

PLANNING APPLICATION FOR A PHOTOVOLTAIC SOLAR FARM AND ASSOCIATED INFRASTRUCTURE

**LAND TO THE WEST OF ERLAS LANE, ERLAS HALL
FARM, WREXHAM**

ARBORICULTURAL SURVEY, IMPACT ASSESSMENT AND PROTECTION PLAN

ON BEHALF OF LIGHTSOURCE RENEWABLE ENERGY LIMITED

***BS5837:2012 'TREES IN RELATION TO DESIGN, DEMOLITION AND
CONSTRUCTION – RECOMMENDATIONS'***

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Date	Rev	Description	Initials
18.09.15	A	First issue	MGP

1. INTRODUCTION

- 1.1 Pegasus Group were instructed by Lightsource Renewable Energy Limited to carry out a tree survey on land to the west of Erilas Lane, Erilas Hall Farm, Wrexham, herein referred to as the "site".
- 1.2 The scope of the assessment was to visit the site and to survey relevant trees, hedges and shrub masses in accordance with BS5837:2012 '*Trees in relation to design, demolition and construction – recommendations.*' Pegasus Group was requested to then present the following information:
- Tree survey report;
 - Schedule of tree survey data; and
 - Tree survey and constraints plan.
- 1.3 With reference to the above information and BS 5837:2012, Pegasus Group was subsequently also instructed to assess the impact of development proposals on the site's arboricultural resource and to produce the following:
- Arboricultural Impact Assessment;
 - Tree Protection Plan; and
 - Heads of terms for an Arboricultural Method Statement.

2. REPORT LIMITATIONS

- 2.1 Trees are living organisms as well as self-supporting dynamic structures. Their physiological and structural condition can change rapidly in response to a wide range of biotic/abiotic factors. They have the potential to fail structurally, without prior manifestation of any reasonably observable symptoms. It is therefore not possible to categorically state that any tree is 'safe'.
- 2.2 Any management recommendations set out within this report are of a preliminary nature only and relate to trees within the context of current site use. Similarly, quality assessments of surveyed trees are relevant to the time and date of the site visit and reflect conditions encountered.
- 2.3 All surveyed trees were assessed from ground level only. No detailed investigations (climbing, boring, core sampling, ultrasound etc.) were carried out.
- 2.4 In order for tree owners to reasonably comply with Duty of Care responsibilities, it is advised that an additional programme of tree risk management is implemented. This professional tree inspection process should contain a brief to evaluate the degree of risk posed by trees on the site and to specify, as well as prioritise, appropriate risk control measures as may be necessary.
- 2.5 This report is prepared for the planning application purposes only and does not evaluate the degree of risk posed by trees.
- 2.6 It is beyond the scope of this report to comment in relation to structural damage – direct or indirect, existing or potential – that might be associated with vegetation growth, or vegetation-related soil subsidence or heave.
- 2.7 Any physical alterations to site conditions subsequent to the date of the site survey will have the potential to change/invalidate the findings and recommendations of this report.
- 2.8 The findings and recommendations of this report are limited to a period of 24 months from the date of this report.

3. DOCUMENTS AND INFORMATION PROVIDED

3.1 For the purposes of carrying out the assessment, Pegasus Group were provided with the following information:

- DM & S, Digital Surface Model, drawing TS0287/066/DSM/01, June 2015.
- Lightsource Renewable Energy, Proposed Layout Rev5, drawing EHF_01_Rev05, 18.08.15.

4. OTHER CONSIDERATIONS

Statutory tree protection

- 4.1 Wrexham Council has confirmed (via email 15th September 2015) that the site is not located within a Conservation Area and that none of the trees within nor adjacent to it are protected by a Tree Preservation Order (TPO). The following sections (4.2-4.4) are included for information only.
- 4.2 Excluding specific exemptions (including the granting of full planning permission) it is an offence to carry out any works to any tree that is subject to a TPO without having first applied for and obtained the approval of the local planning authority.
- 4.3 On many non-residential sites (excluding specific exemptions) there is also a statutory restriction relating to tree felling that relates to quantities of timber that can be removed within set time periods. In basic terms, it is an offence to remove more than 5 cubic metres of timber in any one calendar quarter without having first obtained a felling licence from the Forestry Commission.
- 4.4 Any proposed tree works that are planned to be carried out on site must be carried out with a view to and in accordance with the statutory controls outlined above.

Statutory Wildlife Protection

- 4.5 Although preliminary visual checks from ground level of likely wildlife habitats are made at the time of surveying, detailed ecological assessments of wildlife habitats are not made by the arboriculturist and fall outside the remit of this report.
- 4.6 Trees which contain holes, splits, cracks and cavities could potentially provide a habitat for bats in addition to birds and small mammals. It is recommended that in line with any accompanying specialist advice, any tree works should only be carried out following a detailed climbing inspection to the tree to ensure that protected species or their nests/roosts are not disturbed. If any are found, the project manager, site owner or consulting arboriculturist should be informed and appropriate action taken as recommended by a Statutory Nature Conservation organisation such as Natural England.
- 4.7 It is advised that tree/hedgerow works are carried out with the understanding that birds will generally nest in trees, hedges and shrubs between March and

August. Ideally, operations should be avoided during this period. Any necessary work should only be carried out following a preliminary check of the vegetation.

- 4.8 For information, the Wildlife and Countryside Act 1981 (as amended), The Countryside and Rights of Way Act 2000 (as amended) and the Conservation of Habitat and Species Regulations 2010, form the basis of the statutory legislation for flora and fauna in Britain.

5. SURVEY METHODOLOGY

Site visit

- 5.1 Pegasus Group visited the site on the 14th September 2015. Individual present on site. Michael Paginton TechArborA.

Tree Survey

- 5.2 The tree survey was carried out with reference to methodology set out in BS5837:2012 '*Trees in relation to design, demolition and construction – Recommendations*'. Trees were not tagged.
- 5.3 Trees were surveyed individually or as groups where it was considered that they had grown together to form cohesive arboricultural features either aerodynamically (trees that provide companion shelter), visually (e.g. avenues or screens) or culturally (including for biodiversity). However, where it was considered that there was an arboricultural need to differentiate between attributes trees within groups were also surveyed as individuals
- 5.4 Tree survey findings are recorded in the tree survey schedule (Appendix 2).
- 5.5 Within the tree survey schedule, each surveyed tree (T), hedgerow (H), woodland (W) and group (G), on or adjacent to the cable route is given a *reference number* which refers to its position on the tree survey plan (Appendix 3).
- 5.6 Also shown on the tree survey plan are quality grading and preliminary tree constraints: root protection areas (see paragraph 8.2 for definition).
- 5.7 *Tree species* are listed by common name.
- 5.8 *Heights* are measured in metres. They are recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m.
- 5.9 *Trunk diameters* are measured in millimetres and are rounded to the nearest 10mm. Single stemmed tree diameters are measured at 1.5m above ground level or, where a fork or swelling makes this impractical, at the narrowest point beneath. Diameters of multi-stemmed trees are calculated as '*combined stem diameters*' according to specific guidance set out within BS5837:2012.
- 5.10 *Branch spreads* are taken at the four cardinal points to derive an accurate representation of the tree crown. They are recorded up to the nearest half metre

- for dimensions up to 10m and to up the nearest whole metre for dimensions over 10m.
- 5.11 *Crown clearance* is expressed both as existing height above ground level of first significant branch along with its direction of growth (e.g. 2.5m-N), and also in terms of the overall canopy. Measurements are recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m.
- 5.12 *Estimates*. Where any other measurement has had to be estimated, due to inaccessibility for example, this is indicated by a “#” suffix to the measurement as shown in the tree survey schedule.
- 5.13 *Life stage* is defined as Y – young (stake dependent), SM - Semi-Mature (still capable of being transplanted without preparation, up to 30cm girth and not yet sexually mature), EM – Early Mature (not yet having reached 75% of expected mature size), M – Mature (anything else up to normal life expectancy for the species), OM – Over Mature (anything beyond mature and in natural decline), V – Veteran (any tree displaying characteristics described by Natural England).
- 5.14 *General observations* are recorded in relation to a tree’s structural and/or physiological condition (e.g. the presence of any decay and physical defect) and /or any preliminary management recommendations that may be appropriate.
- 5.15 *Physiological condition* is described as *Good* (no indications of impaired physiological function and in optimum condition for age and species), *Fair* (with indicators of reduced vitality. Some intervention may be required), *Poor* (with significantly impaired physiological function for age and species).
- 5.16 *Structural condition* is described as *Good* (without any observable significant biomechanical structural weaknesses), *Fair* (with minor biomechanical structural flaws. Some remedial action may be required), *Poor* (with significant biomechanical weaknesses requiring intervention particularly where risk management is required).
- 5.17 *Useful life expectancy*, or the length of time a tree’s is estimated to be able to make a useful contribution, is expressed in years as: <10, 10+, 20+, 40+.

