Hedge Mustard (*Sisymbrium officinale*), Annual Nettle (*Urtica urens*), Cut-leaved Crane's-bill (*Geranium dissectum*), Common Couch (*Elymus repens*), Cleavers (*Galium aparine*), Fat-hen (*Chenopodium album*), Prickly Sow-thistle (*Sonchus asper*), Hemlock (*Conium maculatum*), Redshank (*Persicaria maculosa*) and Creeping Thistle (*Cirsium arvense*).

4.3 Hedgerows

4.3.1 The hedgerows surveyed within the Order limits during the field survey are presented in Figure 1, Annex A - Figures. Full results and photos are provided in Annex A - Figures and are summarised below and in **Table 4**.

4.3.2 Hedgerows within the Order limits are generally intact and species rich (over five woody species), with species including Field Maple (*Acer campestre*), Common Hawthorn (*Crataegus monogyna*), Spindle (*Euonymus*

europaeus), Blackthorn (*Prunus spinosa*), Guelder Rose (*Viburnum opulus*), Elder (*Sambucus nigra*), Hazel (*Corylus avellana*), Wild Service Tree, Midland Hawthorn (*Crataegus laevigata*), Hornbeam (*Carpinus betulus*), Small leaved-lime, Crab Apple (*Malus sylvestris*) and Elm (*Ulmus* species). Many contain standard trees, including mature, veteran or ancient Oak (*Quercus robur*) trees, some with woodland ground flora species such as Lord's-and-ladies (*Arum maculatum*), Dog's Mercury (*Mercurialis perennis*) and Wood False-brome (*Brachypodium sylvaticum*) and dry ditch features.

4.3.3 Most hedges, other than along roads had a lack of regular management resulting in hedgerows of varying sizes and structure. The majority of hedgerows recorded were well connected with other habitats of high biodiversity value, including a wider network of hedgerows, as well as woodland habitats and ponds.

Important Hedgerows

4.3.4 Of the six specific hedgerows surveyed for the purposes stated in the Method (Section 3.2), four hedgerows (H1, H3, H4 and H5) were classified as 'Important' in terms of landscape and wildlife criteria under the Regulations (1-20). Two hedgerows were classified as not 'Important' (see **Table 4**).

Table 4: Summary of the hedgerow survey results

Hedgerow	Length (m)	Mean number of qualifying woody species	Number of associated features	Public Right of Way running Parallel?	Important Hedgerow?	Species-rich?
H1	196m	6.5	2	Yes	Yes	Yes
H2	52m	6	2	No	No	Yes
H3	420m	7	4	No	Yes	Yes
H4	280m	5.33	5	No	Yes	Yes
H5	204m	4.5	3	Yes	Yes	No
H6	195m	5.5	3	No	No	Yes

Species-rich Hedgerows

- 4.3.5 Five hedgerows (H1, H2, H3, H4 and H6) were classified as species rich **Table 4**). Two hedgerows (H4 and H6) contained the minimum number of woody species to be classified as species rich (Ref 6), with five native woody species per 30m survey section, with two hedgerows (H1 and H2) containing six woody species, one (H3) containing seven species. The other hedgerow H5 is classed as species poor (containing less than five woody species).
- 4.3.6 Woody species more commonly found included Field Maple, Pedunculate Oak, Common Hawthorn, Spindle, Blackthorn, Elder, Hazel and Elm.

4.4 Grassland

- 4.4.1 A summary of the results of the grassland flora survey is provided below in **Table 5**. Locations are shown on Figure 1, Annex A - Figures, with photos in Annex D – Survey Results.
- 4.4.2 Grasslands surveyed within the Order limits comprised selected species rich and uncut road-verges; G1, G2, G5, set-aside and recent/sown origin grassland; G3, G4, G6, and a grass bank adjacent to a hedge; G7. All the grassland has affinities to National Vegetation Community MG1 *Arrhenatherum elatius* grassland, a community type that is ubiquitous throughout lowland Britain (Ref 21). Due to the inherent nature of road verges and banks there is influence from adjacent woodland and ditch species.

Table 5: Results of the grassland flora survey

Survey Area (see Figure 1)	Length (m)/ Area (ha)	Date	Description and Abundance (DAFOR*)
G1	90m	17 th June 2020	A gravel section of track south of Ridley Lane with 1 to 2m wide semi-improved grass banks either side of the road. Species include False Oat-grass (<i>Arrhenatherum elatius</i>) (F), Wood False-brome (F), with occasional Dog's-mercury, Red Campion (<i>Silene dioica</i>), Garlic Mustard (<i>Alliaria petiolata</i>), Cock's-foot (<i>Dactylis glomerata</i>), Grey Sedge (<i>Carex divulsa</i> subsp. <i>divulsa</i>), Wood Avens (<i>Geum urbanum</i>), Black Horehound (<i>Balota nigra</i>), Cow Parsley (<i>Anthriscus sylvestris</i>) and Common Agrimony (<i>Agrimonia eupatoria</i>).
G2	134m	17 th June 2020	Road verges up to 5m wide, similar species to G1 with False Oat-grass (A) with additional Wild Onion (<i>Allium vineale</i>) (R), Musk Mallow (<i>Malva mochata</i>) (O) and Red Fescue (<i>Festuca rubra</i> aggregate) (O).
G3	1.4ha	17 th June 2020	Set-aside semi-improved grassland. Dominated by False Oat-grass, with occasional Smooth Tare (<i>Ervum tetraspermum</i>), Bird's-foot Trefoil (<i>Lotus corniculatus</i> var <i>sativus</i>) Creeping Thistle, Spear Thistle (<i>Cirsium vulgare</i>), Rough Meadow-grass (<i>Poa trivialis</i>), Yorkshire Fog (<i>Holcus lanatus</i>), Smooth Brome, Hedge Bedstraw (<i>Galium album</i>), Creeping Buttercup (<i>Ranunculus repens</i>), Selfheal (<i>Prunella</i>

