



For and on behalf of
Endurance Energy Wickham Hall Ltd

Flood Risk Assessment / Drainage Strategy

**Proposed Solar Farm at Wickham Hall Estate,
Bishops Stortford,
Hertfordshire**

**Prepared by
Sustainable Development and Delivery
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APPENDICES

- Appendix A Consultation with LLFA**
- Appendix B Proposed Development**
- Appendix C Historic Drainage Maps**

1.0 INTRODUCTION

- 1.1 This Flood Risk Assessment (FRA) has been prepared by the Sustainable Development and Delivery Team (SDD) of DLP Planning Ltd.
- 1.2 It has been provided to support a forthcoming planning application for a solar farm within the land ownership of Wickham Hall Estate on the outskirts of Bishop's Stortford.
- 1.3 A central OS grid reference is X: 546648, Y: 223072 and the nearest post code is CM23 1JG. An indicative site location is included as **Figure 1.1**.



Figure 1.1: Site Location Plan

- 1.4 This FRA considers the local sources of flood risk and assesses the potential implications both to and resulting from the development proposals.
- 1.5 It also considers the impact of the development proposals on the surface water runoff regime, and sets out a conceptual strategy to manage these appropriately.
- 1.6 The Local Planning Authority (LPA) for this site area is Uttlesford District Council (UDC) and

the Lead Local Flood Authority (LLFA) is Essex County Council (ECC).

- 1.7 The local sewerage provider for the site is Thames Water Utilities Ltd (TW), although with the site close to the area that is covered by Anglian Water Services Ltd (AW).
- 1.8 A site walkover was completed in April 2021, to inform the understanding of the surface water drainage regime, on-site drainage features and potential flooding constraints.

Brief Planning Background

- 1.9 By way of a background, planning applications were previously submitted in October 2021 for the construction and operation of solar farm with a combined output capacity of up to 49.9MW. One planning application was submitted to Uttlesford District Council (UDC) and another to East Hertfordshire District Council (EHDC).
- 1.10 The planning application for the part of the site within EHDC (planning reference 3/21/2601/FUL) was validated on 30th November 2021. Following some negotiations and scheme amendments, the planning application was approved subject to resolution of a unilateral undertaking and conditions. It should be noted that an FRA/Drainage Strategy was prepared by the SDD Team of DLP Planning Ltd (Ref H5324-4PD-R1) to support both applications.
- 1.11 The planning application for the part of the site within UDC (planning reference UTT/21/3108/FUL) was refused in April 2022.
- 1.12 In terms of the flood risk and drainage, ECC as the LLFA for the part of the site within UDC advised on 10th March 2022 that they did not object to the proposed development subject to planning conditions, as set out below and included as **Appendix A**.

Condition 1 – No works until a detailed surface water drainage scheme for the site, based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the development, has been submitted to and approved in writing by the local planning authority.

Condition 2 – No works shall take place until a scheme to minimise the risk of offsite flooding caused by surface water run-off and groundwater during construction works and prevent pollution has been submitted to, and approved in writing by, the local planning authority. The scheme shall subsequently be implemented as approved.

Condition 3 – Prior to start of construction a maintenance plan detailing the maintenance arrangements including who is responsible for different elements of the surface water drainage system and the maintenance activities/frequencies, has been submitted to and agreed, in writing, by the Local Planning Authority.

Condition 4 – The applicant or any successor in title must maintain yearly logs of maintenance which should be carried out in accordance with any approved Maintenance Plan. These must be available for inspection upon a request by the Local Planning Authority.

Relevant Planning Policy and Documents

- 1.13 A Preliminary Flood Risk Assessment (PFRA) for the area was produced by ECC in January 2011. This provides an overview of local flood risk based on a review of records of flooding and data derived from modelling of potential future flooding.

Proposed Development

- 1.14 The proposed development of the site is to provide a solar farm, with the layout included as **Appendix B**. This shows a series of solar panels distributed evenly across the majority of the site. The panels would be laid out in east to west rows and spaced to avoid shading.
- 1.15 The layout of the proposed development has taken account of a number of existing constraints:
- All existing tree cover is to be buffered to 10m to allow for shading and root protection areas.
 - All ancient and semi-natural woodland is to be buffered to 15m.
 - All existing hedgerows are to be buffered to 5m to allow for maintenance.
 - All public rights of way are to be buffered to 2.5m either side to proposed hedgerows.
 - All proposed security fencing is to be buffered to 5m to proposed panels.
- 1.16 The solar panels will be mounted onto metal frames that are installed and anchored in accordance with geotechnical requirements. The lower edge of the solar panel would be 1.0m from the ground and a maximum height of 2.9m from ground level to the top of the panel frame.
- 1.17 There will be an access track located along a part of the southern boundary with this leading north into the centre of the site. The access track would connect to a compound area where infrastructure associated with the generation, transforming and connection of electrical power to the grid would be located. The access track and these compound areas would be formed and surfaced with gravel.

2.0 BASELINE CONDITIONS

- 2.1 The site is part of a larger land area within the Wickham Hall Estate and located on the western edge of Bishop's Stortford in Hertfordshire.
- 2.2 There are two woodland areas bordering the site, Bailey Hills to the north-eastern boundary and Bloodhounds Wood adjacent to the south-western boundary. There are open agricultural fields adjacent to the western, north-western and south-eastern site boundaries..
- 2.3 The site has a land area of approximately 33.33 ha. The site is comprised of an undeveloped greenfield area of land, with a track along the north-eastern boundary and another track passing through the southern part of the site.

Topography

- 2.4 Ground levels and contours from OS mapping have been reviewed, with an OS map extract included as **Figure 2.1** and with levels from a LiDAR DTM included as **Figure 2.2**.

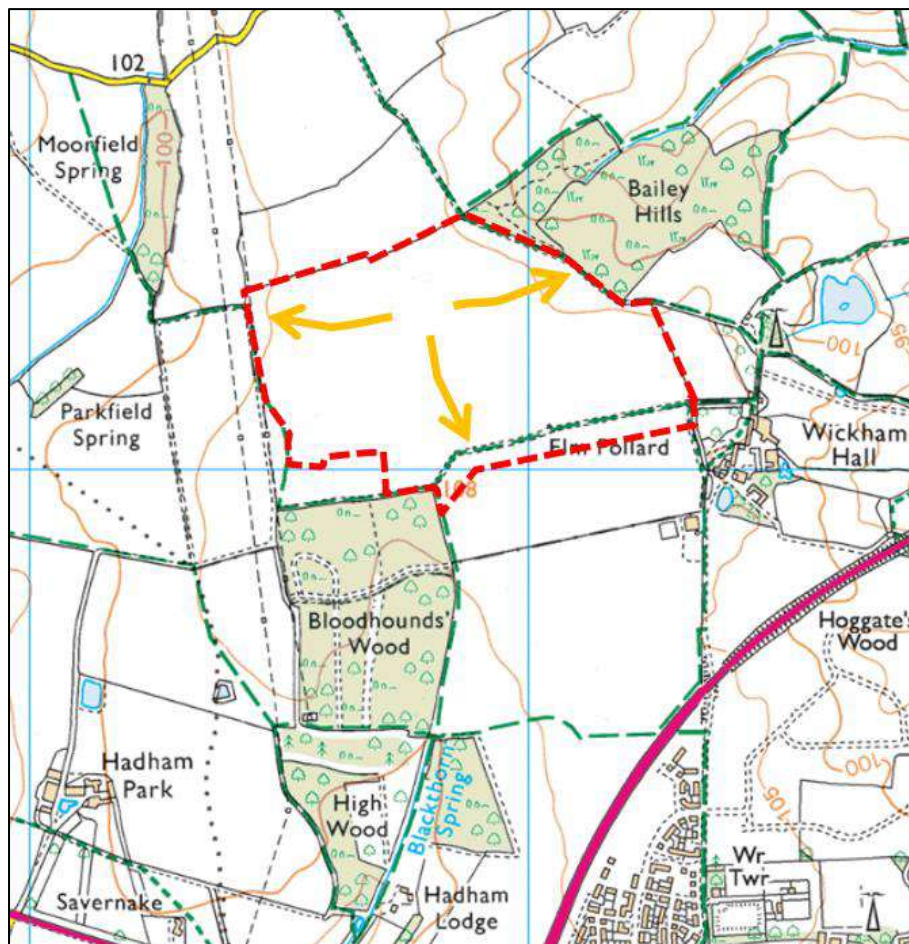


Figure 2.1: Topographical Levels Across the Site (OS Contours)

- 2.5 Ground levels across the site are reasonably flat, although with the OS contours and LiDAR DTM indicating a slight fall in ground levels in the western part of the site to the west and in

the central part of the site to the east towards Bailey Hills and south towards Bloodhounds Wood.