5.18 *Quality* of individual trees, groups of trees and woodlands is assessed in terms of quality and benefit within the context of proposed development and graded into one of four categories (A, B, C and U) which are differentiated on the tree survey (Appendix 3) plan by the colours indicated below:

Category A (Green)	Trees of high quality with an estimated remaining life expectancy of 40 years
Category B (Blue)	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
Category C (Grey)	Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.
Category U (Red)	Unsuitable for retention. Trees in such a poor condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

5.19 A, B and C trees have also been given a sub-category of 1, 2 or 3 which reflects their arboricultural, landscape or cultural and conservation values respectively. Each subcategory has an equal weight, for example an A1 tree has the same retention priority as an A3 tree.

5.20 In addition to the category, the tree survey schedule also describes each tree's root protection area (RPA) in terms of radius (metres) and overall area (sq metres).

6. DESCRIPTION OF SITE AND TREES

6.1 The site is located to the east of Wrexham, on land at ErLas Hall Farm located between Wrexham and Wrexham Industrial estate. A Site Location Plan is at Appendix 1.

- Post code: LL13 9UD
- Grid reference: SJ3667250429

6.2 The site extends over three individual fields, two of which are currently used for cattle and sheep grazing with the third utilised for arable production. Each of the fields varies in terms of size and shape, with land broadly descending from the north and south towards the site.

6.3 The site is bounded on all sides by further arable and pastoral farmland with boundary vegetation comprised of hedgerows with mature trees or woodland groups. The trees and vegetation on site are confined to the field boundaries, with the internal areas of each field being open.

6.4 A small woodland group is located to the north western corner of the site with a second, Redwither Wood, located outside the north eastern boundary. Redwither Wood is comprised of Ancient Semi Natural Woodland.

6.5 Trees and vegetation on site are largely comprised of native and naturalised species such as oak, ash, hazel, sycamore, alder, willow, hawthorn, blackthorn and elder.

6.6 Access to the site is gained from passage across farmland utilising field gateways from either Llwyn Knottia Farm to the west of the site or from ErLas Lane to the east of the site.

7. TREE SURVEY FINDINGS

7.1 A total of sixty four survey items (trees, groups, woodland and hedgerows) were considered to be relevant to the current application site. (See Appendix 2 and 3).

7.2 A summary of tree survey findings are shown in table form below:

	Total	A	B	C	U
Tree	32	2	22	8	0
Groups	18	0	6	11	1
Woodland	2	0	2	0	0
Hedgerows	12	0	6	6	0
Total	64	2	36	25	1

7.3 A total of thirty six surveyed items were considered to be of moderate quality (Category B), with in the region of at least 20 years life expectancy. A further twenty five surveyed items were considered to be of low quality (Category C) which were typically of very limited merit or exhibiting an impaired condition with an estimated life expectancy of at least 10 years.

7.4 One surveyed item was assessed to be in such a poor physiological and structural condition that it was considered unsuitable for retention in its current site context (Category U).

7.5 Two surveyed items were assessed as being in such good physiological and structural condition that they were considered to be of high quality (Category A).

7.6 Selected photographs of the site are shown below:



Photoview 1: View looking west towards the G8, W9 (Cat B) and G53 (Cat C) located to the south-west of the site.



Photoview 2: View looking west along H13 (Cat B) towards T15 (Cat B).



Photoview 3: View looking southeast towards H25 (Cat C), G23 (Cat B) and T24 (Cat C). The proposed maintenance access is to run through H25 to the north of G23 (left of frame).



Photoview 4: View looking north towards T39 (Cat A), T40 (Cat B), and T41 (Cat C).



Photoview 5: View looking west towards G44 (Cat C), T46 (Cat B), T47 (Cat C), T48 (Cat B), and T49 (Cat B).



Photoview 6: View looking south with T52 (Cat B) within the centre of the frame.

8. IDENTIFICATION OF PRELIMINARY TREE CONSTRAINTS

- 8.1 In accordance with BS5837:2012, below ground constraints, or root protection areas (RPAs), for the surveyed trees have been plotted onto the tree survey plan for the site. These are represented as a circle centred on the base of each tree stem with a radius of 12 times stem diameter measured at 1.5m above ground level.
- 8.2 With reference to BS5837:2012, a root protection area (RPA) is defined as “a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree’s viability, and where the protection of the roots and soil structure should be treated as a priority”. “The default position [when considering design layout in relation to RPAs] should be that structures are located outside the RPAs of trees to be retained”.
- 8.3 BS5837:2012 states (4.6.2) that, “where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced.” The BS goes on to state that, “modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution,” and that any deviation from the original circular plot should take into account:
- morphology and disposition of roots;
 - topography and drainage;
 - soil type and structure;
 - the likely tolerance of the tree to root damage/disturbance.
- 8.4 Root systems can be damaged in a number of ways as follows:
- Severance of a root will destroy all parts of the root beyond that point. The larger the root severed, the greater the impact on the tree. If roots are damaged close to the trunk, the anchorage and stability of the tree can be affected.
 - The root bark protects the root from decay and is also essential for further root growth. If damage to the bark extends around the whole circumference, the root beyond that point will be killed.

- Soil compaction, which may occur from storage of material or passage of heavy equipment over the root area, can restrict and even prevent gaseous diffusion through the soil, and thereby asphyxiate the roots. The roots must have oxygen for survival, growth and effective functioning.
- Lowering the soil level will strip out the mass of roots near the surface.
- Raising soil levels will have the same effect as soil compaction.
- Incorrect selection and application of herbicide.
- Spillage of oils or other harmful materials.

8.5 Above ground constraints posed by trees describe the capacity for trees to have an overbearing or dominating effect on new developments. Typical above ground constraints include a number or combination of inconveniences including shading, branch spread, movement of trees during strong winds and so on. If not adequately considered, above ground constraints can lead to repeated requests to fell or heavily prune retained and protected trees.

8.6 The colour-coded categorisation of tree quality is also shown on the tree survey plan.

9. DESCRIPTION OF PROPOSED DEVELOPMENT

- 9.1 The proposed development consists primarily of the installation of solar photovoltaic panels supported on steel framework laid out in rows (strings) across the site with supporting infrastructure.
- 9.2 The supporting infrastructure comprises:
- Inverter stations;
 - A DNO substation
 - Communications building;
 - A temporary construction compound;
 - Perimeter security fencing; and
 - Access roads.
- 9.3 It is proposed that construction access will be via a new track which connects the site to the existing agricultural lane off Cefn Road to the west of the site. Access for the duration of the operation of the solar farm for maintenance will be accessed via Erlas Lane requiring the construction of a permanent access road to enter to the north east corner of the site.

10. ARBORICULTURAL IMPACT ASSESSMENT (AIA)

10.1 With reference to BS5837:2012 '*Trees in relation to design, demolition and construction*', this AIA evaluates the direct and indirect effects of the proposed design on the site's arboricultural resource.

10.2 The AIA considers the effects of any tree loss required to implement the design as well as any potentially damaging activities proposed in the vicinity of retained trees. BS5837:2012 suggests that such activities might include:

- Removal of existing structures and hard surfacing;
- Installation of new hard surfacing;
- Installation of services;
- Location and dimensions of all proposed excavations and changes in ground level (including those that might arise from the implementation of recommended mitigation measures);
- The 'buildability' of the scheme in terms of access, adequate working space, provision for storage of materials including topsoil.

10.3 With reference to BS5837:2012, the AIA includes the following information:

- an evaluation of the impact of proposals (Appendix 4 and 10.5-10.25 below)
- Tree Retention/Removal and Protection Plan (Appendix 5).

10.4 An AIA schedule is included at Appendix 4. This provides a tree-by-tree assessment of the potential impacts of the proposals. It also evaluates the degree of impact and sets out mitigation measures as may be necessary. This overall assessment is expanded on below:

Evaluation of effects of proposed losses

- 10.5 The table and comments below summarise the tree retention and loss across the site.