Survey Area (see Figure 1)	Length (m)/ Area (ha)	Date	Description and Abundance (DAFOR*)
			<i>vulgaris</i>), Lesser Trefoil (<i>Trifolium dubium</i>) and Ash and Field Maple tree seedlings.
G4	3.0ha	26 th June 2020	Estimate 2 to 3 year old set-aside grassland dominated by False Oat-grass (D), with Hogweed (O), Goat Willow (R), Rosa species (R), Bird's-foot Trefoil (O), Common Bent (<i>Agrostis capillaris</i>) (O), Creeping Buttercup (O), Creeping Thistle (F), Ox-eye Daisy (<i>Leucanthemum vulgare</i>), Common Cat's-ear (<i>Hypochaeris radicata</i>), Yorkshire Fog (O), Soft Brome (<i>Bromus hordeaceus</i> subsp. <i>hordeaceus</i>) (R), Selfheal (R), Field Bindweed (<i>Convolvulus arvensis</i>), Broad-leaved Dock (<i>Rumex obtusifolius</i>) (R), Cock-s-foot (O), Perennial Rye-grass (<i>Lolium perenne</i>) (O), Soft Rush (<i>Juncus effusus</i>), Dog Rose (<i>Rosa canina</i> aggregate), Red Fescue (O), Creeping Bent (<i>Agrostis stolonifera</i>), Meadow Fescue (<i>Schedonorus pratensis</i>) (R) and American Willowherb (<i>Epilobium ciliatum</i>) (R).
G5	210m	26 th June 2020	Semi-improved grassland road verge and dry ditch up to 5m wide. Species rich grassland species include False Oat-grass (A), Hogweed (F), Cock's-foot (F), Wood False-brome (F), Common nettle (<i>Urtica dioica</i>) (F), Creeping Thistle (F), Common knapweed (<i>Centaurea nigra</i>) (O), Greater Stitchwort (<i>Stellaria holostea</i>) (O), Hedge Stitchwort (O), Clustered Dock (<i>Rumex conglomeratus</i>) (O), Smaller Cat's-tail (<i>Phleum bertolonii</i>) (O), Meadow Vetchling (<i>Lathyrus pratensis</i>) (R), Yarrow (<i>Achillea millefolium</i>) (O), Remote Sedge (<i>Carex remota</i>) (R), Field Bindweed (O), Cow Parsley (O), Hedge Woundwort (<i>Stachys sylvatica</i>) (O), Common Couch (R), Perforate St.John's-wort (<i>Hypericum perforatum</i>) (O), Nipplewort (<i>Lapsana communis</i>) (O), Red Campion (R), Cleavers (O), Agrimony (R), Timothy (<i>Phleum pratense</i>) (O), Creeping Buttercup (O) and Ribwort Plantain (<i>Plantago lanceolata</i>) (O). The dry ditch is dominated by Great Willowherb (<i>Epilobium hirsutum</i>) (A), with Bulrush (<i>Typha latifolia</i>) (O) and grassland species as above.
G6	1.2ha	26 th June 2020	A large area of temporary set-aside/bird seed mixture grassland. Ploughed and removed by October 2020. Species included False Oat-grass (A), Reed Canary-grass (<i>Phalaris arundinacea</i>) (A) Canary-grass (<i>Phalaris canariensis</i>) (O), Chicory (<i>Cichorium intybus</i>) (O), Hogweed (O), Creeping Thistle (O), Smooth Tare (R), Ribbed Melilot (<i>Melilotus officinalis</i>), Common century (<i>Centaureum erythraea</i>) (R) and Hairy St-John's-wort (<i>Hypericum hirsutum</i>).
G7	0.1ha	9 th June 2020	A grass bank adjacent to a mature species rich hedge (H4). This habitat comprising semi-improved grassland including False Oat-grass (A), Creeping Bent (O), Rough Meadow-grass (F), Smooth Brome

Survey Area (see Figure 1)	Length (m)/ Area (ha)	Date	Description and Abundance (DAFOR*)
			(O), Common Ragwort (O), Creeping Thistle (O), Perennial Rye-grass (O), Black Horehound (O), Cock's-foot (O), Red Fescue (O), Sterile Brome (O) and Wild Onion (R).
*D= Dominant, A= Abundant, F= Frequent, O=Occasional, R= Rare			

4.5 Invasive and Other Notable Species Records

4.5.1 No invasive (Wildlife and Countryside Act Schedule 9) plant species were noted during the surveys within the Order limits. Due to their inherent invasive nature the possibility in the future of Schedule 9 species within the Order limits cannot be ruled out.

4.5.2 No other notable plant species were recorded during the surveys.

5. Discussion and Evaluation

5.1 Nature Conservation Evaluation

Introduction

5.1.1 An evaluation of the biodiversity importance of flora and habitats in relation to the Scheme is described below and summarised in **Table 6** (see Figure 1, Annex A - Figures). Potential outline impacts and effects on these habitats are discussed here.

Arable Flora

5.1.2 Three arable fields (AF1, AF2 and AF3) supported important arable plant assemblages of local importance based on established criteria. These assemblages enrich the habitat resource and are of value within the local context (*i.e.* within 5km of the Order limits). All other arable fields are of site importance for important arable plant assemblages due to the absence of notable arable species.

Hedgerow Biodiversity Importance

5.1.3 Based on guidance in Local Wildlife Site (LoWS) Selection Criteria for assessing habitats of county importance (Ref 18) under Habitat Criterion 8 (HC8) – Hedgerows and Green Lanes, hedgerow H4 is assessed as of district/county importance. This is because it contains the following criteria eligible for selection as a LoWS:

- a. It is species-rich with up to 9 woody species and contains woodland ground flora and adjacent grassland/bank flora that includes notable species (see Grassland F7);
- b. It supports a high density of very large or veteran standard trees;
- c. The hedgerow provides a valuable wildlife corridor from hedgerows and woodlands to the north to the River Ter and ancient woodland in the south assisting the dispersal of wildlife through the open countryside; and
- d. It contains trees with features of high suitability for roosting bats (a protected species).

5.1.4 All of the other hedgerows surveyed (H1, H2, H3, H5 and H6) are of local importance and are examples of the NERC Act s41 habitat, which encompasses all predominantly (greater than 80%) native hedgerows regardless of their “importance” or species-richness. Together the hedgerows within and adjacent to the Order limits form a network that helps link other wooded habitats in the surrounding landscape. Each hedgerow contributes to an ecological network of greater biodiversity importance than its individual component hedgerows. Regardless of their importance under the Hedgerow Regulations, are only likely to be of greater than district importance if they are an integral part of valuable ecological networks or are critical for the survival of populations of flora or fauna that are themselves of above district value.