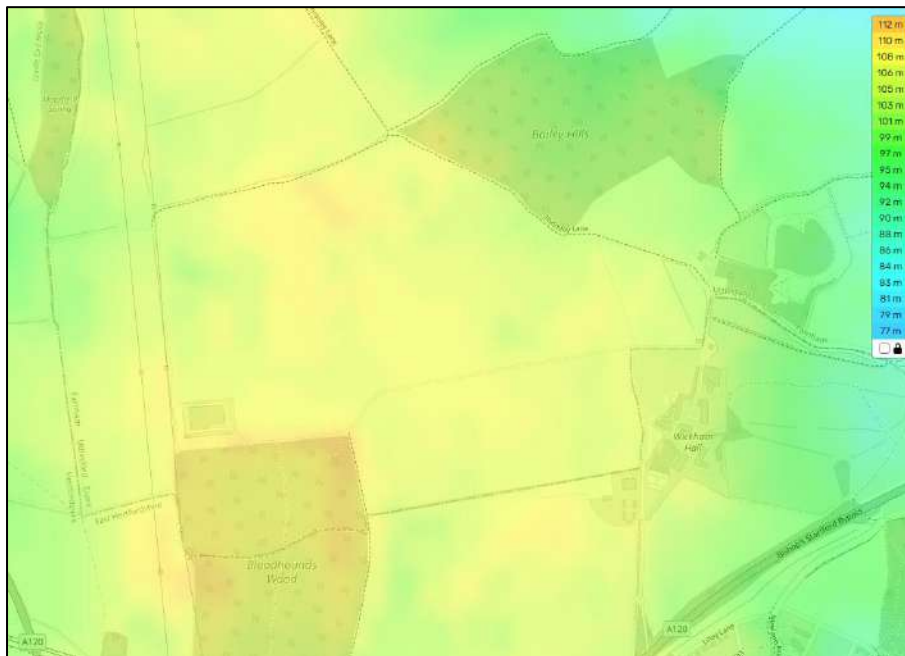


Figure 2.2: Topographical Levels Across the Site (LiDAR DTM)

Geology

- 2.6 The 1 to 50,000 scale British Geological Survey (BGS) online mapping (Geology of Britain Viewer) provides an understanding of the bedrock geology and also whether there are any superficial deposits recorded.
- 2.7 The bedrock geology under the site is shown to be of the London Clay Formation, which is a sedimentary bedrock comprised of clay, silt and sand.
- 2.8 There is a superficial deposit of diamicton under the site, described as an unsorted to poorly sorted deposit with particles ranging in size from clay to boulders, suspended in a matrix of mud or sand. There is an area of the Kesgrave Catchment Subgroup in the western part of the site, described as a sedimentary deposit of sand and gravel.

Hydrogeology

- 2.9 Aquifer designations are classified by the BGS and EA for the underlying bedrock and also for the superficial drift.
- 2.10 The BGS and EA jointly provide a dataset that classifies the aquifer designations for England and Wales. The different designations reflect the importance of aquifers in terms of groundwater as a resource and also in supporting surface water flows. The data is useful for considering the sensitivity of groundwater from a proposed development and also the potential for groundwater to have an impact in terms of groundwater flooding.

- 2.11 The site is not classified as being upon an aquifer for the bedrock geology. It is therefore understood that the underlying rock layers have a low permeability and are of negligible significance for water supply or river base flow.
- 2.12 The site is classified as being upon a Secondary (undifferentiated) Aquifer for the superficial deposits. This classification is used in cases where it has not been possible to attribute as either a Secondary A or B Aquifer. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
- 2.13 The BGS also provide a Groundwater Vulnerability Map, which shows the vulnerability of groundwater to a pollutant discharged at ground level. This is based on the hydrological, geological, hydrogeological and soil properties within a mapped area to give a high, medium or low classification.
- 2.14 The western part of the site is shown to be in an area where the groundwater vulnerability is low, and the eastern part where the vulnerability is medium-low. In addition, the eastern part of the site is shown to have a soluble rock risk, which means that there may be solution features that enable rapid movement of pollutant.
- 2.15 Source Protection Zones (SPZs) define areas around large and public potable groundwater abstraction sites, giving a classification for 3 main zones (SPZ 1, 2 or 3). The purpose of SPZs is to provide additional protection to safeguard drinking water quality through constraining the proximity of an activity that may impact upon drinking water abstraction.
- 2.16 The EA has designated the site to be outside of SPZ 1 and SPZ 2 but to be within the Total Catchment (SPZ 3). This is defined as the area needed to support the abstraction or discharge from the protected groundwater source.

Soils

- 2.17 The Cranfield University Soilscales website provides a simplified data-set at 1:250,000 scale. This gives a general understanding of the variations between different soil types across England and Wales, and how these affect the environment.
- 2.18 This identifies the soils across the site to be clayey and some loamy, with these types of soil typically having slightly impeded drainage.

Hydrology

- 2.19 The River Ash is approximately 1.7km from the western boundary of the site and the River Stort approximately 2.4km from the eastern boundary. These are both classified as Main Rivers.
- 2.20 There are no watercourses within the site area. However, Cradle End Brook is located to the west, draining south-west to adjoin the River Ash. There is also a drainage channel to the south known as Blackthorn Spring, which rises on the east side of Bloodhounds Wood,

draining south to also adjoin the River Ash. These are both also classified as Main Rivers.

- 2.21 There are a number of drainage channels and springs near to the site typically, around the field boundaries. During the site visit, these were found to be dry but that there were some low levels in parts of the channels where water could collect and be stored.
- 2.22 In addition, information provided for the site indicates the presence of underground drainage pipes within the area, including within part of the site. Historic maps showing these drainage pipes are included as **Appendix C**. The site is mainly in the area titled “The Great Field”, but also with the part to the south within the area titled “15 & 11 Acres”.
- 2.23 The condition of this drainage arrangement is not known, however it should be assumed that they currently help to drain the site. It would be necessary to ensure that the construction works do not impact upon the existing underground drainage pipes and if they were damaged, that appropriate remedial works would be completed.

3.0 STATUTORY PLANNING POLICY

- 3.1 The revised NPPF was published in July 2018 and the latest update was published in December 2023. This sets out the Government’s national policies for flood risk management in a land use planning context within England.
- 3.2 The Planning Practice Guidance (PPG) then sets out how to apply the NPPF.
- 3.3 The LPA has a statutory obligation to consult the EA on all applications in flood risk zones. The EA will then consider the effects of flood risk in accordance with the NPPF.
- 3.4 In terms of the flood risk classification, the NPPF categorises this into Flood Zones:
- Flood Zone 1 – Low probability (< 1 in 1000 years);
 - Flood Zone 2 – Medium probability (1 in 1000 to 1 in 100 years);
 - Flood Zone 3a – High probability (> 1 in 100 years) and;
 - Flood Zone 3b – Functional floodplain (typically >1 in 20 years).
- 3.5 The NPPF requires an FRA where there is land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use, so that it can assess the flood risks to and resulting from the proposed development and to provide appropriate measures to mitigate and manage these.
- 3.6 The NPPF classifies different types of land use and development in accordance with their vulnerability to flooding. This uses a classification of Highly Vulnerable, More Vulnerable and Low Vulnerable also Essential Infrastructure and Water Compatible Development.
- 3.7 The NPPF then sets out a matrix based on the results of the Flood Zones and the Flood Risk Vulnerability Classification to indicate whether the proposed land use or development would normally be considered appropriate for location in that particular area.
- 3.8 The NPPF classifies utility infrastructure as Essential Infrastructure. This is considered to be appropriate for locating in Flood Zones 1 and 2. If required, Essential Infrastructure can also be located in Flood Zone 3a and 3b, subject to passing the Exception Test.
- 3.9 In addition, sites with an area >1 ha also require an FRA to be provided. This is due to the potential for the development of such a land area to impact upon the surface water runoff regime and, as a consequence, to change the flooding over the site and surrounding area.