TREES/ GROUPS/ HEDGEROWS /WOODLAND	Total	Number loss	Number retained
Category A	2	0	2
Category B	37	0	37
Category C	24	0	24
Total	63	0	63

- 10.6 The table indicates that proposals have the potential to retain all surveyed items. However, proposals will require the removal of small section of G1, H16, H30, and H63 to facilitate site access construction and security fencing installation. It is considered that these removals would be minor in comparison to the overall arboricultural resource on site.
- 10.7 Please note that the above table does not include Category U items. Only one survey item (G58) was assessed to be in such as poor physiological condition that it is considered unsuitable for retention within its current site context. However, G58 is located on the southern boundary of the site and would not require removal as part of proposals.

Tree works

- 10.8 In order to facilitate construction vehicle access into the site it is anticipated that minor facilitation pruning would be required in relation to T15, T42, and T62 to ensure clearance between canopies and vehicles.
- 10.9 Minor facilitation pruning may also be required to the outer canopies of T14, T15, T39 and T40 to ensure clearance between the site security fencing.

10.10 It is considered that any pruning works, to be undertaken in accordance with BS3998:2010 by a suitably qualified and competent contractor, would be minimal and acceptable from an arboricultural perspective.

10.11 Other than the identified minor facilitation pruning for access and security fence installation there are no significant tree works required in order to implement proposals.

Installation of site security fencing

10.12 The location of the site security fencing has been designed to avoid impacts on boundary vegetation. As such, encroachment into RPAs is largely avoided. However, security fence installation will encroach into the outer RPAs of T11, T14, T15, T18, T19, T21, T39, T40, T49 and T52. Due to the limited extent of encroachment, current vitality of each of the trees and the nature of security fence installation (pile driven), it is considered that this would not have an adverse impact on the retained tree and is acceptable from an arboricultural perspective.

Installation of solar panels

10.13 The alignment of solar panels largely avoids retained vegetation. However, the alignment does encroach slightly into the outer eastern part of the RPA of T18 and western edge of T48. Given the limited extent of encroachment, the nature of construction (pile driven on steel framework) and the current vigour of T18 and T48, it is considered that this would not cause any significant effect.

Removal of existing structures and hard surfacing

10.14 No existing structures and hard surfacing in proximity to retained trees will need to be removed to enable the proposed development.

Installation of hard surfacing

10.15 There are two proposed access routes into the site, one for DNO and maintenance purposes and a second for construction vehicles. Access to the site for maintenance purposes will be off Erlas Lane to the east of the site and will involve the installation of a permanent compacted gravel road. The route of the access will utilise an existing farm gate off Erlas Lane to run across a pastoral field, along the line of boundary vegetation to enter the site to the south of W22. There is sufficient space within the field to enable the maintenance access road to be

constructed without impacting on retained vegetation. It is advised that new access construction should be located to avoid identified tree constraints including RPAs.

10.16 The access for construction vehicles will enter the site from the south west corner. This access partly utilises an existing tarmac farm track (which runs from Cefn Road to Llwyn Knottia Farm) and will require the construction of a temporary access road within an arable field and will run along existing boundary vegetation from the farm to enter the site through an existing gap between G8 and G53. It is considered that there is sufficient space within the arable field to enable the construction of a temporary construction vehicle access without leading to impacts on retained vegetation. Access road construction should respond to identified tree constraints and avoid encroachment into RPAs or canopy lines.

10.17 As part of proposals an internal access road will be constructed within the site. The alignment of the internal access track largely avoids retained vegetation. However, it does encroach into the outer RPAs of T15, G23, T39, T40 and T42. In these locations it is recommended that the internal access road should be constructed using a "no-dig" methodology such as a suitable above ground load bearing cellular confinement system. This should be detailed within and carried out in line with an Arboricultural Method Statement.

Installation of cables within the site

10.18 All surveyed items are confined to the boundaries of the site. A preliminary evaluation of the layout demonstrates that adequate space exists within the site's internal layout for cable routes to be installed without impact on retained trees.

10.19 Notwithstanding the above, in the event of excavations being required within the RPA of any retained tree, works can be carried out in accordance with specifications and recommendations defined by the National Joint Utilities Group in the guidance document NJUG Volume 4 – Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees. Additional guidance should also be provided by an arboriculturist.

Excavations

10.20 No major groundworks are required within the RPA of any retained items on site.

Shading

- 10.21 The proposed solar PV panel strings would be installed in an east-west orientation with south-facing panels to maximise opportunity for panels to receive irradiation. The solar PV panel arrays would be laid out within the existing boundary to retain the field pattern and ensure that the development is well contained both physically and visually. The PV panel arrays have been located so as to avoid any shading from existing vegetation that is to be retained as part of the proposals. Therefore, pressure to prune or remove post development should be avoided.

Levels

- 10.22 No levels details have been received, however, due to the nature of the proposals no level changes within RPAs of retained trees are anticipated.
- 10.23 Should any alterations to the ground levels within RPA's be required, the proposed work will need to be fully assessed by an arboriculturist to identify any impacts to retained trees. Then if appropriate, the work will need to be undertaken in accordance with a detailed arboricultural method statement.

'Buildability'

- 10.24 It is proposed that the site compound to accommodate site huts, storage of materials and contractors parking, will be located outside of the site to the south of G53 and away from retained vegetation.
- 10.25 Provided that tree protection measures outlined in this report are put in place, it is considered that there is adequate space to enable the proposals to be constructed without significant impacts to retained trees.

11. TREE PROTECTION PLAN (TPP)

11.1 The Tree Protection measures are shown on the attached Tree Retention/Removal and Protection Plan at Appendix 5.

11.2 In accordance with BS5837:2012 the TPP is superimposed onto the proposed site layout plan and based on the topographical survey. Any hard surfacing and structures within the RPAs of trees to be retained are shown on the Tree Retention/Removal and Protection Plan. In addition, where relevant, the TPP shows the following information, accompanied by descriptive text as required:

- Precise locations of protective barriers (forming Construction Exclusion Zones in relation to RPAs of retained trees)
- Extent and type of any ground protection;
- Other protection measures necessary e.g. tree protection boxes.

11.3 The preparation of the TPP has considered the following factors where relevant:-

- Site construction access;
- intensity and nature of construction activity;
- contractors car parking;
- phasing of construction works;
- availability of special construction techniques;
- spatial requirements for:
 - temporary and permanent apparatus and service runs;
 - foundation excavations and construction works;
 - cranes, plant scaffolding and access during works;
 - site huts, toilets (including drainage) and other temporary structures;
 - storage (either temporary or long-term) of materials, spoil, fuel and mixing of concrete.

- All changes in ground levels including location of retaining walls, steps and adequate allowance for foundations of such walls and backfillings.
- 11.4 The tree protection measures shown on the Retention/Removal and Protection Plan demonstrate the feasibility of the proposed development in relation to retained trees.
- 11.5 There are two types of tree protection fencing to be installed on site which will comprise site security fencing and temporary tree protection fencing (in line with BS.5837: 2012).
- 11.6 Site security fencing to be used around the perimeter of the solar farm is to consist of 2m high deer fencing. This fencing will remain in place for the life of the solar farm. This fencing is considered suitable to provide tree protection in line with the recommendations as set out within BS:5837:2012, provided it is erected prior to any construction taking place on site. This would offer protection for the majority of surveyed items around the perimeter of the site from the main areas of construction activities. This could be achieved by a suitably worded planning condition.
- 11.7 For surveyed items that would not be protected by the sites security fence temporary tree protection barriers to BS.5837: 2012 should be installed in locations shown on the Retention/Removal and Protection Plan. Temporary tree protection barriers should remain in place for the duration of the main construction phase.
- 11.8 It is also recommended that where the internal access road encroaches into the outer RPAs of T15, G23, T39, T40 and T42, construction should utilise a suitable above ground load bearing cellular confinement system as set out within an Arboricultural method Statement.

12. HEADS OF TERMS FOR AN ARBORICULTURAL METHOD STATEMENT

12.1 BS5837:2012 (Figure 1) recommends that detailed/technical design of tree protection and arboricultural methodologies should be resolved and finalised following on from the approval of the feasibility of a scheme by the relevant regulatory body.

12.2 Annex B and Table B.1 of BS5837:2012, an informative, advises that arboricultural method statement heads of terms are a sufficient level of information in order to deliver tree-related information into the planning system. The table also advises that a detailed arboricultural method statement might reasonably be required as a 'reserved matter' or planning condition.

12.3 In relation to the above site, it is anticipated that arboricultural working methods are likely to be quite straightforward. A draft, 'heads of terms' is set out below:

- Pre commencement site meeting and schedule of site monitoring;
- Hedgerow and group section removals and facilitation pruning where necessary;
- Erection of site security fencing and temporary tree protection barriers
- Installation of access roads including cellular confinement system;
- Main construction phase;
- Removal of temporary tree protection fencing; and
- Final landscaping.