5.1.5 Although only specific hedgerows on Order limits have been surveyed (*i.e.* those subject to potential impacts), those surveyed are typical of the hedgerows within the wider Order limits. As such, it is considered that the

hedgerow network present on the Order limits, is likely to be of district/county importance. This evaluation takes into account the number of hedges covering a large area of landscape, the hedgerow species composition, richness and associated features (e.g. the presence of mature trees and protected species within these hedgerows, e.g. including potential bat and Barn Owl roosts), and an assessment against priority habitat criteria.

Grassland Biodiversity Importance

- 5.1.6 No notable or protected species were found during the grassland survey and all grassland has affinity to a ubiquitous and widespread grassland community type MG1 *Arrhenatherum elatius* grassland (Ref 21). The set-aside grassland fields (G3, G4 and G6), whilst providing a valuable resource for biodiversity (such as invertebrates and foraging birds) are of limited biodiversity importance due their recent or sown origin and can be readily re-created if required. These are assessed as of site importance. Other grassland comprising road verges (G1, G2) and a grass bank adjacent to a hedge (G7) are of site importance based on their species composition. One road verge (G5) has a higher species diversity with some wetland and woodland species. It is considered to enrich the habitat resource and be of value within the local context and is assessed as local importance.
- 5.1.7 All other grassland within the Order limits was either improved grazed or species poor and assessed of site importance.

Invasive and Other Notable Species

- 5.1.8 No invasive plants were recorded within the Order limits.
- 5.1.9 Bluebell (*Hyacinthoides non-scripta*) is the only protected plant that is relevant to the Scheme within 2km of the Order limits. Two Nationally Scarce species; Lesser Calamint and Large-leaved Lime were present close to the Scheme during the desk study. These species add to the local habitat resource and are assessed as local importance.

Table 6: Summary of biodiversity importance

Survey	Feature Reference	Importance
Arable Flora	AF1, AF2, AF3	Local
	All other arable fields	Site
Hedgerow	H4	District/county
	H1, H2, H3, H5 and H6	Local
Grassland	G5	Local
	G1, G2, G3, G4, G6, G7	Site
Protected/notable species	Bluebell, Lesser Calamint and Large-leaved Lime.	Local

5.2 Potential Impacts

- 5.2.1 The primary purpose of this report is to provide an assessment of the biodiversity importance of the flora identified within the Scheme to inform the ES (see Section 1.1). An assessment of potential impacts (considering embedded mitigation), any additional mitigation and residual effects has been undertaken in **Chapter 8: Ecology** of the ES.
- 5.2.2 The impact assessment process will involve:
- Identifying and characterising impacts and their effects;
 - Incorporating measures to avoid and mitigate negative impacts;
 - Assessing the significance of any residual effects after mitigation;
 - Identifying appropriate compensation measures to offset; and
 - Identifying opportunities for ecological enhancement.
- 5.2.3 The assessment of impacts will consider the baseline conditions reported in this technical appendix (pending any updates) to allow:
- A description of how the baseline conditions will change as a result of the project and associated activities; and
 - The identification of cumulative impacts arising from the proposal and other relevant developments.
- 5.2.4 Construction impacts are likely to be similar to other large-scale developments with habitat changes and losses, noise, dust and lighting disturbance during construction and decommissioning works (Ref 22). Operational impacts and resulting effects will be based on the changes to habitats over time and the likely response of individual species. This will also require monitoring to improve confidence in the assessment of residual adverse or beneficial effects, to feedback into the landscape management plan and to provide a dataset for future large scale solar schemes.
- 5.2.5 The potential impacts are summarised as follows:
- Disturbance to habitats and plant species from dust and lighting;
 - Loss of habitats and plant species (agricultural land and grassland) to the Scheme infrastructure (i.e. solar panels, substation, battery storage, control/junction boxes, access roads);
 - Potential beneficial impacts from arable to grassland/grazing land (potentially cut or grazed); and
 - Potential beneficial impacts through a possible reduction in pesticide use on crops within the local area resulting in an increase in important arable plants and pollinators.
- 5.2.6 All adjacent habitats such as ancient woodland, the River Ter and ponds will be protected and buffered from the Scheme. All hedges are likely to be retained and buffered from any development by 15m, with possible cable routes through or under short sections of hedgerows. Following installation of the cable route any hedgerow loss would be re-instated through new planting. Arable fields of up to local importance within the Scheme will be impacted, although this may be beneficial, at least in the short term for arable flora, due

to increased soil disturbance and the additional field margins/edge habitat created. Some grassland set-aside areas are likely to be lost are relatively easy to replace as some are ploughed and sown each year, and these could be compensated for elsewhere on Order limits. Road verges are likely to be retained and access routes will need to ensure they are not damaged by an increase in traffic.

- 5.2.7 Invasive non-native plant species such as New Zealand Pigmyweed present in nearby lakes to the west and this species, or others, may potentially spread into suitable habitats within the Order limits, potentially on machinery used during construction.

6. Conclusions

6.1 Conclusions

- 6.1.1 The objective of this report is to determine the presence, assemblages and distribution of notable habitats and flora species within the Order limits, assign a biodiversity importance to these and identify outline potential impacts of the Scheme on flora.
- 6.1.2 Based on the Scheme layout, it is anticipated that impacts to hedgerows of up to district/county importance are likely to be avoided, with possible minor losses of small sections of hedge (estimated up to 10m length wide) for access roads, or grid/cable routes when directional drilling under hedges is not possible. Hedges will be replanted following access/cabling works. There will be a loss of semi-improved grassland and important arable plant assemblages of up to local value.
- 6.1.3 Construction impacts are likely to be similar to other large-scale developments with habitat changes and losses, noise, dust and lighting, during construction and decommissioning works. Operational impacts and resulting effects will be based on the changes to habitats over time and the likely response of plant species.