Sequential Test and Exception Test

- 3.10 The NPPF states that development should be located in flood zones with the lowest probability of flooding. This should be achieved by application of the Sequential Test, which aims to steer new development to areas with the lowest probability of flooding.
- 3.11 Where new development is proposed in areas of higher risk, the policy aims to make it safe without increasing flood risk elsewhere and where possible, reducing flood risk overall.

- 3.12 In flood-affected areas, the Exception Test is a method to demonstrate that the flood risk to people and property will be managed satisfactorily. This can allow necessary development to go ahead in situations where suitable sites at a lower level of risk are not available.
- 3.13 The Exception Test requires a proposed development to demonstrate that it will:
1. Provide wider sustainability benefits to the community that outweigh flood risk, and;
 2. That it will be safe for its lifetime, without increasing flood risk elsewhere and, where possible, to reduce flood risk overall.

Summary

- 3.14 The proposed development would be classified as Essential Infrastructure and the site is wholly located in Flood Zone 1.
- 3.15 The NPPF advises that this is an appropriate use of land. Therefore, the Sequential Test and Exception Test have been adequately demonstrated.
- 3.16 However, as the site area is greater than 1 ha, an FRA is required.
- 3.17 This would need to assess the flood risk to and resulting from the proposed development of the site, in particular to outline a surface water drainage strategy to demonstrate that the proposed development would not adversely impact surface water drainage or flood risk.

4.0 FLOOD RISK

- 4.1 An assessment of flood risk sources to the site and surrounding areas and resulting from the proposed development has been completed.
- 4.2 This has determined the requirement for any mitigation measures to make the development safe from flooding and/or to manage adverse flood risks that may result elsewhere.

Fluvial and Tidal Flooding

- 4.3 An extract of the Flood Map for Planning showing the extent of fluvial and/or tidal flooding in the vicinity of the site is shown in **Figure 4.1**.
- 4.4 The site is wholly located in Flood Zone 1. This is an area defined as having a less than 1 in 1,000 annual probability of river or sea flooding and considered to be at a low risk of flooding from these sources.
- 4.5 There are Main Rivers in the wider area but that do not have flood extents associated with them. This includes Cradle End Brook, located to the west of the site and draining south-west to adjoin the River Ash, and Blackthorn Spring, which rises on the east side of Bloodhounds Wood and draining south to also adjoin the River Ash.
- 4.6 Although the potential flooding associated with these watercourses is not mapped, it was considered that the distance of these watercourses from the site would limit any associated flood risk.

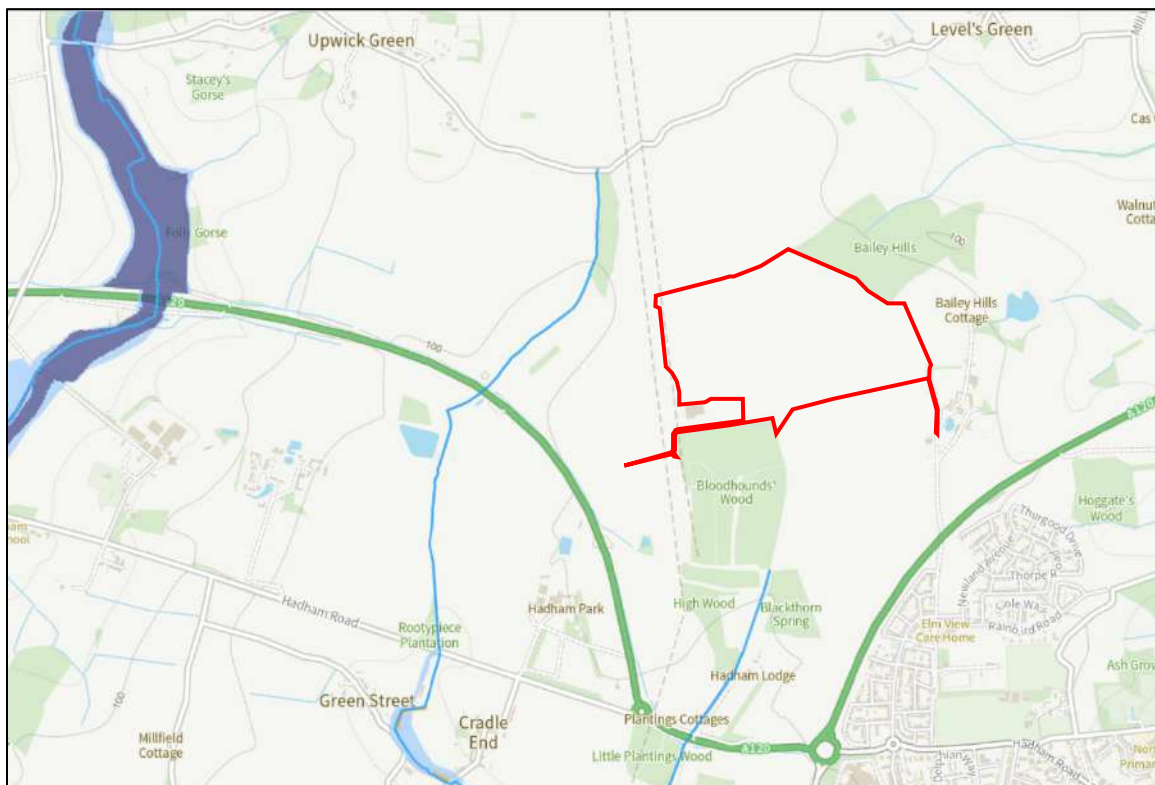


Figure 4.1: Environment Agency Flood Map for Planning

- 4.7 In accordance with the guidance on development and flood risk, outlined earlier in this FRA, all land uses are considered appropriate for areas classified as Flood Zone 1.
- 4.8 The risk of fluvial and tidal flooding affecting the site is therefore considered to be low.

Surface Water Flooding

- 4.9 Surface water flooding is a result of overland flow that can follow a rainfall event, before the runoff enters a watercourse or sewer. This form of flooding is usually associated with high intensity rainfall events but can also occur with lower intensity rainfall or from melting snow where the ground is saturated, frozen, developed or otherwise has a low permeability.
- 4.10 An extract of the Long Term Flood Map showing the conveyance flow paths and ponding resulting from surface water flooding in the vicinity of the site is shown in **Figure 4.2**.
- 4.11 Dark blue areas indicate surface water flooding with a 1 in 30-year chance of occurrence; blue indicates surface water flooding with a 1 in 100-year chance of occurrence; and light blue indicates surface water flooding with a 1 in 1000-year chance of occurrence.