13. SUMMARY

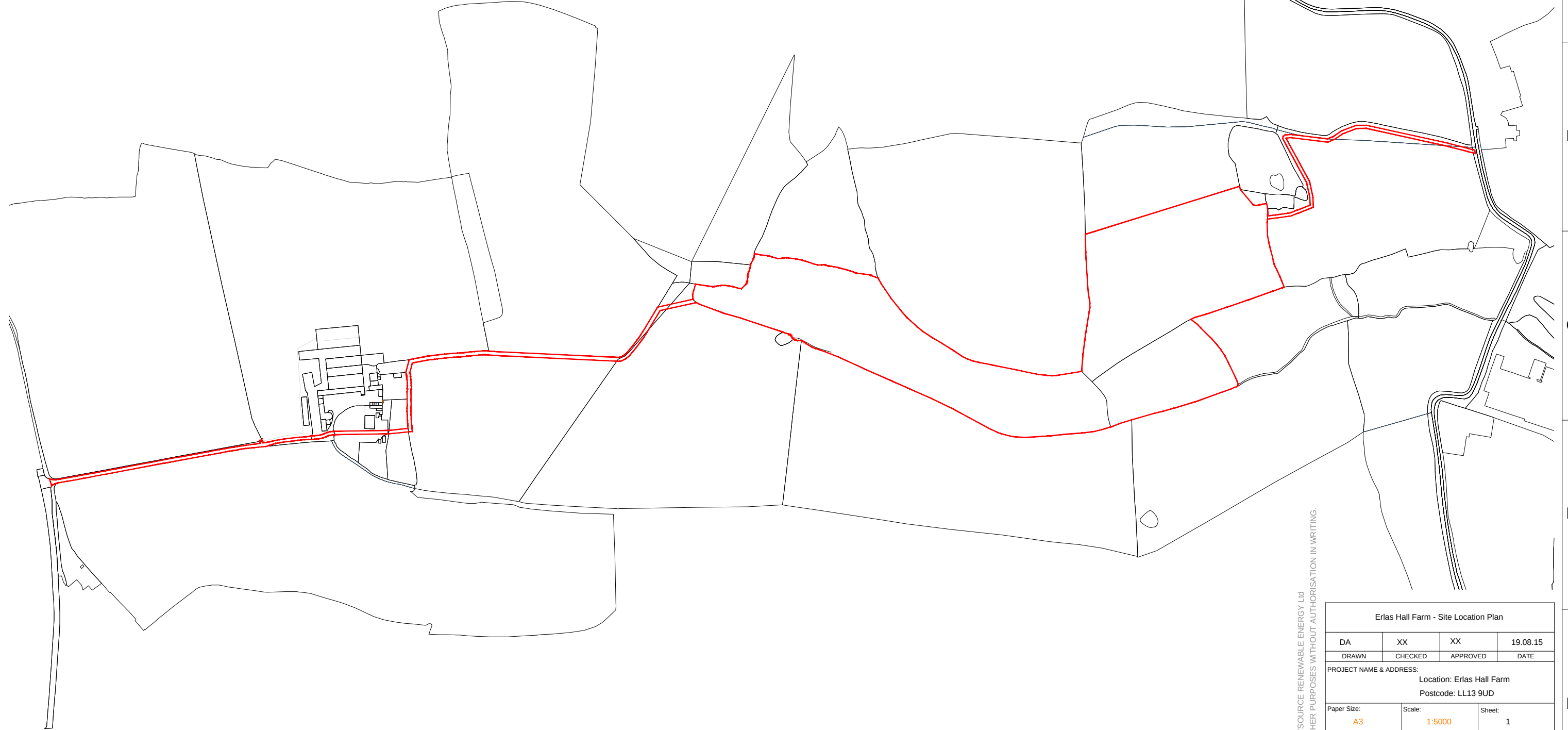
- 13.1 The site is located to the east of Wrexham, on land at ErLas Hall Farm to the west of ErLas Lane.
- 13.2 The site extends over three individual fields, two of which are currently used for cattle and sheep grazing with the third utilised for arable production. Each of the fields varies in terms of size and shape, with land broadly descending from the north and south towards the site.
- 13.3 The site is bounded on all sides by further arable and pastoral farmland with boundary vegetation comprised of hedgerows with mature trees or woodland groups. The trees and vegetation on site are confined to the field boundaries, with the internal areas of each field being open.
- 13.4 A total of thirty six surveyed items were considered to be of moderate quality (Category B), within the region of at least 20 years life expectancy. A further twenty five surveyed items were considered to be of low quality (Category C) typically of very limited merit or exhibiting an impaired condition with an estimated life expectancy of at least 10 years.
- 13.5 One surveyed items were assessed to be in such a poor physiological or structural condition that it was considered unsuitable for retention in its current site context (Category U). Two surveyed items were assessed as being in such good physiological and structural condition that they were considered to be of high quality (Category A).
- 13.6 Proposals have been designed in order retain and protect the trees on and adjacent the site. Through a considered design approach all of the surveyed can be retained. Only small sections of G1, H25, H16 and H63 would require removals in order to facilitate site access and security fencing installation. This is considered minor in terms of the overall arboricultural resource on site.
- 13.7 The majority of the retained trees within the site will not require the default tree protection specification as described within the BS5837:2012 as much of the tree protection on site will rely on the proposed site security fencing. However, temporary barriers to the standards set out in BS5837:2012 would be required in locations shown on the Tree Retention/Removal and Protection Plan (Appendix 5).

- 13.8 The internal access road encroaches into the outer RPAs of T15, G23, T39, T40 and T42. Internal road construction within the RPAs of these trees should utilise a no dig methodology using a suitable above ground load distributing cellular confinement system.
- 13.9 Provided the tree protection measures set out within this report are followed, it is reasonable to conclude that the proposals are acceptable from an arboricultural perspective with overall impact significance of the development being considered minor/insignificant.

APPENDIX 1

SITE LOCATION PLAN

Erlas Hall Farm_Site Location Plan



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Erlas Hall Farm - Site Location Plan			
DA	XX	XX	19.08.15
DRAWN	CHECKED	APPROVED	DATE
PROJECT NAME & ADDRESS: Location: Erlas Hall Farm Postcode: LL13 9UD			
Paper Size: A3	Scale: 1:5000	Sheet: 1	
DRAWING NUMBER: EHF_02		STATUS: Preliminary	
 LIGHTSOURCE SWITCHING ON SUNLIGHT			
Lightsource Renewable Energy Limited, 7th Floor, 33 Holborn, London, EC1N 2HT General: +44 (0) 333 200 0755 Web: www.lightsource-re.co.uk info@lightsource-re.co.uk			