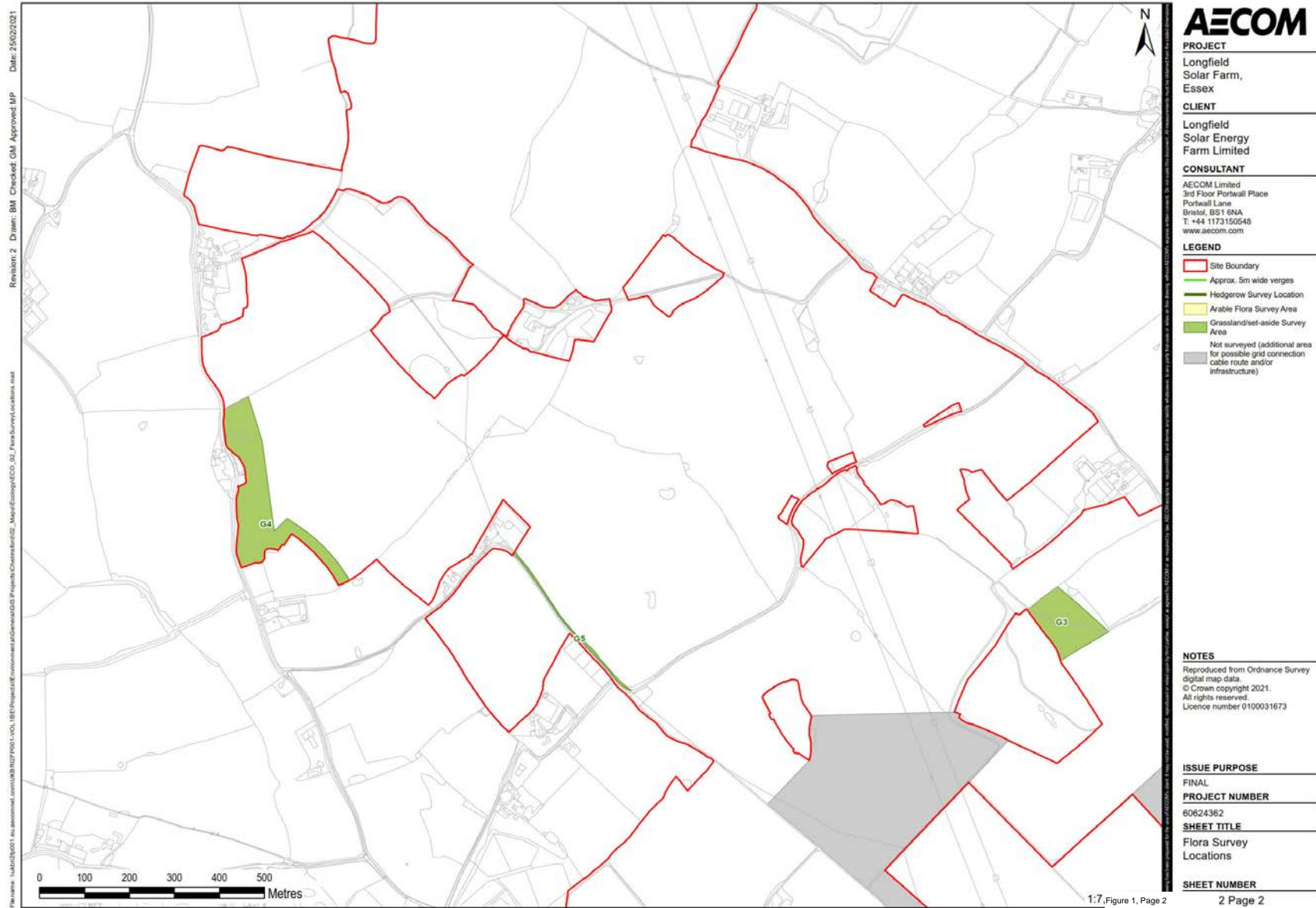
7. References

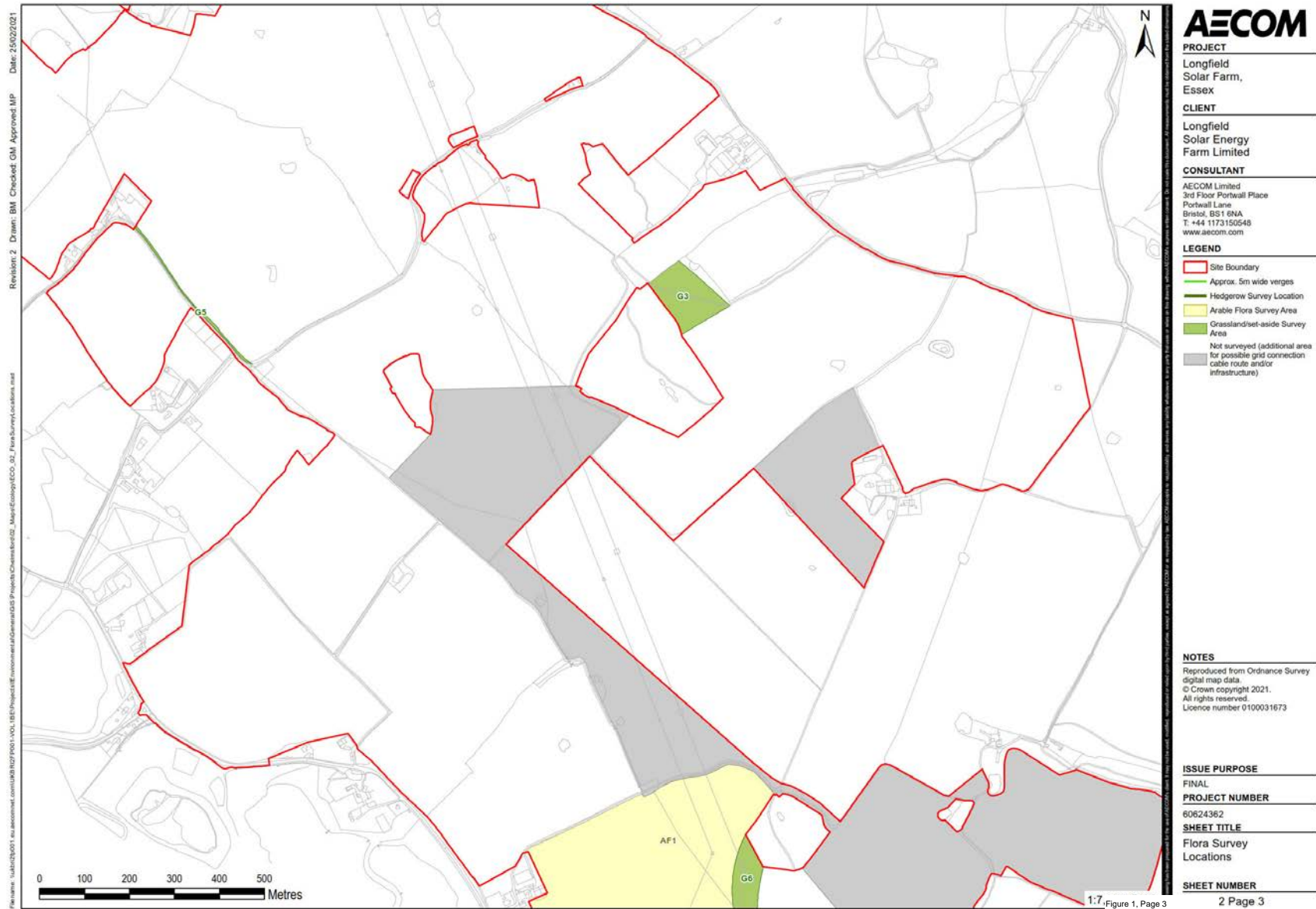
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- Ref 8 JNCC, UK Post-2010 Biodiversity Framework, 2012
- Ref 9 Essex Biodiversity Action Plan