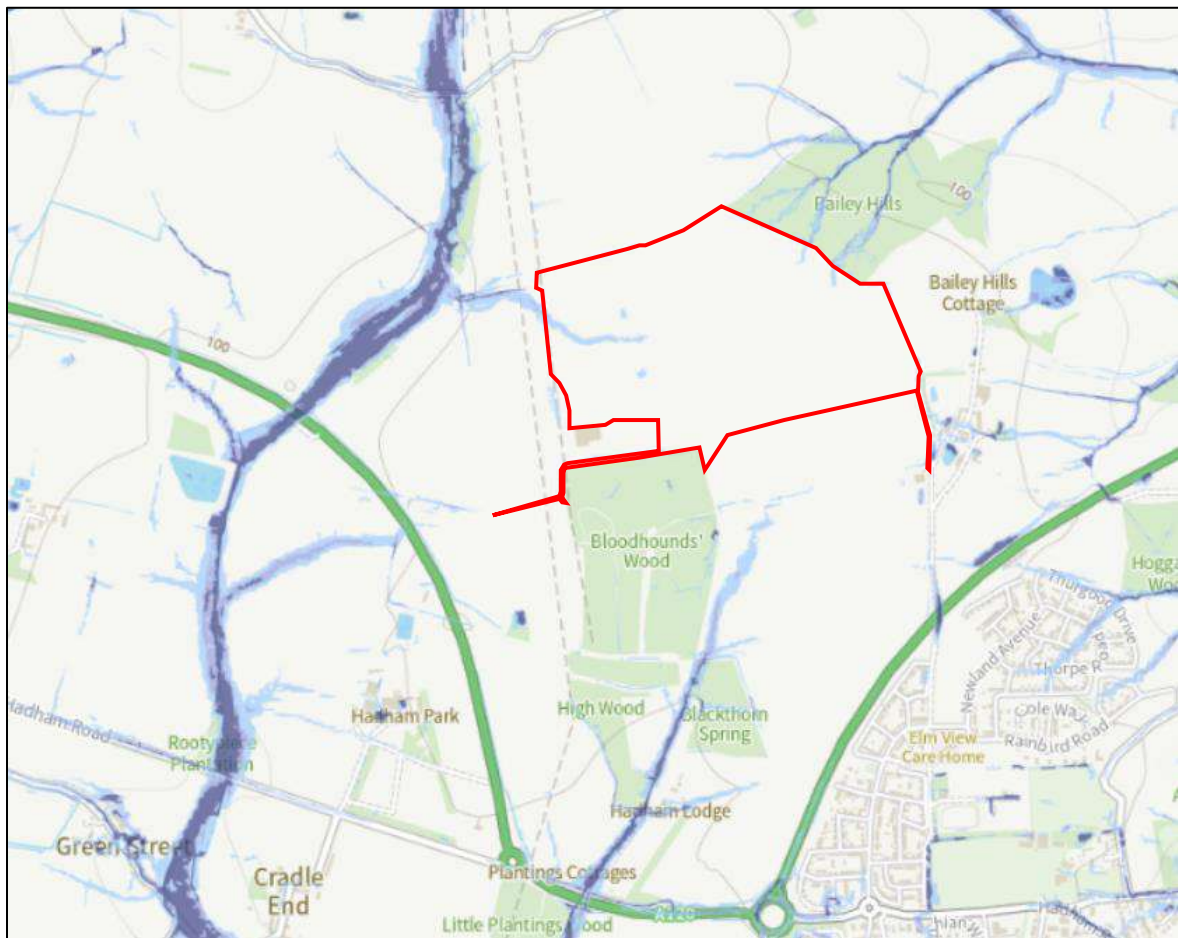


Figure 4.2: Long Term Flood Map – Surface Water Flooding

- 4.12 The Long Term Flood Map shows the majority of the site to be unaffected by surface water

flooding. There is a surface water flow path in the western part of the site, flowing west. There is another along the southern site boundary, adjacent to Bloodhound's Wood. There are also flow paths in the north-eastern part of the site, flowing north-east through Bailey Hills. The surface water flooding looks to be conveyance flow paths, and of limited extent.

- 4.13 The Long Term Flood Map provides modelled information of the possible water depth and flow velocity resulting from surface water flooding. Water depth is classified in three categories – greater than 900mm, between 300mm and 900mm and below 300mm. Flow velocity is classified in two categories – over 0.25 m/sec and less than 0.25 m/sec.

Water Depth

- 4.14 For the flood event with a low risk of occurrence, the water depth is generally with a depth below 300mm. There are some localised areas where the depth could be between 300mm and 900mm. There are no locations where the depth is greater than 900mm.
- 4.15 For the flood event with a medium and high risk of occurrence, the flood extent is less and with a reduced area affected and with no locations where the depth is greater than 300mm.

Flow Velocity

- 4.16 For the flood event with a low risk of occurrence, the flow velocity within the flood extent could typically be over 0.25 m/sec.
- 4.17 For the flood events with a medium and high risk of occurrence, the flow velocity within the flood extent is still typically over 0.25m/sec, but the flood extent is less.
- 4.18 The risk of surface water flooding across the majority of the site is therefore considered to be low. However, the parts of the site where there is shown to be a surface water flooding flow path would need to be considered further to ensure that this does not adversely affect or be affected by the proposed development.

Infrastructural Flooding

- 4.19 Infrastructural flooding occurs when sewerage systems are overwhelmed, resulting in them surcharging. This may occur alone or be combined with other sources of flooding.
- 4.20 The public sewerage authority for the area is Thames Water (TW), although billed by Affinity Water. Asset information from TW was not available at the time of writing this appraisal, and the location of public sewerage asset in the vicinity of the site is not known.
- 4.21 The closest public sewers are likely to be associated with the nearest developed areas, which would be from Bishop's Stortford to the east of the site. Given the topography in this area, if any sewers were to surcharge, they are unlikely to pose a flood risk to the site.
- 4.22 The risk of infrastructure flooding affecting the site is therefore considered to be low.

Groundwater Flooding

- 4.23 Groundwater flooding tends to be associated with areas underlain by Principal Aquifers and

increasingly also in areas with more localised floodplain sands and gravels. The site is not classified as being upon an aquifer for the bedrock geology. However, the site is classified as being upon a Secondary (undifferentiated) Aquifer for the superficial deposits.

- 4.24 The PFRA for HCC provides a map of areas susceptible to groundwater flooding, with an extract shown as **Figure 4.3**. This shows the degree to which areas are susceptible to groundwater flooding on the basis of geological and hydrogeological conditions. It does not show the likelihood of groundwater flooding occurring (i.e. it is a hazard not risk-based dataset).
- 4.25 The site is shown to be within an area where the susceptibility to groundwater flooding is less than 25%, which is towards the lower end of the range of susceptibilities.
- 4.26 Based on the underlying geology and hydrogeology and the information provided in the PFRA for HCC, the risk of groundwater flooding affecting the site is considered to be low.

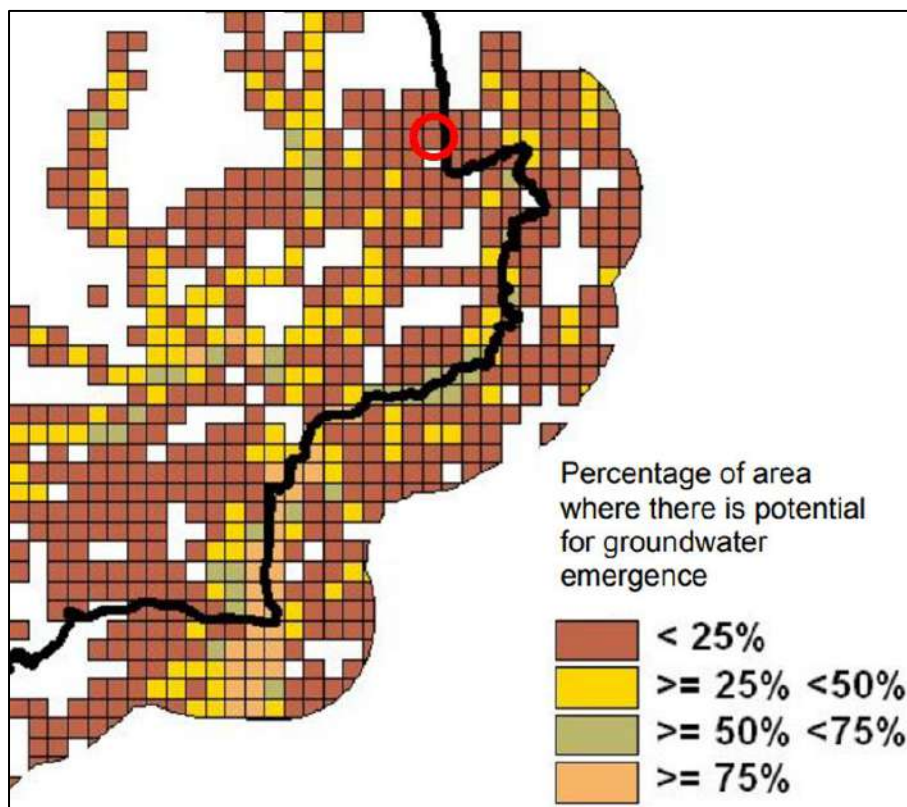


Figure 4.3: Map of Areas Susceptible to Groundwater Flooding

Artificial Sources of Flooding

- 4.27 Artificial sources of flooding can include non-natural or other sources of flooding, such as reservoirs, lakes and canals. The proximity of such features should therefore be assessed.
- 4.28 There are no nearby canals, and therefore no flood risk from this source. There are some impounded waters to the west of the site and close to Hadham Hall, however ground levels

fall in this direction and as such there is no flood risk from this source.

- 4.29 In addition, the Long Term Flood Map shows the areas that could be affected should there be a reservoir breach or failure. The site is not shown to be within an affected area.
- 4.30 The risk from artificial sources of flooding is therefore considered to be low.