A3 - (420 x 297)mm

APPENDIX 2

TREE SURVEY SCHEDULE

Date: 14.08.15		Site: Erlas Hall Farm												Surveyor: MGP			Client: Lightsource Renewable Energy Limited					Job no: L.0360					
Ref	Species	Height	Est	Stem dia	Est	Spread								Crown clearance height					Life stage	General observations Physiological and structural condition. Preliminary management recommendations	Structural Condition	Physiological Condition	ULE	Quality grading	RPA radius	RPA area	
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy	Est									
G1	Elder, bramble, hawthorn, hazel	3	-	100	-	As on plan								N/A	-	N/A	N/A	-	EM	Low quality, dense nettle and bramble encroachment,,	Poor	Fair	<10	C2	1.2	5	
G2	Holly, elder	7	-	200	-	As on plan								N/A	-	N/A	N/A	-	EM	Dense holly and bramble mass, unmanaged,	Fair	Fair	10+	C2	2.4	18	
T3	Hawthorn	3.5	-	150	-	2	-	2	-	2	-	2	-	N/A	-	N/A	N/A	-	EM	Dense hawthorn bush, adjacent farm shed.	Fair	Fair	10+	C1	1.8	10	
T4	Sycamore	7	-	110	-	2	-	2	-	2	-	2	-	N/A	-	N/A	N/A	-	EM	Adjacent farm building, low quality.	Fair	Fair	10+	C1	1.3	5	
H5	Hawthorn, elder, blackthorn	6	-	100	-	As on plan								N/A	-	N/A	N/A	-	M	Low quality hedgerow between 3-6m, managed south east side in line with access track.	Fair	Fair	10+	B2	1.2	5	
T6	Sycamore	7	-	220	-	4	-	3	-	3	-	3	-	N/A	-	N/A	4	-	M	Set back from farm track by 4m. Unable to see base, reasonably dense canopy.	Fair	Fair	20+	B1	2.6	22	
G7	Sycamore, ash, hawthorn, holly, elm, cherry,	20	-	400	-	As on plan								N/A	-	N/A	N/A	-	M	Mixed group, 5 sycamore to 600mm with other early mature to mature trees to 400mm. Group on slightly raised ground, plough lines within 3-4m of stems, dense group, unable to access.	Fair	Good	20+	B2	4.8	72	
G8	Hazel, hawthorn,	4	-	150	-	As on plan								N/A	-	N/A	N/A	-	M	three re bushes in total, low quality, post and wire fence at base	Fair	Fair	10+	C2	1.8	10	
W9	Hornbeam, spruce, beech, holly, oak, sycamore, willow, ash, poplar	17	-	600	-	As on plan								N/A	-	N/A	1	-	M	Mixed species woodland, large mature oak and sycamore on boundary with site, individual RPAs plotted. Woodland is dense with evidence of felling and pruning within. More recently plantation set behind mature trees on boundary. Woodland edge has low canopies that overhang by up to 10m in places	Fair	Fair	20+	B2	7.2	163	
G10	Alder	12	-	550	#	As on plan								N/A	-	N/A	1.5	-	M	Group of alder on slightly raised ground, cattle trampling at base, low canopy, dense canopies, some past branch loss.	Fair	Fair	20+	B2	6.6	137	
T11	Oak	14	-	900	-	7	-	8	-	7	-	5	-	N/A	-	N/A	2	-	M	Set on slightly raised bank, evidence of past failures, thinning canopy, typical of species	Fair	Fair	20+	B1	10.8	366	
G12	Hawthorn, holly,	5	-	200	#	As on plan								N/A	-	N/A	0.5	-	M	Dense group, some trampling at base.	Fair	Fair	20+	C2	2.4	18	
H13	Blackthorn, hawthorn, hazel	4	-	110	-	As on plan								N/A	-	N/A	0	-	M	dense, intact, managed on flanks,	Fair	Fair	20+	B2	1.3	5	
T14	Oak	13	-	750	#	8	-	8	-	7	-	7	-	N/A	-	N/A	2	-	M	Evidence of past failures, moderate deadwood, reasonably dense canopy,	Fair	Fair	20+	B1	9.0	255	
T15	Oak	10.5	-	650	#	6	-	8	-	8	-	7	-	N/A	-	N/A	2	-	M	Moderate deadwood, evidence of past failures, crack and hollowing stem obscured by vegetation on north west side. Reasonably dense canopy.	Fair	Fair	20+	B1	7.8	191	
H16	Hawthorn, blackthorn, elder, hazel	2	-	100	-	As on plan								N/A	-	N/A	N/A	-	M	Dense, intact, managed	Fair	Fair	20+	B2	1.2	5	
H17	Hawthorn, blackthorn, elder, holly, sycamore	2	-	100	-	As on plan								N/A	-	N/A	N/A	-	M	Dense, managed, intact.	Fair	Fair	20+	B2	1.2	5	
T18	Oak	13	-	900	-	6	-	10	-	6	-	6	-	N/A	-	N/A	2	-	M	Leans to south, evidence of past failures, moderate deadwood, dense canopy	Fair	Fair	20+	B1	10.8	366	
T19	Oak	13	-	550	-	6	-	6	-	6	-	6	-	N/A	-	N/A	2	-	M	Reasonably dense canopy, moderate deadwood, evidence of past branch loss	Fair	Fair	20+	B1	6.6	137	
H20	Hawthorn, hazel,	1.5	-	100	-	0	-	0	-	0	-	0	-	N/A	-	N/A	N/A	-	M	Managed, some thinning.	Fair	Fair	10+	C2	1.2	5	
T21	Oak	3	-	600	#	1	-	1	-	1	-	1	-	N/A	-	N/A	0.5	-	M	Stem and top snapped out leaving a stump with regrowth.	Fair	Fair	10+	C1	7.2	163	
W22	Ash, willow, oak, hawthorn, goat willow, hazel, red oak, cypress.	19	-	600	-	As on plan								N/A	-	N/A	N/A	-	M	Dense woodland, mature trees away from boundary with hawthorn, goat willow frontage. Post and wire fence separates site from woodland. Pond within.	Fair	Good	20+	B2	7.2	163	
G23	Oak	14	-	700	-	As on plan								N/A	-	N/A	2.5	-	M	Two oaks grown together, individual RPAs plotted, evidence of past branch loss, high canopy site side, some canopy thinning in places.	Fair	Fair	20+	B2	8.4	222	
T24	Ash	13.5	-	550	-	6	-	7	-	6	-	7	-	N/A	-	N/A	2	-	M	Thin in canopy, ivy on stem, past branch loss, exposed roots.	Fair	Fair	10+	C1	6.6	137	
H25	Hawthorn, blackthorn, elder	1.5	-	80	-	As on plan								N/A	-	N/A	N/A	-	M	Managed thin in places, some gaps, low quality.	Fair	Fair	10+	C2	1.0	3	

Ref	Species	Height	Est	Stem dia	Est	Spread								Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary management recommendations	Structural Condition	Physiological Condition	ULE	Quality grading	RPA radius	RPA area	
						N	Est	S	Est	E	Est	W	Est	1st branch	Est	1st branch direction	Canopy									Est
G26	Ash	8	-	280	#	As on plan								N/A	-	N/A	2	-	M	Two ash, ivy on stems, thinning canopies, minor to, moderate deadwood .	Fair	Fair	10+	C2	3.4	35
T27	Oak	18	-	1,000	#	7	-	8	-	7	-	8	-	N/A	-	N/A	2	-	M	Large spreading canopy, past branch loss, dense canopy, moderate deadwood,	Fair	Good	20+	B1	12.0	452
T28	Oak	15	-	750	#	7	-	6	-	6	-	6	-	N/A	-	N/A	2	-	M	Past limb loss, cavity at base north west side with beef steak fungus within. Moderate deadwood, dense canopy	Fair	Fair	20+	B1	9.0	255
T29	Ash (Common)	17	-	750	-	8	-	7	-	7	-	7	-	N/A	-	N/A	2	-	M	Past limb loss, multiple branch failures, thinning canopy, moderate deadwood, ganoderma bracket on stem next to wound.	Fair	Fair	20+	B1	9.0	255
H30	Hawthorn, elder, holly,	2	-	100	-	As on plan								N/A	-	N/A	0	-	M	Dense, reasonably intact, some thinning and minor gaps, managed in past.	Fair	Fair	20+	C2	1.2	5
T31	Oak	18	-	900	-	5	-	7	-	8	-	4	-	N/A	-	N/A	3	-	M	On boundary with field, leans south east, dense canopy, roots observed in field, past branch loss	Fair	Fair	20+	B1	10.8	366
T32	Oak	15.5	-	900	-	7	-	9	-	7	-	9	-	N/A	-	N/A	2.5	-	M	Good shape, dense canopy, past branch loss, remains of a fruiting fungal body north side at base.	Fair	Good	20+	B1	10.8	366
G33	Hawthorn, hazel, blackthorn, elm	4.5	-	200	-	As on plan								N/A	-	N/A	N/A	-	M	Multiple she's on field boundary, thin, gappy, major deadwood throughout with some DED trees. Low quality.	Fair	Poor	<10	C2	2.4	18
T34	Willow	13	-	550	#	3	-	2	-	8	-	2	-	N/A	-	N/A	0.5	-	M	Willow leaning to east with regrowth stem fallen to east. Dense canopy.	Poor	Fair	10+	C1	6.6	137
H35	Blackthorn, hawthorn	1.5	-	60	#	As on plan								N/A	-	N/A	N/A	-	EM	Low quality, managed, thin and gappy,	Poor	Fair	<10	C2	0.7	2
T36	Oak	14	-	900	-	7	-	9	-	8	-	7	-	N/A	-	N/A	3	-	M	Good shape, minor ivy on stem, past branch loss, dense canopy, minor basal bark damage	Fair	Fair	20+	B1	10.8	366
T37	Oak	14	-	800	-	6	-	5	-	6	-	4	-	N/A	-	N/A	2	-	M	Immoderate deadwood, dense canopy, past branch loss.	Fair	Fair	20+	B1	9.6	290
H38	Hawthorn, blackthorn	1.5	-	80	-	As on plan								N/A	-	N/A	N/A	-	M	Intact, reasonably dense, managed.	Fair	Fair	10+	C2	1.0	3
T39	Oak	17	-	1,000	#	7	-	7	-	7	-	7	-	N/A	-	N/A	2	-	M	I large spreading canopy, minor deadwood, good shape, dense canopy.	Good	Good	40+	A1	12.0	452
T40	Ash (Common)	17	-	1,000	-	8	-	8	-	8	-	7	-	N/A	-	N/A	2.5	-	M	Ups reading canopy, large limbs, past bench loss, thinning canopy in places,	Fair	Fair	20+	B1	12.0	452
T41	Oak	8	-	450	#	1	-	4	-	2	-	6	-	N/A	-	N/A	2.5	-	M	Poor shape, ivy smothering the tree, limited canopy. Remove ivy and re-inspect.	Fair	Fair	<10	C1	5.4	92
T42	Oak	14	-	900	-	8	-	9	-	9	-	9	-	N/A	-	N/A	2	-	M	Dense canopy, past limb loss, moderate deadwood, snapped branch south side.	Fair	Fair	20+	B1	10.8	366
G43	Alder	7	-	280	#	As on plan								N/A	-	N/A	0.5	-	M	Group of alder trees set within shallow depression. Some dead and dying trees within, deadwood throughout, low quality.	Fair	Fair	20+	C2	3.4	35
G44	Elder, hawthorn, blackthorn	5	-	180	-	As on plan								N/A	-	N/A	N/A	-	M	Odense unmanaged group, some deadwood within, ditch on north side	Fair	Fair	20+	C2	2.2	15
G45	Oak	9	-	500	#	As on plan								N/A	-	N/A	3.5	-	M	Two oaks growing together, ivy on stems, set on earth embankment, thinning canopies, moderate deadwood, past branch loss.	Fair	Fair	20+	C2	6.0	113
T46	Alder (Common)	12	-	600	-	5	-	6	-	7	-	5	-	N/A	-	N/A	2	-	M	Reasonably dense canopy, some deadwood, minor snapped branches, union at 1m	Fair	Fair	20+	B1	7.2	163
T47	Hawthorn	6	-	200	-	3	-	3	-	3	-	3	-	N/A	-	N/A	1	-	M	Major deadwood, thin canopy, poor quality	Fair	Poor	<10	C1	2.4	18
T48	Oak	12	-	600	-	6	-	6	-	7	-	6	-	N/A	-	N/A	2	-	M	Moderate deadwood, multiple past file, snapped limb south east side with pruning wound, wound on west side, canopy is fairly dense, trampling at base.	Fair	Fair	10+	B1	7.2	163
T49	Ash (Common)	19	-	900	#	9	-	8	-	9	-	9	-	N/A	-	N/A	1.5	-	M	Dense ivy on stem and into crown, unable to inspect base, spreading canopy, some thinning and deadwood, evidence of past failures	Fair	Fair	20+	B1	10.8	366