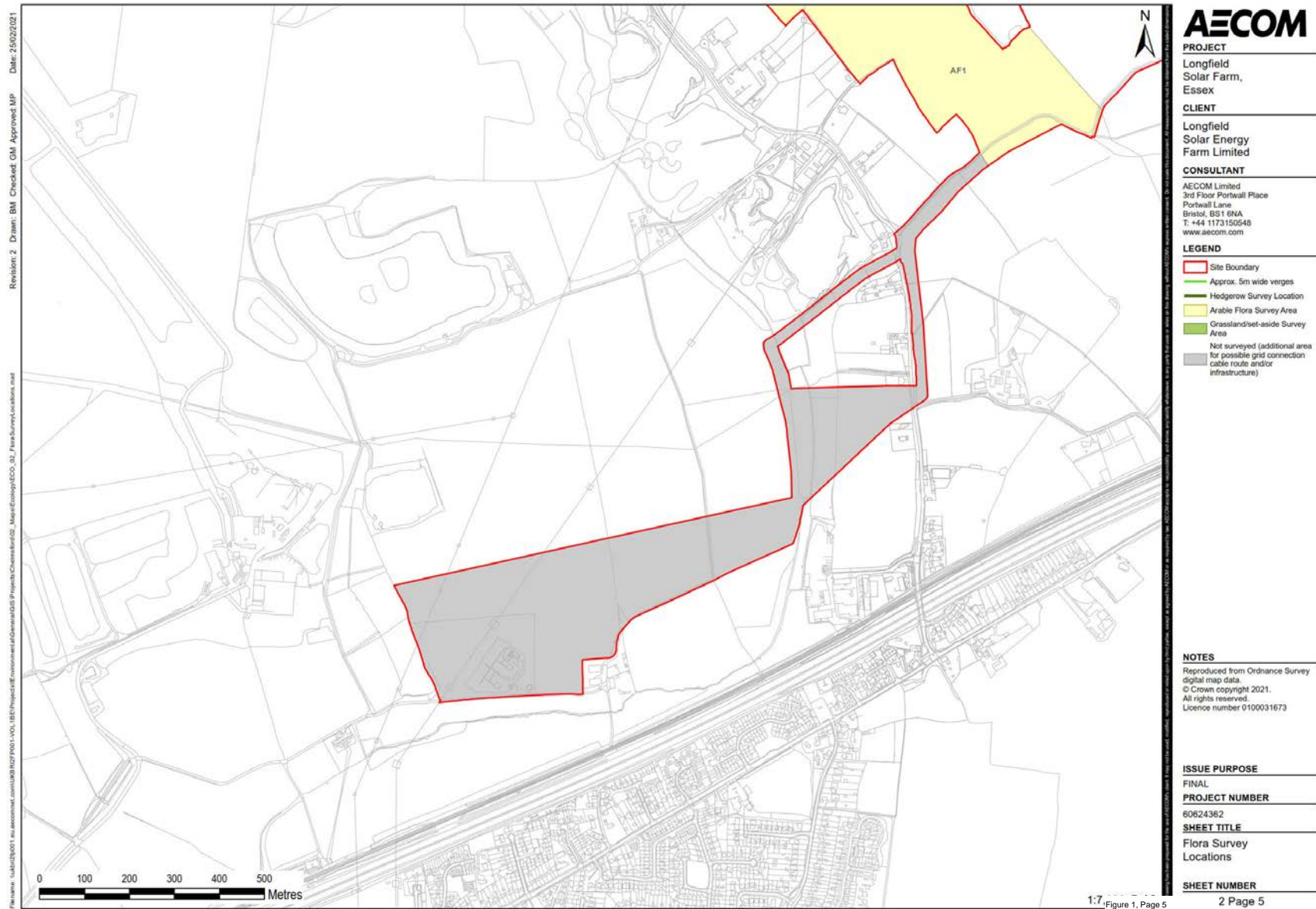
- Ref 10 Essex BAP list
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- Ref 24 BRE (2014) Biodiversity Guidance for Solar Developments. Eds G E Parker and L Greene.
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- Ref 26 Essex Biodiversity Project 2007. Integrating Biodiversity into development.
- Ref 27 Map of the Site in 1924

8. Annexes

8.1 Annex A - Figures







8.2 Annex B – Hedgerow Regulations and Schedules

The Hedgerow Regulations (1997) apply to any hedgerow growing in, or adjacent to, any common land, protected land, or land used for agriculture, forestry or the breeding or keeping of horses, ponies or donkeys, if—

- (a) it has a continuous length of, or exceeding, 20 metres; or
- (b) it has a continuous length of less than 20 metres and, at each end, meets (whether by intersection or junction) another hedgerow.

For the purposes of section 97 (hedgerows) of the Environment Act 1995 and these Regulations, a hedgerow is “important” if it, or the hedgerow of which it is a stretch,—

- (a) has existed for 30 years or more; and
- (b) satisfies at least one of the criteria listed in Part II of Schedule 1.’