Mitigation and Management Measures

- 4.31 Based on the assessment of flood risk sources, the following mitigation and management measures are suggested.
- 4.32 A surface water drainage strategy will be incorporated into the development layout which will include measures for managing surface water runoff and the surface water flow paths. The surface water drainage strategy for the site is described in the next section of this FRA.
- 4.33 The Long Term Flood Map shows the majority of the site to be unaffected by surface water flooding. However, there are some flow paths within the site, in the western part of the site, flowing west; along the southern site boundary, adjacent to Bloodhound's Wood; and in the north-eastern part of the site, flowing north-east through Bailey Hills.
- 4.34 Water depth within these flow paths is generally below 300mm and with some localised areas where the depth could be between 300mm and 900mm but not with a depth greater than 900mm. Flow velocity within the flood extent could typically be over 0.25 m/sec.
- 4.35 The solar panels would be mounted on a frame, with the lower edge elevated above the ground. This is illustrated in **Figure 1.2**, which illustrates that the lower edge of the solar panels would typically be less than 900mm from the ground. Other sensitive components of the solar panels would also be elevated.
- 4.36 The frames would be installed and anchored in accordance with a geotechnical investigation. Consideration would be given to the potential presence of underground drainage, with care taken with the installation of the solar panel frames.
- 4.37 The frames would be designed to keep the solar panels in-situ for such things as high winds and also surface water flows. The flow velocity associated with the surface water flow paths across the site is typically over 0.25m/sec. It will therefore be necessary to ensure that any frames installed in these areas would withstand such flows.
- 4.38 The location of the power station compounds has been informed by the surface water flow paths, and located to avoid an impact both from and to surface water flooding.

5.0 SURFACE WATER DRAINAGE STRATEGY

- 5.1 It is well understood that one of the effects of development is typically to reduce the permeability of the site and consequently to change its response to rainfall.
- 5.2 A drainage strategy is required to ensure that surface water is appropriately managed so that the development would not increase flood risk on the site and to surrounding areas.
- 5.3 The key components of a Surface Water Drainage Strategy are to:
- Consider the potential for infiltration of water into the ground;
 - Determine an appropriate and available discharge receptor, selected in accordance with the sustainable discharge hierarchy;
 - The conveyance routes across and from the site, taking into consideration the topography, layout and levels of drainage features and infrastructure; and
 - Assess the impact of the development on the surface water runoff regime, and the mitigation measures to be used to manage these to an acceptable level.

Sustainable Discharge Hierarchy

- 5.4 The guidance on the use of SuDS in development proposals refers to what is described as the sustainable discharge hierarchy. This is defined in the NPPF and shown in **Figure 5.1**.
- 5.5 The aim should be to discharge surface water runoff as high up the hierarchy as reasonably practicable, and to demonstrate the reasoning behind the decision-making process.

1. into the ground (infiltration);
 2. to a surface water body;
 3. to a surface water sewer, highway drain, or another drainage system;
 4. to a combined sewer.
- Particular types of sustainable drainage systems may not be practicable in all locations. It could be helpful therefore for local planning authorities to set out those local situations where they anticipate particular sustainable drainage systems not being appropriate.

Figure 5.1: Sustainable Discharge Hierarchy

Into the ground (infiltration):

- 5.6 Based on the underlying substrate, an infiltration-led drainage solution is likely to be limited across large parts of the site, although localised infiltration is still anticipated to naturally occur. There are also localised deposits of sand and gravel in the western part of the site, where infiltration to ground would perhaps be less limited.

To a surface water body:

- 5.8 There are no watercourses within the site area. Cradle End Brook is located to the west, draining south-west to adjoin the River Ash. There is also a drainage channel to the south known as Blackthorn Spring, which rises on the east side of Bloodhounds Wood, draining south to also adjoin the River Ash. There are a number of drainage channels and springs near to the site, as indicated by the surface water flow paths.

To a surface water sewer, highway drain, or another drainage system:

- 5.9 It is not known whether there is sewerage or highway drainage infrastructure in the area, however a connection from the site to this is not considered to be appropriate or required.

To a combined sewer:

- 5.10 Combined sewerage systems are those that convey both foul and surface water. It is not known if there is sewerage infrastructure in the area. A connection to a combined sewerage system is not considered to be appropriate or required.

Summary:

- 5.11 Infiltration into the underlying substrate is anticipated to be limited across large parts of the site although the substrate in the western part of the site is understood to include localised deposits of sand and gravel, which may enable some localised infiltration in this area. Prior to commencement of development infiltration testing will be undertaken to confirm this. For the purpose of this drainage strategy an attenuation-led drainage strategy is therefore proposed, with discharge to a surface water body.
- 5.12 Ground levels across the site are reasonably flat, although with the OS contours indicating a slight fall in ground levels in the western part of the site to the west and towards Cradle End Brook. Whereas in the central part of the site, there is a fall in ground levels to the east towards Bailey Hills and south towards Bloodhounds Wood and Blackthorn Spring.

Developmental Drainage Impacts

- 5.13 Given the nature of the proposed development, there is a low level of impact on the surface water runoff regime. This reduces the need for mitigation and management measures.
- 5.14 The layout of the solar panels across the site, the on-site power stations and also the substation compounds are shown in the layout drawing included as **Appendix B**.
- 5.15 The solar panels would be mounted at an angle on a frame, with the lower edge elevated above the ground. The solar panels would be mounted on frames installed and anchored in accordance with geotechnical requirements. Consideration would be given to the potential presence of underground drainage. The frame would provide sufficient anchoring to keep the solar panels in-situ for such things as high winds and surface water flows.
- 5.16 The proposed development would also include a number of substation compounds across

the site containing a transformer and switchgear, with these to be located within a small gravel surfaced compound and connected with a spur from the access tracks.

- 5.17 A gravel surfaced compound is also located in the southern part of the site, adjacent to Bloodhounds Wood. This contains the battery storage containers, other storage containers and infrastructure, including a DNO substation, client switch room, comms building and storage building.
- 5.18 Access tracks are to be installed across the site to provide access for operation and maintenance works. These access tracks would be formed and surfaced with gravel.

Conceptual Surface Water Drainage Strategy

- 5.19 Some areas of the site are drained by existing underground drainage pipes, as shown on the historic drainage maps included as **Appendix C**. The condition of this drainage infrastructure is not currently known, or the exact location or depth below ground level.
- 5.20 Drainage holes will allow water to drain off each solar panel. The rain on each panel will runoff and drain into the sheltered rain shadow area underneath each panel, without any further need for mitigation or management measures. The site is currently covered in arable crops that will cease leaving a soiled ground and will only be marginally reduced as the solar panels are mounted onto frames.
- 5.21 Although drainage into the underlying substrate is anticipated to be limited across large parts of the site, the low impact of the solar panels on the surface water runoff regime will still enable a source control approach for the management of surface water drainage.
- 5.22 In terms of additional measures to accommodate surface water, **Figure 5.2** has been illustrated to show that swales adjacent to the site boundary, filter drains and a detention basin would be proposed at the site, with an explanation of each of these provided below.
- 5.23 The layout already includes a buffer strip adjacent to the security fence. This buffer strip provides an area for surface water management, as it would provide a natural filter strip. A swale would be located in sections of this buffer strip where ground levels are lowest and therefore adjacent to the western, north-eastern and parts of the southern site boundary.
- 5.24 A woodland belt is proposed adjacent to the southern site boundary and also a landscaped area in the eastern part of the site, with this including a detention basin. The swales adjacent to the north-eastern and southern boundary would connect to this detention basin.
- 5.25 There will be a very small proportion of impermeable surfaces within the site, such as within the substation compounds. It is proposed for a shallow trench to be located at the down-gradient side of these compounds and for this to be filled with gravel. Surface water runoff from impermeable surfaces will drain into the trenches, and then infiltrate into the ground.
- 5.26 The access tracks are to be formed and surfaced with gravel. This will avoid creating an impermeable surface from the access tracks. In addition, the access tracks will provide a

drainage solution for overland flows of water, which would have to pass through and therefore be slowed down by the gravel formation.

5.27 In order to further facilitate site wide management of surface water, a shallow trench could be placed on the down-gradient side of the access track with this fitted with a perforated pipe and filled with gravel to form a filter drain. The filter drain would therefore drain towards the southern site boundary and into the swale on the southern site boundary.

5.28 The proposed development of the site is also likely to have a number of additional benefits to the current surface water runoff regime. The absence of typical farming activities on the site is likely to help reduce the surface water runoff rates due to the following:

- The fields will no longer be ploughed or furrowed.
- The fields will no longer be left without vegetation cover in the winter periods.
- The fields will no longer be intensively trodden by heavy animals.
- The fields will no longer be regularly traversed by heavy machinery.