Ref	Species	Height	Est	Stem dia	Est	Spread								Est	Crown clearance height				Life stage	General observations Physiological and structural condition. Preliminary management recommendations	Structural Condition	Physiological Condition	ULE	Quality grading	RPA radius	RPA area
						N	Est	S	Est	E	Est	W	1st branch		Est	1st branch direction	Canopy	Est								
G50	Hawthorn, blackthorn, hazel, ash, elm, oak, goat willow	5	-	160	#	As on plan								N/A	-	N/A	N/A	-	M	Dense mixed group on southern boundary. flailed field side, height between 3-6m, some thin areas along length.	Fair	Fair	20+	B2	1.9	12
T51	Oak	14	-	600	-	6	-	6	-	8	-	7	-	N/A	-	N/A	2	-	M	Reasonably dense canopy, woodpecker holes, moderate deadwood, some canopy thinning, on south side of ditch, past branch loss.	Fair	Fair	20+	B1	7.2	163
T52	Oak	15	-	950	#	8	-	8	-	8	-	8	-	N/A	-	N/A	1	-	M	Spreading canopy, very dense, some moderate deadwood and minor crown thinning in places, past branch loss,	Fair	Fair	20+	B1	11.4	408
G53	Sycamore, hazel, hawthorn	5	-	180	-	As on plan								N/A	-	N/A	N/A	-	EM	On raised embankment, unmanaged, low quality, , deadwood throughout.	Fair	Fair	10+	C2	2.2	15
G54	Alder	6	-	200	-	2	-	2	-	3	-	3	-	N/A	-	N/A	N/A	-	EM	Two alder, dense, set within hedgerow, ditch to north	Fair	Good	10+	B2	2.4	18
T55	Oak	15	-	800	-	6	-	6	-	8	-	7	-	N/A	-	N/A	2	-	M	Thinning canopy, major deadwood, past failures, ditch to north, woodpecker holes	Fair	Fair	20+	B1	9.6	290
T56	Sycamore	12.5	-	300	-	5	-	4	-	5	-	4	-	N/A	-	N/A	0.5	-	M	Ditch to north, ivy on stem and into canopy, reasonably dense canopy.	Fair	Fair	20+	C1	3.6	41
G57	Alder, sycamore, oak, hawthorn hazel, goat willow, elder	10	-	500	#	As on plan								N/A	-	N/A	N/A	-	M	Dense group with mature oak and alder within and hazel, hawthorn, elder, sycamore understory managed south side. Forms a very dense group.	Fair	Fair	20+	B2	6.0	113
G58	Hazel, elder	4	-	120	-	As on plan								N/A	-	N/A	N/A	-	M	Low quality, thin leaf cover, deadwood.	Fair	Poor	<10	U	1.4	7
H59	Hawthorn, sycamore, elder, elm	2	-	100	-	As on plan								N/A	-	N/A	N/A	-	M	Dense intact, managed	Fair	Good	20+	B2	1.2	5
H60	Sycamore, hazel, elder, hawthorn	2	-	100	-	As on plan								N/A	-	N/A	N/A	-	M	Dense intact, managed	Fair	Good	20+	B2	1.2	5
T61	Ash	13	-	550	#	5	-	6	-	5	-	5	-	N/A	-	N/A	0.5	-	M	Low canopy, within residential garden, pruned in past, ivy on stem, overhangs access drive up to 1m.	Fair	Fair	20+	B1	6.6	137
T62	Lucombe oak	24	-	1273	-	6	-	7	-	7	-	7	-	N/A	-	N/A	1	-	M	Large specimen, twin stem, ivy on one stem, hardstanding up to base, some crossing branches, cavity on northern stem, east side, minor deadwood.	Good	Good	40+	A1	15.3	733
H63	Privet	1.5	-	75	-	0	-	0	-	1	-	1	-	N/A	-	N/A	N/A	-	M	Unmanaged, intact, garden hedgerow	Fair	Fair	10+	C2	0.9	3
G64	Holly, ash, elder, cedar	7	-	200	#	As on plan								N/A	-	N/A	N/A	-	M	Mixed group to edit of driveway, holly tree mature with early mature ash and elder,	Fair	Fair	20+	C2	2.4	18

APPENDIX 3

TREE SURVEY PLAN

- KEY** BS 5837 : 2012 Categories
- Tree Category A - High Quality
 - A Category - Hedgerow, Group, Woodland
 - Tree Category B - Moderate Quality
 - B Category - Hedgerow, Group, Woodland
 - Tree Category C - Low Quality
 - C Category - Hedgerow, Group, Woodland
 - Tree Category U - Unsuitable for Retention
 - Root Protection Area to BS 5837:2012
 - Shrub Mass / Offsite Tree



Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

Revisions:
First Issue- 17/09/2015 AD

Tree Survey & Constraints Plan

Erlas Hall Farm

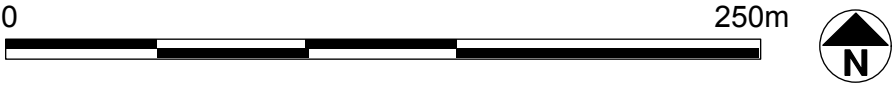
Client: Lightsource Renewable Energy Ltd