Schedule 1 Part 11 Criteria: Wildlife and landscape

‘6. (1) The hedgerow—

- (a) contains species listed or categorised as mentioned in sub-paragraph (3); or
- (b) is referred to in a record held immediately before the relevant date by a biological record centre maintained by, or on behalf of, a local authority within the meaning of the Local Government Act 1972(10), and in a form recognised by the Nature Conservancy Council for England, the Countryside Council for Wales(11) or the Joint Nature Conservation Committee(12), as having contained any such species—

(i) in the case of animals and birds, subject to sub-paragraph (2), within the period of five years immediately before the relevant date.

(ii) in the case of plants, subject to sub-paragraph (2), within the period of ten years immediately before the relevant date;

(2) Where more than one record referable to the period of five or, as the case may be, ten years before the relevant date is held by a particular biological record centre, and the more (or most) recent record does not satisfy the criterion specified in sub-paragraph (1)(b), the criterion is not satisfied (notwithstanding that an earlier record satisfies it).

(3) The species referred to in sub-paragraph (1) are those—

- (a) listed in Part I (protection at all times) of Schedule 1 (birds which are protected by special penalties), Schedule 5 (animals which are protected) or Schedule 8 (plants which are protected) to the Wildlife and Countryside Act 1981(13);
- (b) categorised as a declining breeder (category 3) in “Red Data Birds in Britain” Batten LA, Bibby CJ, Clement P, Elliott GD and Porter RF (Eds.), published in 1990 for the Nature Conservancy Council and the Royal Society for the Protection of Birds (ISBN 0 85661 056 9); or
- (c) categorised as “endangered”, “extinct”, “rare” or “vulnerable” in Britain in a document mentioned in sub-paragraph (4).

(4) The documents referred to in sub-paragraph (3)(c) are—

- (a) of the books known as the British Red Data Books:
 - 1. “Vascular Plants” Perring FH and Farrell L, 2nd Edition, published in 1983 for the Royal Society for Nature Conservation (ISBN 0 902484 04 4);

2. "Insects" Shirt DB (Ed.), published in 1987 for the Nature Conservancy Council (ISBN 0 86139 380 5); and
3. "Invertebrates other than insects" Bratton JH (Ed.), published in 1991 for the Joint Nature Conservation Committee (ISBN 1 873701 00 4); and
4. "Stoneworts" Stewart NF and Church JM, published in 1992 for the Joint Nature Conservation Committee (ISBN 1 873701 24 1).

7. (1) Subject to sub-paragraph (2), the hedgerow includes—

- (a) at least 7 woody species;
- (b) at least 6 woody species, and has associated with it at least 3 of the features specified in sub-paragraph (4);
- (c) at least 6 woody species, including one of the following:
 - black-poplar tree (*Populus nigra* ssp *betulifolia*);
 - large-leaved lime (*Tilia platyphyllos*);
 - small-leaved lime (*Tilia cordata*);
 - wild service-tree (*Sorbus torminalis*); or
- (d) at least 5 woody species, and has associated with it at least 4 of the features specified in sub-paragraph (4), and the number of woody species in a hedgerow shall be ascertained in accordance with sub-paragraph (3).

(2) Where the hedgerow in question is situated wholly or partly in the county (as constituted on 1st April 1997) of the City of Kingston upon Hull, Cumbria, Darlington, Durham, East Riding of Yorkshire, Hartlepool, Lancashire, Middlesbrough, North East Lincolnshire, North Lincolnshire, Northumberland, North Yorkshire, Redcar and Cleveland, Stockton-on-Tees, Tyne and Wear, West Yorkshire or York(14), the number of woody species mentioned in paragraphs (a) to (d) of sub-paragraph (1) is to be treated as reduced by one.

(3) For the purposes of sub-paragraph (1) (and those of paragraph 8(b))—

- (a) where the length of the hedgerow does not exceed 30 metres, count the number of woody species present in the hedgerow;
- (b) where the length of the hedgerow exceeds 30 metres, but does not exceed 100 metres, count the number of woody species present in the central stretch of 30 metres;
- (c) where the length of the hedgerow exceeds 100 metres, but does not exceed 200 metres, count the number of woody species present in the central stretch of 30 metres within each half of the hedgerow and divide the aggregate by two;
- (d) where the length of the hedgerow exceeds 200 metres, count the number of woody species present in the central stretch of 30 metres within each third of the hedgerow and divide the aggregate by three.

(4) The features referred to in sub-paragraph (1)(b) and (d) (which include those referred to in paragraph 8(b)) are—

- (a) a bank or wall which supports the hedgerow along at least one half of its length;
- (b) gaps which in aggregate do not exceed 10% of the length of the hedgerow;
- (c) where the length of the hedgerow does not exceed 50 metres, at least one standard tree;

- (d) where the length of the hedgerow exceeds 50 metres but does not exceed 100 metres, at least 2 standard trees;
- (e) where the length of the hedgerow exceeds 100 metres, such number of standard trees (within any part of its length) as would when averaged over its total length amount to at least one for each 50 metres;
- (f) at least 3 woodland species within one metre, in any direction, of the outermost edges of the hedgerow;
- (g) a ditch along at least one half of the length of the hedgerow;
- (h) connections scoring 4 points or more in accordance with sub-paragraph (5);
- (i) a parallel hedge within 15 metres of the hedgerow.

(5) For the purposes of sub-paragraph (4)(h) a connection with another hedgerow scores one point and a connection with a pond or a woodland in which the majority of trees are broad-leaved trees scores 2 points; and a hedgerow is connected with something not only if it meets it but also if it has a point within 10 metres of it and would meet it if the line of the hedgerow continued.

8. The hedgerow—

- (a) is adjacent to a bridleway or footpath, within the meaning of the Highways Act 1980(15), a road used as a public path, within the meaning of section 54 (duty to reclassify roads used as public paths) of the Wildlife and Countryside Act 1981(16), or a byway open to all traffic, within the meaning of Part III of the Wildlife and Countryside Act 1981(17), and
- (b) includes at least 4 woody species, ascertained in accordance with paragraph 7(3) and at least 2 of the features specified in paragraph 7(4)(a) to (g).'