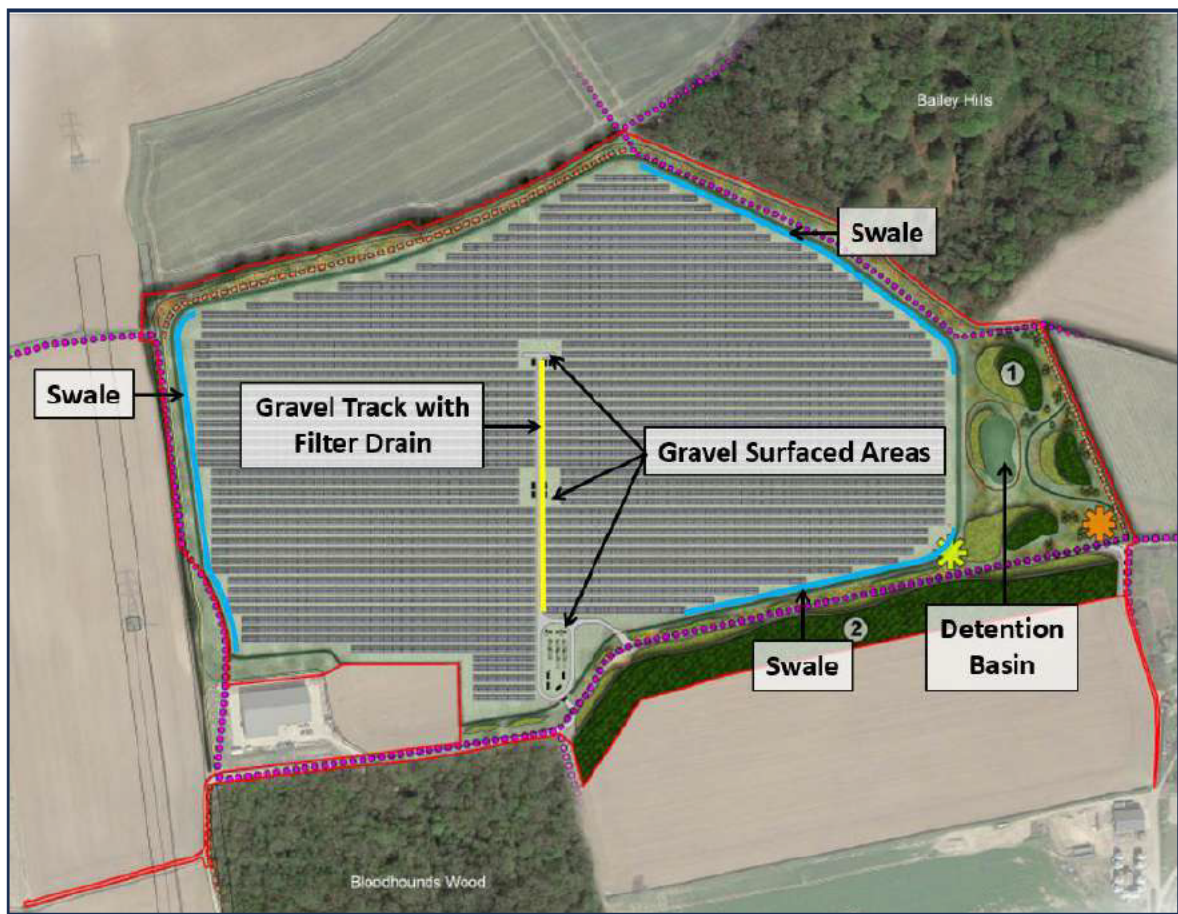


Figure 5.2: Conceptual Draining Strategy

Water Quality

- 5.29 Water quality has been considered in accordance with the CIRIA SuDS Manual (C753). This advises that a drainage scheme must demonstrate that the hazard index for the particular land use is less than the mitigation index of the proposed SuDS features.
- 5.30 The proposals for the majority of the site uses solar panels mounted onto a frame and which would not impact water quality. The proposed development would also include compounds and access tracks, which would be formed and surfaced using gravel.
- 5.31 The compounds and sections of access track adjacent to the site perimeter where ground levels are lowest would also have a shallow gravel filled trench located adjacent to them.
- 5.32 In addition, sections of swale would be located adjacent to the site perimeter where ground levels are lowest and also a detention basin is proposed in the eastern part of the site.
- 5.33 These swales and detention basin would help to capture and convey water associated with the control of a fire incident on the site. The drainage flow control from the site would be fitted with a penstock. If there is a fire incident, then this penstock would be closed to capture the contaminated firewater and associated materials and hold it on site, primarily in the detention basin.
- 5.34 This contaminated firewater would then be removed and disposed of at a later date using a tanker and with the detention basin and any other areas cleaned and reinstated.
- 5.35 The proposed SuDS features have been assessed, to see if they offer sufficient water quality mitigation for the proposed land use (informed by Chapter 26 of the CIRIA SuDS Manual).
- 5.36 If the pollution hazard from the access track and compounds were assessed as “Low Traffic Roads” and from the proposed land use as “Other Roofs”, they have the pollution indices as included in **Table 5.1**.
- 5.37 The total mitigation indices from the proposed SuDS features are also included in **Table 5.1**. This includes the gravel surfaced access tracks and compounds and the gravel filled trenches (filter drains). In addition, there are sections of swale and also a detention basin.
- 5.38 In accordance with the guidance in the CIRIA SuDS Manual, a factor of 0.5 has been applied to the pollution mitigation values typically associated with a swale and detention basin. This is required to account for the reduced performance of secondary or tertiary mitigation measures when associated with already reduced inflow concentrations.
- 5.39 For each of the assessed water quality parameters, the mitigation indices offered by the proposed SuDS features are higher than the pollution hazard indices from the proposed land use. This means that an adequate level of water quality mitigation would be provided.

	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Pollution Hazard Indices	0.80	0.60	0.45
SuDS Mitigation Indices	0.90	0.95	1.00

Table 5.1: Pollution Hazard Indices versus SuDS Mitigation Indices (SuDS Manual)

Operation and Maintenance

- 5.40 Operation and maintenance of these SuDS features would be undertaken in accordance with the recommendations as outlined in the SuDS Manual (C753).
- 5.41 The gravel access tracks and gravel filled trenches most closely match the description given for filter drains. The extract for the operation and maintenance of filter drains is provided in **Figure 5.3**, for swales as **Figure 5.4** and for the detention basin as **Figure 5.5**.
- 5.42 It is anticipated that these operation and maintenance measures would be completed by the site operator, as part of the routine operational requirements for running the site.
- 5.43 In addition, the general upkeep of the remainder of the site to include the control of the grass growth would be overseen by the site operator. Livestock (e.g. sheep) could be used to keep the length of grass around the solar panels to a reasonable level across the site.
- 5.44 This would also ensure that there is a suitable surface covering the ground and that is kept in an appropriate condition to help manage the intake of rain water and to reduce erosion.
- 5.45 It may be necessary for specific planting to be used if the grass does not persist, resulting in bare ground, perhaps using a type of grass suited to the particular conditions or matting.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (eg NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

Figure 5.3: Operation and Maintenance Requirements for Filter Drains (SuDS Manual)

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseeded	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

Figure 5.4: Operation and Maintenance Requirements for Swales (SuDS Manual)

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseedling or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

Figure 5.5: Operation and Maintenance Requirements for Detention Basins (SuDS Manual)