DRWG No: **L.0360_02** Sheet No: _ REV: _

Drawn by : AD Approved by: MP

Date: 17/09/2015

Scale: 1:2500 @ A1



APPENDIX 4

ARBORICULTURAL IMPACT SCHEDULE

		Arboricultural Impact Assessment Significance Matrix					
		Level of Impact					
		High	Medium	Low	Slight	None	
		e.g. removal required to facilitate development. Excessive root severance. Excessive above ground pruning. Hedgerows: >50% loss of overall length.	e.g root damage, soil compaction or above ground impacts tree management works unacceptable in terms of BS3998:2010. Hedgerows: >25% loss of overall length.	e.g. minor fine root loss, installation of no dig surfacing, temporary ground protection. Moderate tree works within the parameters of BS3998:2010. Hedgerows: 5-10% loss of overall length.	e.g.very minor works within root protection areas for example the installation of lightweight fencing or soft landscaping. Hedgerows: <5% loss of overall length.	E.g. trees located at a significant distance from development and construction activities.	
BS5837:2012 Quality Assessment Category	A	Major	Major	Moderate	Minor	None	Significance of effect
	B	Major	Moderate	Minor	Insignificant	None	
	C	Moderate	Minor	Insignificant	Insignificant	None	
	U	Minor	Minor	Insignificant	Insignificant	None	
		Significance of effect					

Significance of effect - definitions	
Major	Removal/acute damage to structural integrity/vitality/appearance of a high quality arboricultural feature. Depending on circumstances, may result in the loss of all/greater majority of public visual amenity value. Mitigation planting unlikely to be effective except in the long term (40+ years).
Moderate	In the case of damage: unlikely to give rise to tree death but likely to noticeably reduce vitality and deterioration of appearance in the short and medium term, with corresponding reduction in public visual amenity value where relevant. Tree removals that can be effectively mitigated in the medium term (20-40 years). For example notable crown dieback, foliage discolouration, low leaf density, or tree management works unacceptable in terms of BS3998:2010.
Minor	Short-term damage with limited distribution that can be reasonably compensated for by new growth. Unlikely to result in observable symptoms of damage in relation to structural integrity/vitality/appearance. No obvious impact on public visual amenity. Tree removals that can be mitigated in the short-term (10-20 years)
Insignificant	Minimal damage in very small amounts. No obvious impact on public visual amenity.
None	No impact to above or below ground components of tree reasonably anticipated.

No	Species	Quality	Arboricultural effects (direct and indirect) of proposed design - description	Unadjusted scale of effect	Unadjusted significance of effect (scale effects x quality)	Recommended mitigation	Adjusted scale of effect following mitigation	Adjusted significance of effect (adj .scale effects x quality)	Tree removal required
G1	Elder, bramble, hawthorn, hazel	C2	Small section to be removed to enable construction vehicle access. Potential direct impacts from new access road construction.	Medium	Minor	Removal works to be carried out in accordance with BS.3998:2010. Tree protection fencing to be installed prior to access road construction to protect retained elements.	Low	Insignificant	Partial
G2	Holly, elder	C2	Located away from main development. No impacts envisaged.	None	None	None	None	None	No
T3	Hawthorn	C1	Potential direct impacts from access road construction	Medium	Minor	Access construction to avoid RPA. Tree protection fencing to be installed prior to construction.	Low	Insignificant	No
T4	Sycamore	C1	Potential direct impacts from access road construction	Medium	Minor	Access construction to avoid RPA. Tree protection fencing to be installed prior to construction as shown on tree protection plan.	Low	Insignificant	No
H5	Hawthorn, elder, blackthorn	B2	Potential direct impacts from access road construction	Medium	Moderate	Access construction to avoid RPA. Tree protection fencing to be installed prior to construction as shown on tree protection plan.	Low	Minor	No
T6	Sycamore	B1	Potential direct impacts from access road construction	Medium	Moderate	Access construction to avoid RPA. Tree protection fencing to be installed prior to construction as shown on tree protection plan.	Low	Minor	No
G7	Sycamore, ash, hawthorn, holly, elm, cherry,	B2	Potential direct impacts from access road construction	Medium	Moderate	Access construction to avoid RPA. Tree protection fencing to be installed prior to construction as shown on tree protection plan.	Low	Minor	No
G8	Hazel, hawthorn,	C2	Potential direct contact from general construction activities.	Medium	Minor	Tree protection fencing to BS.5837:2012 to be installed prior to construction as shown on the tree protection plan.	Low	Insignificant	No
W9	Hornbeam, spruce, beech, holly, oak, sycamore, willow, ash, poplar	B2	Potential for direct contact from general construction activates with woodland tree species on the boundary with the site.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS.5837:2012 to be installed prior to main construction. Temporary tree protection fencing to BS.5837:2012 to be installed for areas of W9 that would not be afforded protection from the site security fence.	Low	Minor	No
G10	Alder	B2	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
T11	Oak	B1	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
G12	Hawthorn, holly,	B2	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
H13	Blackthorn, hawthorn, hazel	B2	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
T14	Oak	B1	Potential direct impacts from general construction activities. Pruning required to ensure clearance between canopy and security fence	Medium	Moderate	Site security fencing to acts as tree protection fencing to BS5837:2012 to be installed prior to main construction phase. Pruning to be undertaken in accordance with BS3998:2010	Low	Minor	No

No	Species	Quality	Arboricultural effects (direct and indirect) of proposed design - description	Unadjusted scale of effect	Unadjusted significance of effect (scale effects x quality)	Recommended mitigation	Adjusted scale of effect following mitigation	Adjusted significance of effect (adj .scale effects x quality)	Tree removal required
T15	Oak	B1	Potential direct impacts form general construction activities. Crown lift required on south side to enable security fence installation and provide clearance above proposed internal access road. Security fencing and internal access road to encroach within RPA.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction. Access road within the RPA to be installed using a no dig methodology, employing an appropriate above ground cellular confinement system. Pruning works to be undertaken in accordance with BS.3998:2010.	Low	Minor	No
H16	Hawthorn, blackthorn, elder, hazel	B2	Potential direct impacts from general construction activities. Potential small sections to be removed as part of the widening on the existing farm gate to allow internal access road construction.	Medium	Moderate	Sectional removals to be undertaken in accordance within BS.3998:2010. Temporary tree protection fencing to BS.5837:2012 to be installed prior to main construction.	Low	Minor	Partial
H17	Hawthorn, blackthorn, elder, holly, sycamore	B2	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
T18	Oak	B1	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
T19	Oak	B1	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
H20	Hawthorn, hazel,	C2	Potential direct impacts from general construction activities.	Medium	Minor	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Insignificant	No
T21	Oak	C1	Potential direct impacts from general construction activities.	Medium	Minor	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Insignificant	No
W22	Ash, willow, oak, hawthorn, goat willow, hazel, red oak, cypress.	B2	Potential direct impacts from general construction activities. Potential direct impacts from permanent maintenance access construction.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction. Temporary tree protection fencing to BS5837:2012 to be installed prior to access road construction. Access road to avoid excavations within RPAs.	Low	Minor	No
G23	Oak	B2	Potential direct impacts from general construction activities. Potential direct impacts from permanent maintenance access construction. Pruning required to outer canopy to ensure clearance for maintenance access.	Medium	Moderate	Temporary tree protection fencing to BS5837:2012 to be installed prior to construction activities. Pruning works to be carried out in accordance with BS.3998:2010. Access road within the RPA to ne installed using a no dig methodology, employing an appropriate above ground cellular confinement system.	Low	Minor	No
T24	Ash	C1	Potential direct impacts from access road construction.	Medium	Minor	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Insignificant	No
H25	Hawthorn, blackthorn, elder	C2	Potential direct impacts from access rad construction. Small section to be removed to enable site maintenance access.	Medium	Minor	Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction. Removal works to be carried out in accordance with BS.3998:2010.	Low	Insignificant	No
G26	Ash	C2	Potential direct impacts from access road construction.	Medium	Minor	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Insignificant	No
T27	Oak	B1	Potential direct impacts from access road construction.	Medium	Moderate	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Minor	No