Schedule 3 Woody Species

Alder (*Alnus glutinosa*)
Apple, crab (*Malus sylvestris*)
Ash (*Fraxinus excelsior*)
Aspen (*Populus tremula*)
Beech (*Fagus sylvatica*)
Birch, downy (*Betula pubescens*)
Birch, silver (*Betula pendula*)
Black-poplar (*Populus nigra* sub-species *betulifolia*)
Blackthorn (*Prunus spinosa*)
Box (*Buxus sempervirens*)
Broom (*Cytisus scoparius*)
Buckthorn (*Rhamnus cathartica*)
Buckthorn, alder (*Frangula alnus*)
Butcher's-broom (*Ruscus aculeatus*)
Cherry, bird (*Prunus padus*)
Cherry, wild (*Prunus avium*)

Cotoneaster, wild (*Cotoneaster integerrimus*)
Currant, downy (*Ribes spicatum*)
Currant, mountain (*Ribes alpinum*)
Dogwood (*Cornus sanguinea*)
Elder (*Sambucus nigra*)
Elm (*Ulmus species*)
Gooseberry (*Ribes uva-crispa*)
Gorse (*Ulex europaeus*)
Gorse, dwarf (*Ulex minor*)
Gorse, western (*Ulex gallii*)
Guelder rose (*Viburnum opulus*)
Hawthorn (*Crataegus monogyna*)
Hawthorn, midland (*Crataegus laevigata*)
Hazel (*Corylus avellana*)
Holly (*Ilex aquifolium*)
Hornbeam (*Carpinus betulus*)
Juniper, common (*Juniperus communis*)
Lime, large-leaved (*Tilia platyphyllos*)
Lime, small-leaved (*Tilia cordata*)
Maple, field (*Acer campestre*)
Mezereon (*Daphne mezereum*)
Oak, pedunculate (*Quercus robur*)
Oak, sessile (*Quercus petraea*)
Osier (*Salix viminalis*)
Pear, Plymouth (*Pyrus cordata*)
Pear, wild (*Pyrus pyraster*)
Poplar, grey (*Populus x canescens*)
Poplar, white (*Populus alba*)
Privet, wild (*Ligustrum vulgare*)
Rose (*Rosa species*)
Rowan (*Sorbus aucuparia*)
Sea-buckthorn (*Hippophae rhamnoides*)
Service-tree, wild (*Sorbus torminalis*)
Spindle (*Euonymus europaeus*)

Spurge-laurel (*Daphne laureola*)

Walnut (*Juglans regia*)

Wayfaring-tree (*Viburnum lantana*)

Whitebeam (*Sorbus* species)

Willow (*Salix* species)

Yew (*Taxus baccata*)

8.3 Annex C – Importance of Ecological Features Criteria

Importance of ecological features based on CIEEM guidance (Ref 17)

Importance of ecological features	Typical descriptors and examples of criteria
International or European	<p>An internationally designated site or candidate site including Special Protection Area (SPA), potential SPAs (pSPAs); Special Area of Conservation (SAC), candidate or possible SACs (cSACs or pSACs¹) and Ramsar sites (wetlands of international importance). Biogenetic Reserves, World Heritage Sites and Biosphere Reserves. Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such. Resident or regularly occurring populations of species which may be considered at an international or European level² where:</p> <ul style="list-style-type: none"> • the loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; • the population forms a critical part³ of a wider population at this scale; or • the species is at a critical phase⁴ of its life cycle at this scale.
UK or National	<p>Sites designated at UK or national level e.g. Site of Special Scientific Interest (SSSI), Marine Protection Area (MPA) including Marine Conservation Zones (MCZ) and National Nature Reserve (NNR). Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such. Areas of key or priority habitats identified in the UK Post-2010 Biodiversity Framework i.e. UK Biodiversity Action Plan (BAP), including those published in accordance with Section 41 of the Natural Environment and Rural Communities Act (2006) and those considered to be of principal importance for the conservation of biodiversity. Areas of ancient woodland. Resident or regularly occurring populations of species which may be considered at a UK or a national level⁵ where:</p> <ul style="list-style-type: none"> • the loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; • the population forms a critical part of a wider population at this scale; or • the species is at a critical phase of its life cycle at this scale.
Regional	<p>Habitats or populations of species of value at a regional level (i.e. East Anglia). Areas of key or priority habitat identified as being of Regional value in the appropriate National Character Area (NCA).</p>

Importance of ecological features

Typical descriptors and examples of criteria

	<p>Key or priority habitat or species listed within the Highways England (HE) / Highways Agency (HA) BAP.</p> <p>Resident or regularly occurring populations of species which may be considered at a regional level⁶ where:</p> <ul style="list-style-type: none"> • the loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; • the population forms a critical part of a wider population at this scale; or • the species is at a critical phase of its life cycle at this scale.
<p>County or Unitary Authority or District</p>	<p>Habitats or populations of species of value at a County (i.e. Essex) level or District (e.g. Braintree).</p> <p>Designated sites, such as County Wildlife Site (CWS), Local Wildlife Site (LWS) or Sites of Importance for Nature Conservation (SINC) and Local Nature Reserve (LNR) designated in the county or unitary authority area i.e. District context.</p> <p>Areas which meet the published selection criteria for those sites listed above but which are not themselves designated as such.</p> <p>Areas of key or priority habitats identified in the Local Biodiversity Action Plan (LBAP).</p> <p>Resident or regularly occurring populations of species which may be considered at a County (or District) level⁷ where:</p> <ul style="list-style-type: none"> • the loss of these populations would adversely affect the conservation status or distribution of the species at this geographic scale; • the population forms a critical part of a wider population at this scale; or, • the species is at a critical phase of its life cycle at this scale.
<p>Local</p>	<p>Habitats or species populations of value in a local (i.e. within ~ 5km of the site) context.</p> <p>Designated sites include LNRs designated in the local context.</p> <p>Trees that are protected by Tree Preservation Orders (TPOs).</p> <p>Areas of habitat or populations and, or communities of species considered to appreciably enrich the habitat resource within the local context (such as veteran trees), including features of value for migration, dispersal or genetic exchange.</p>
<p>Order limits</p>	<p>Habitat that is of value in the context of the Order limits only.</p> <p>Populations of common and widespread species.</p> <p>A degraded/ impoverished example of a common or widespread habitat in the local area.</p>

1. pSACs are sites which have been formally advised by to UK Government but have not yet been submitted to the European Commission. These sites should be valued at an international (European) level on the basis that they meet the relevant selection criteria for a SAC but are not yet designated as such.
2. Such species include those listed within the Directive 2009/147/EC on the Conservation of wild birds (i.e. EC Birds Directive) (codified version of Council Directive 79/409/EEC as amended) or animal/ plant species listed within Council Directive 92/43/EEC on the Conservation of natural habitats and of wild flora and fauna (i.e. Habitats Directive).
3. Such populations include sub-populations that are essential to maintenance of metapopulation dynamics e.g. critical emigration/ immigration links between otherwise discrete populations.