6.0 CONCLUSION

- 6.1 This FRA has been undertaken to support a forthcoming planning application for a solar farm development on land within the Wickham Hall Estate on the outskirts of Bishop's Stortford.
- 6.2 The LPA for this site area is UDC and the LLFA is ECC. The LPA for the adjacent area is EHDC and the LLFA is HCC.
- 6.3 Planning applications were previously submitted to UDC and EHDC for the construction and operation of solar farm with a combined output capacity of up to 49.9MW.
- 6.4 Following some negotiations and scheme amendments, the planning application for the part of the site within EHDC has been approved subject to conditions by EHDC.
- 6.5 The planning application for the part of the site within UDC was previously refused. However, in terms of the flood risk and drainage, ECC as the LLFA for the part of the site within UDC did not object to the proposed development subject to planning conditions.
- 6.6 This FRA has considered the local sources of flood risk and assessed the potential implications both to and resulting from the development proposals. It then considered the impact of the development proposals on the surface water runoff regime, and set out a conceptual strategy for these to be managed appropriately.
- 6.7 The site is located on a Secondary (undifferentiated) Aquifer for the superficial deposits. In terms of the Source Protection Zones, the site is within the Total Catchment, but outside of Source Protection Zones 1 and 2. The groundwater vulnerability is low in the western part of the site and medium-low in the eastern part. Local soils are described as clayey and some loamy, with these typically having slightly impeded drainage.
- 6.8 There are no watercourses located within the site. There is a drainage channel to the south known as Blackthorn Spring, which rises on the east side of Bloodhounds Wood, draining south to also adjoin the River Ash. These are also classified as Main Rivers.
- 6.9 There are some existing underground drainage pipes in the wider area, including in a part of the site. The condition of this drainage arrangement is not known, however it should be assumed that they currently help to drain the site. A ground investigation is suggested to inform the understanding of the drainage pipes, particularly their location and depth.
- 6.10 The proposed development is Essential Infrastructure and the site is wholly located within Flood Zone 1. The NPPF advises that this is an appropriate use of land. Therefore, the Sequential Test has been adequately demonstrated. An assessment of flood risk sources has concluded that these all represent a low risk for the majority of the site.
- 6.11 The Long Term Flood Map shows the majority of the site to be unaffected by surface water flooding. There are some surface water conveyance flow paths, but of limited extent. Information on the possible water depth and flow velocity shows that for the areas affected by the surface water flow paths, the water depth is typically low and the flow is fast.

- 6.12 Solar panels included in the areas affected by surface water flooding would need to consider the potential flood depth and flow velocity. The solar panels would be mounted at an angle on a frame, with the lower edge elevated above the ground. Other sensitive components of the solar panels would also be elevated.
- 6.13 The solar panels would be mounted on frames installed and anchored in accordance with a geotechnical investigation and therefore would withstand the flow velocity in the areas affected by surface water flooding. Consideration would be given to the potential presence of underground drainage, with care taken with the installation of the solar panel frames.
- 6.14 The location of the substation compounds has been informed by the surface water flow paths, and located to avoid an impact both from and to surface water flooding.
- 6.15 Given the design of the solar panels, it is anticipated that rain water falling on the panels will drain off the surface and then drain naturally into the ground, without any further need for mitigation or management measures. The site is currently covered in arable crops that will cease leaving a soiled ground and will only be marginally reduced as the solar panels are mounted onto frames.
- 6.16 A buffer strip adjacent to the security fence provides a natural filter strip for surface water management with a swale to be located in sections where ground levels are lowest and therefore adjacent to the western, north-eastern and parts of the southern site boundary.
- 6.17 A woodland belt is proposed adjacent to the southern site boundary and also a landscaped area in the eastern part of the site, with this including a detention basin. The swales adjacent to the north-eastern and southern boundary would connect to this detention basin.
- 6.18 A shallow gravel filled trench is proposed at the down-gradient side of the compounds. The access tracks are to be formed and surfaced with gravel and would avoid creating an impermeable surface and would also provide a drainage solution for overland flows.
- 6.19 A shallow gravel filled trench could also be placed on the down-gradient side of the access track. This would drain into the swale on the southern site boundary.
- 6.20 For each of the assessed water quality parameters, the mitigation indices offered by the proposed SuDS features are higher than the pollution hazard indices from the proposed land use. This means that an adequate level of water quality mitigation would be provided. The flow control will be fitted with a penstock and will be closed if there is a fire to capture the contaminated firewater and associated materials and hold it on site, primarily in the detention basin. This water would then be removed and disposed of at a later date using a tanker and with the detention basin and any other areas cleaned and reinstated.
- 6.21 Operation and maintenance of these SuDS features would be undertaken in accordance with the recommendations as outlined in the SuDS Manual (C753). This would be completed by the site operator, as part of the routine requirements for running the site.
- 6.22 This FRA has concluded that with incorporation of the suggested mitigation and management measures, that the proposed development of the site is considered to be appropriate in terms

of flood risk and drainage.

Appendix A Consultation with LLFA

Essex County Council
**Development and Flood Risk
Environment and Climate Action,**
C426 County Hall
Chelmsford
Essex CM1 1QH



██████████
Uttlesford District Council
Planning Services

Date: 10th Mar 2022
Our Ref: SUDS-005679
Your Ref: UTT/21/3108/FUL

Dear ██████████,

Consultation Response – UTT/21/3108/FUL– Land North-West of Bishops Stortford Farnham Road

Thank you for your email received on 2/12/2021 which provides this Council with the opportunity to assess and advise on the proposed surface water drainage strategy for the above mentioned planning application.

As the Lead Local Flood Authority (LLFA) this Council provides advice on SuDS schemes for major developments. We have been statutory consultee on surface water since the 15th April 2015.

In providing advice this Council looks to ensure sustainable drainage proposals comply with the required standards as set out in the following documents:

- Non-statutory technical standards for sustainable drainage systems
- Essex County Council's (ECC's) adopted Sustainable Drainage Systems Design Guide
- The CIRIA SuDS Manual (C753)
- BS8582 Code of practice for surface water management for development sites.

Lead Local Flood Authority position

Having reviewed the Flood Risk Assessment and the associated documents which accompanied the planning application, we **do not object** to the granting of planning permission subject to the following:

Condition 1

No works until a detailed surface water drainage scheme for the site, based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the development, has been submitted to and approved in writing by the local planning authority. The scheme should include but not be limited to:

- Provide verification of the suitability of infiltration of surface water for the development. This should be based on infiltration tests that have been undertaken in accordance with BRE 365 testing procedure and the infiltration testing methods found in chapter 25.3 of The CIRIA SuDS Manual C753.

- Incorporate bunds to help slow and interrupt the surface water flows.
- Provide an enforceable and robust soil, grass, and/or land management plan to keep land in good condition. If the ground becomes bare due to lack of maintenance the peak discharge has the potential to increase significantly.
- Provide the appropriate level of treatment for all runoff leaving the site, in line with the Simple Index Approach in chapter 26 of the CIRIA SuDS Manual C753.
- Provide a drainage plan which details exceedance and conveyance routes, FFL levels of sub stations, levels of battery units, and ground levels.
- Provide an updated written report summarising the final strategy and highlighting any minor changes to the approved strategy.

Condition 2

No works shall take place until a scheme to minimise the risk of offsite flooding caused by surface water run-off and groundwater during construction works and prevent pollution has been submitted to, and approved in writing by, the local planning authority. The scheme shall subsequently be implemented as approved.

Reason

The National Planning Policy Framework paragraph 167 and paragraph 174 state that local planning authorities should ensure development does not increase flood risk elsewhere and does not contribute to water pollution.

Construction may lead to excess water being discharged from the site. If dewatering takes place to allow for construction to take place below groundwater level, this will cause additional water to be discharged. Furthermore the removal of topsoils during construction may limit the ability of the site to intercept rainfall and may lead to increased runoff rates. To mitigate increased flood risk to the surrounding area during construction there needs to be satisfactory storage of/disposal of surface water and groundwater which needs to be agreed before commencement of the development.

Construction may also lead to polluted water being allowed to leave the site. Methods for preventing or mitigating this should be proposed.

Condition 3

Prior to start of construction a maintenance plan detailing the maintenance arrangements including who is responsible for different elements of the surface water drainage system and the maintenance activities/frequencies, has been submitted to and agreed, in writing, by the Local Planning Authority.

Should any part be maintainable by a maintenance company, details of long term funding arrangements should be provided.

Reason

To ensure appropriate maintenance arrangements are put in place to enable the surface water drainage system to function as intended to ensure mitigation against flood risk and soil erosion.

Failure to provide the above required information prior to occupation may result in the installation of a system that is not properly maintained and may increase flood risk, soil erosion or pollution hazard from the site.

Condition 4

The applicant or any successor in title must maintain yearly logs of maintenance which should be carried out in accordance with any approved Maintenance Plan. These must be available for inspection upon a request by the Local Planning Authority.

Reason

To ensure the SuDS are maintained for the lifetime of the development as outlined in any approved Maintenance Plan so that they continue to function as intended to ensure mitigation against flood risk.