No	Species	Quality	Arboricultural effects (direct and indirect) of proposed design - description	Unadjusted scale of effect	Unadjusted significance of effect (scale effects x quality)	Recommended mitigation	Adjusted scale of effect following mitigation	Adjusted significance of effect (adj .scale effects x quality)	Tree removal required
T28	Oak	B1	Potential direct impacts from access road construction.	Medium	Moderate	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Minor	No
T29	Ash (Common)	B1	Potential direct impacts from access road construction.	Medium	Moderate	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Minor	No
H30	Hawthorn, elder, holly,	C2	Potential direct impacts from construction activities. Small section to be removed to facilitate site security fence installation.	Medium	Minor	Removal works to be carried out in accordance with BS.5837:2012. Site security fencing to provide tree protection fencing to BS.5837:2012 for retained elements, to be installed prior to main construction phase.	Low	Insignificant	Partial
T31	Oak	B1	Potential direct impacts from access road construction.	Medium	Moderate	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Minor	No
T32	Oak	B1	Potential direct impacts from access road construction.	Medium	Moderate	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Minor	No
G33	Hawthorn, hazel, blackthorn, elm	C2	Potential direct impacts from access road construction.	Medium	Minor	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Insignificant	No
T34	Willow	C1	Potential direct impacts from access road construction.	Medium	Minor	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Insignificant	No
H35	Blackthorn, hawthorn	C2	Potential direct impacts from access road construction.	Medium	Minor	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Insignificant	No
T36	Oak	B1	Potential direct impacts from access road construction.	Medium	Moderate	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Minor	No
T37	Oak	B1	Potential direct impacts from access road construction.	Medium	Moderate	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Minor	No
H38	Hawthorn, blackthorn	C2	Potential direct impacts from access road construction.	Medium	Minor	Access road to be located outside of RPA. Temporary tree protection fencing to BS.5837:2012 to be installed prior to construction.	Low	Insignificant	No
T39	Oak	A1	Potential direct impacts from construction. Potential root damage from internal access road construction. Minor pruning required to outer canopy to ensure clearance of internal access road.	Medium	Major	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction. Access road within the RPA to be installed using a no dig methodology, employing an appropriate above ground cellular confinement system. Pruning works to be carried out in accordance with BS3998:2010	Low	Moderate	No
T40	Ash (Common)	B1	Potential direct impacts from construction. Potential root damage from internal access road construction. Minor pruning required to outer canopy to ensure clearance of internal access road.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction. Access road within the RPA to be installed using a no dig methodology, employing an appropriate above ground cellular confinement system. Pruning works to be carried out in accordance with BS3998:2010	Low	Minor	No
T41	Oak	C1	Potential direct impacts from access road construction.	Medium	Minor	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Insignificant	No

No	Species	Quality	Arboricultural effects (direct and indirect) of proposed design - description	Unadjusted scale of effect	Unadjusted significance of effect (scale effects x quality)	Recommended mitigation	Adjusted scale of effect following mitigation	Adjusted significance of effect (adj .scale effects x quality)	Tree removal required
T42	Oak	B1	Potential direct impacts from construction. Potential root damage from internal access road construction. Minor pruning required to outer canopy to ensure clearance of internal access road.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction. Access road within the RPA to ne installed using a no dig methodology, employing an appropriate above ground cellular confinement system. Pruning works to be undertaken in accordance with BS.3998:2010.	Low	Minor	No
G43	Alder	C2	Potential direct impacts from general construction activities.	Medium	Minor	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Insignificant	No
G44	Elder, hawthorn, blackthorn	C2	Potential direct impacts from general construction activities.	Medium	Minor	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Insignificant	No
G45	Oak	C2	Potential direct impacts from general construction activities.	Medium	Minor	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Insignificant	No
T46	Alder (Common)	B1	Potential direct contact from general construction activities.	Medium	Moderate	Tree protection fencing to BS.5837:2012 to be installed prior to construction as shown on the tree protection plan.	Low	Minor	No
T47	Hawthorn	C1	Potential direct contact from general construction activities.	Medium	Minor	Tree protection fencing to BS.5837:2012 to be installed prior to construction as shown on the tree protection plan.	Low	Insignificant	No
T48	Oak	B1	Potential direct contact from general construction activities.	Medium	Moderate	Tree protection fencing to BS.5837:2012 to be installed prior to construction as shown on the tree protection plan.	Low	Minor	No
T49	Ash (Common)	B1	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
G50	Hawthorn, blackthorn, hazel, ash, elm, oak, goat willow	B2	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
T51	Oak	B1	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
T52	Oak	B1	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
G53	Sycamore, hazel, hawthorn	C2	Potential direct impacts from general construction activities.	Medium	Minor	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Insignificant	No
G54	Alder	B2	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
T55	Oak	B1	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No
T56	Sycamore	C1	Potential direct impacts from general construction activities.	Medium	Minor	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Insignificant	No
G57	Alder, sycamore, oak, hawthorn hazel, goat willow, elder	B2	Potential direct impacts from general construction activities.	Medium	Moderate	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Minor	No

No	Species	Quality	Arboricultural effects (direct and indirect) of proposed design - description	Unadjusted scale of effect	Unadjusted significance of effect (scale effects x quality)	Recommended mitigation	Adjusted scale of effect following mitigation	Adjusted significance of effect (adj .scale effects x quality)	Tree removal required
G58	Hazel, elder	U	Potential direct impacts from general construction activities.	Medium	Minor	Site security fencing to act as tree protection fencing to BS5837:2012 to be installed prior to main construction.	Low	Insignificant	No
H59	Hawthorn, sycamore, elder, elm	B2	Located away from main development. No impacts envisaged.	None	None	None	None	None	No
H60	Sycamore, hazel, elder, hawthorn	B2	Located away from main development. No impacts envisaged.	None	None	None	None	None	No
T61	Ash	B1	Minor facilitation pruning may be required to ensure clearance on access road for construction vehicles.	Low	Minor	Pruning works to be carried out in accordance with BS.3998:2010	Slight	Insignificant	No
T62	Lucombe oak	A1	Facilitation pruning required to ensure clearance between canopy and construction vehicle access.	Medium	Major	Pruning works to be carried out in accordance with BS.3998:2011.	Low	Moderate	No
H63	Privet	C2	small section to be removed to facilitate construction access.	Medium	Minor	Removal works to be carried out in accordance with BS.3998:2010	Low	Insignificant	Partial
G64	Holly, ash, elder, cedar	C2	Located away from main construction. No impacts envisaged.	None	None	None	None	None	No

APPENDIX 5

TREE RETENTION/REMOVAL AND PROTECTION PLAN

- KEY

BS 5837 : 2012 Categories
- Tree Category A - High Quality

A Category - Hedgerow, Group, Woodland

Tree Category B - Moderate Quality

B Category - Hedgerow, Group, Woodland

Tree Category C - Low Quality

C Category - Hedgerow, Group, Woodland

Tree Category U - Unsuitable for Retention

Root Protection Area to BS 5837:2012

Shrub Mass / Offsite Tree

Tree / Hedgerow to be Removed

Tree Protection Barrier to BS 5837:2012

Site Security Fencing - to act as protection fencing to BS 5837:2012

Area of 'No Dig' Construction - above ground cellular confinement system

Construction Access

Maintenance Access
- The map illustrates the proposed construction site at Erlas Hall Farm, detailing the retention and removal of trees and hedgerows. The site is bounded by a post and wire fence. Key features include:

 - Tree Categories:** Trees are categorized according to BS 5837:2012. Category A (High Quality) is shown in green, Category B (Moderate Quality) in blue, Category C (Low Quality) in grey, and Category U (Unsuitable for Retention) in red.
 - Protection Barriers:** Dashed lines indicate the Tree Protection Barrier to BS 5837:2012. Dotted lines show Site Security Fencing to act as protection fencing to BS 5837:2012.
 - Construction Access:** Orange lines represent construction access routes, including a temporary construction access route that should be located to avoid canopy and RPAs.
 - Maintenance Access:** Blue lines represent maintenance access routes.
 - Root Protection Areas (RPAs):** Pink dashed circles indicate the Root Protection Area to BS 5837:2012 for specific trees.
 - Shrub Mass / Offsite Trees:** Black outlines represent shrub masses or offsite trees.
 - Site Compound:** A designated area for construction activities, outlined in orange.
 - Other Features:** The map includes labels for various trees and hedgerows (e.g., T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T20, T21, T22, T23, T24, T25, T26, T27, T28, T29, T30, T31, T32, T33, T34, T35, T36, T37, T38, T39, T40, T41, T42, T43, T44, T45, T46, T47, T48, T49, T50, T51, T52, T53, T54, T55, T56, T57, T58, T59, T60, T61, T62, T63, T64, T65, T66, T67, T68, T69, T70, T71, T72, T73, T74, T75, T76, T77, T78, T79, T80, T81, T82, T83, T84, T85, T86, T87, T88, T89, T90, T91, T92, T93, T94, T95, T96, T97, T98, T99, T100, T101, T102, T103, T104, T105, T106, T107, T108, T109, T110, T111, T112, T113, T114, T115, T116, T117, T118, T119, T120, T121, T122, T123, T124, T125, T126, T127, T128, T129, T130, T131, T132, T133, T134, T135, T136, T137, T138, T139, T140, T141, T142, T143, T144, T145, T146, T147, T148, T149, T150, T151, T152, T153, T154, T155, T156, T157, T158, T159, T160, T161, T162, T163, T164, T165, T166, T167, T168, T169, T170, 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