4. Seasonal activity or behaviour upon which survival or reproduction depends.
5. Species which may be considered at the UK or national level means; birds, other animals and plants which receive legal protection in the basis of their conservation interest (those listed within the Wildlife and Countryside Act 1981 (as amended) Schedule 1, 5 and 8); species listed for their principal importance for biodiversity (in accordance with the Natural Environment and Communities Act 2006 Section 41 England); priority species listed within the UK Post 2010 Biodiversity Framework (i.e. UKBAP); or species listed within the Red Data Book.
6. Such species include those listed in the appropriate Natural Character Area and key/ priority species listed on the 2002 HABAP
7. Such species include those at county level (i.e. Essex) including unitary authority area i.e. District level (i.e. Braintree); as listed on the LBAPs; and listed as a county designated site.

*As well as assigning importance there is also a need to identify all legally protected species that could be affected by the Scheme in order that measures can be taken to ensure that adherence to the relevant legislation is observed. This may include the adoption of mitigation and appropriate licensing which is acceptable to Natural England.

8.4 Annex D – Survey Results

ARABLE FLORA

Survey Results Forms

Recorder: MP			Project Name: Longfield Solar		
Project Number:			Location 6-fig grid ref: TL758127		
Date: 23 June 2020 and 9 Sept 2020			Site Ref No.: AF1		
Crop type: Oil-seed rape			Notes: Ploughed on 9th Sept visit no arable flora.		
Soil type: Clays, impeded drainage					
Description of site (is it one field boundary or a whole field?; other pertinent info): whole field, other species ragwort, hedge mustard, scentless mayweed, fat-hen, creeping thistle, hemlock, redshank					
Species*	Present (Y)	DAFOR	Score GB	Score Eng*	Pop. count, 8-fig grid ref (taxa score 7+)
Anthemis arvensis	Y	R	8	8	1 plant at TL7585 1230
Lipandra polyspermum	Y	R	2	2	
TOTAL SCORE			10	10	

Recorder: MP			Project Name: Longfield Solar		
Project Number:			Location 6-fig grid ref: TL772116		
Date: 11 July 2020 and 9 Sept 2020			Site Ref No.: AF2		
Crop type: Potatoes			Notes:		
Soil type: Sandy/loams free draining					
Description of site (is it one field boundary or a whole field?; other pertinent info): North and east boundaries only. Other species annual nettle, scentless mayweed, fat-hen					
Species*	Present (Y)	DAFOR	Score GB	Score Eng*	Pop. count, 8-fig grid ref (taxa score 7+)
Chenopodium ficifolium	Y	O	2	2	
Kickxia spuria	Y	R	3	3	
Lipandra polyspermum	Y	F	2	2	
TOTAL SCORE			7	7	

Recorder: MP			Project Name: Longfield Solar		
Project Number:			Location 6-fig grid ref: TL752156		
Date: 23 June 2020 and 9 Sept 2020			Site Ref No.: AF3		
Crop type: Potatoes			Notes: No important species in June, only Sept		
Soil type: Sandy/loams free draining					
Description of site (is it one field boundary or a whole field?; other pertinent info): Whole field					
Species*	Present (Y)	DAFOR	Score GB	Score Eng*	Pop. count, 8-fig grid ref (taxa score 7+)
Chenopodium ficifolium	Y	R	2	2	
Kickxia elatine	Y	O	2	2	
Kickxia spuria	Y	O	3	3	
TOTAL SCORE			7	7	

HEDGEROWS

Ecological features of the hedgerows surveyed, and confirmation of whether they are species-rich or important under paragraphs 6 & 7 of the Hedgerow Regulations

Hedge No.	Hedge Length (m)	>30 years old?	Mean number of qualifying woody species	*Sig number of trees (no. of trees in hedgerow)?	*3 woodland herbs within 1m of hedge margins?	*Gaps <10% of hedge?	*Bank or wall along at least half of the hedge?	*Ditch along at least half of the hedge?	*Connections scoring 4 points or more (points scored)?	*Parallel hedge within 15m?	Protected species (as defined by the Regs)?	Public Right of Way running Parallel?	Important Hedgerow?	Species-rich?
H1	196	✓	6.5	N (1)	No	Yes	No	No	Yes (4)	No	No	Yes	Yes	Yes
H2	52	✓	6	Y (2)	No	Yes	No	No	No (1)	No	No	No	No	Yes
H3	420	✓	7	Y (15)	No	Yes	No	Yes	Yes (6)	No	No	No	Yes	Yes
H4	280	✓	5.33	Y (10)	Yes, dog's mercury, wood false-brome, lord's-and-ladies	Yes	No	Yes	Yes (4)	No	No	No	Yes	Yes
H5	204	✓	4.5	Y (6)	No	Yes	No	Yes	No (3)	No	No	Yes	Yes	No
H6	195	✓	5.5	Y (5)	No	Yes	No	Yes	No (3)	No	No	No	No	Yes

Hedgerow Photos (June/July 2020)



H1



H2



H3



H4



H5



H6

Other Flora Survey Photos



Round-leaved Fluellin at AF2



Set-aside and arable field margin at AF3



Grassland set-aside at G3



Scented Chamomile



Verges along Ridley Hall Road G2



Track and verges south of Ridley Hall Road G1



Set-aside grassland at G4



Grass verge and ditch at G5



Grassland set-aside at G6



Grass bank at G6 (also Hedge H3)



Wild Onion at G6



Corn Chamomile at AF1