We also have the following advisory comments:

- We strongly recommend looking at the Essex Green Infrastructure Strategy to ensure that the proposals are implementing multifunctional green/blue features effectively. The link can be found below.
<https://www.essex.gov.uk/protecting-environment>

The proposed development will only meet the requirements of the National Planning Policy Framework if the measures as detailed in the FRA and the documents submitted with this application are implemented as agreed.

Any questions raised within this response should be directed to the applicant and the response should be provided to the LLFA for further consideration. If you are minded to approve the application contrary to this advice, we request that you contact us to allow further discussion and/or representations from us.

Summary of Flood Risk Responsibilities for your Council

We have not considered the following issues as part of this planning application as they are not within our direct remit; nevertheless these are all very important considerations for managing flood risk for this development, and determining the safety and acceptability of the proposal. Prior to deciding this application you should give due consideration to the issue(s) below. It may be that you need to consult relevant experts outside your planning team.

- Sequential Test in relation to fluvial flood risk;
- Safety of people (including the provision and adequacy of an emergency plan, temporary refuge and rescue or evacuation arrangements);
- Safety of the building;
- Flood recovery measures (including flood proofing and other building level resistance and resilience measures);

- Sustainability of the development.

In all circumstances where warning and emergency response is fundamental to managing flood risk, we advise local planning authorities to formally consider the emergency planning and rescue implications of new development in making their decisions.

Please see Appendix 1 at the end of this letter with more information on the flood risk responsibilities for your council.

INFORMATIVES:

- Essex County Council has a duty to maintain a register and record of assets which have a significant impact on the risk of flooding. In order to capture proposed SuDS which may form part of the future register, a copy of the SuDS assets in a GIS layer should be sent to suds@essex.gov.uk.
- Any drainage features proposed for adoption by Essex County Council should be consulted on with the relevant Highways Development Management Office.
- Changes to existing water courses may require separate consent under the Land Drainage Act before works take place. More information about consenting can be found in the attached standing advice note.
- It is the applicant's responsibility to check that they are complying with common law if the drainage scheme proposes to discharge into an off-site ditch/pipe. The applicant should seek consent where appropriate from other downstream riparian landowners.
- The Ministerial Statement made on 18th December 2014 (ref. HCWS161) states that the final decision regarding the viability and reasonableness of maintenance requirements lies with the LPA. It is not within the scope of the LLFA to comment on the overall viability of a scheme as the decision is based on a range of issues which are outside of this authority's area of expertise.
- We will advise on the acceptability of surface water and the information submitted on all planning applications submitted after the 15th of April 2015 based on the key documents listed within this letter. This includes applications which have been previously submitted as part of an earlier stage of the planning process and granted planning permission based on historic requirements. The Local Planning Authority should use the information submitted within this response in conjunction with any other relevant information submitted as part of this application or as part of preceding applications to make a balanced decision based on the available information.

Yours sincerely,

██████████ Development and Flood Risk Officer
Team: Green Infrastructure and Sustainable Drainage
Service: Climate Action and Mitigation
Essex County Council

Internet: www.essex.gov.uk
Email: suds@essex.gov.uk

Appendix 1 - Flood Risk responsibilities for your Council

The following paragraphs provide guidance to assist you in determining matters which are your responsibility to consider.

- Safety of People (including the provision and adequacy of an emergency plan, temporary refuge and rescue or evacuation arrangements)

You need to be satisfied that the proposed procedures will ensure the safety of future occupants of the development. In all circumstances where warning and emergency response is fundamental to managing flood risk, we advise LPAs formally consider the emergency planning and rescue implications of new development in making their decisions.

We do not normally comment on or approve the adequacy of flood emergency response procedures accompanying development proposals as we do not carry out these roles during a flood.

- Flood recovery measures (including flood proofing and other building level resistance and resilience measures)

We recommend that consideration is given to the use of flood proofing measures to reduce the impact of flooding when it occurs. Both flood resilience and resistance measures can be used for flood proofing.

Flood resilient buildings are designed to reduce the consequences of flooding and speed up recovery from the effects of flooding; flood resistant construction can help prevent or minimise the amount of water entering a building. The National Planning Policy Framework confirms that resilient construction is favoured as it can be achieved more consistently and is less likely to encourage occupants to remain in buildings that could be at risk of rapid inundation.

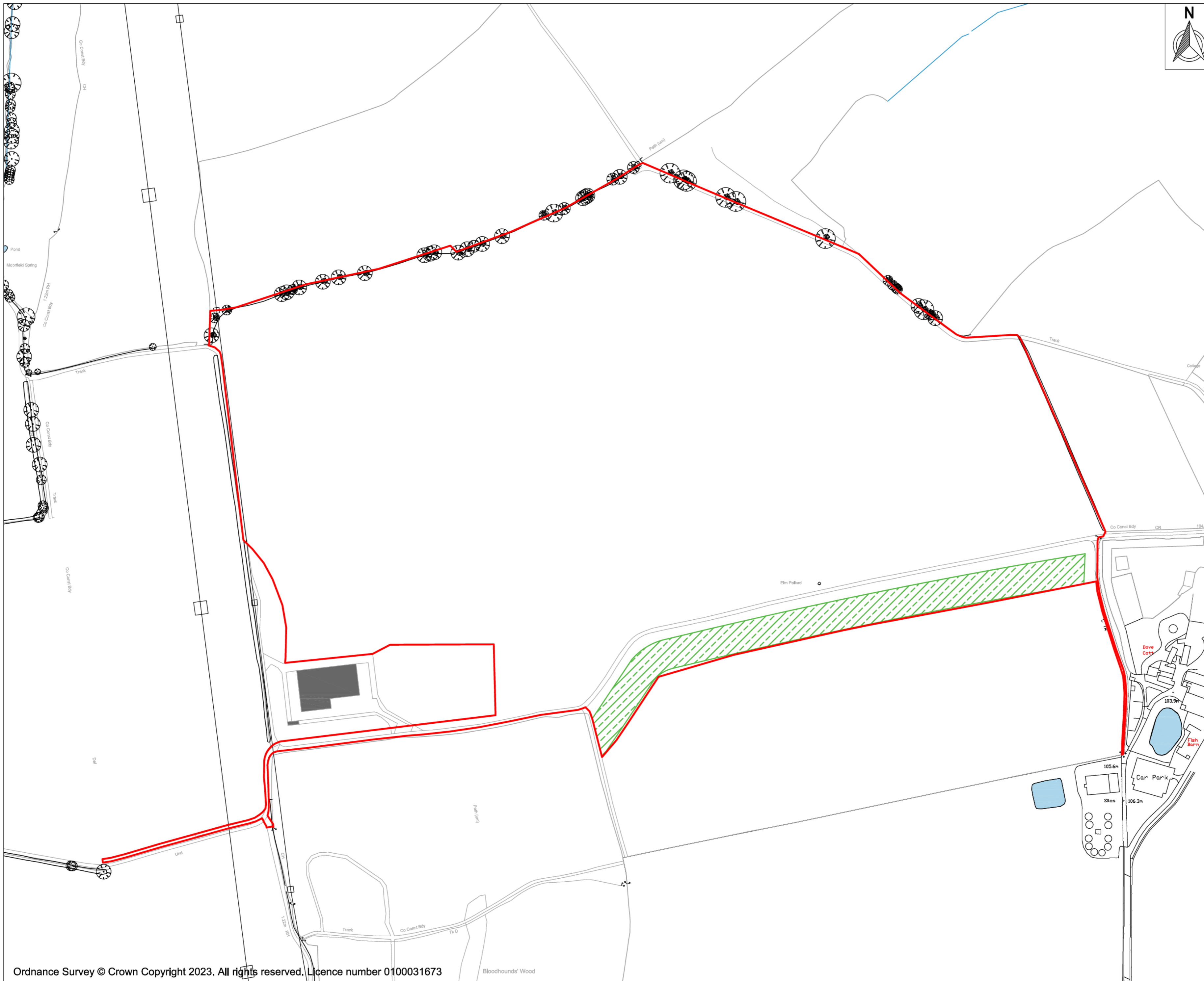
Flood proofing measures include barriers on ground floor doors, windows and access points and bringing in electrical services into the building at a high level so that plugs are located above possible flood levels. Consultation with your building control department is recommended when determining if flood proofing measures are effective.

Further information can be found in the Department for Communities and Local Government publications '[Preparing for Floods](#)' and '[Improving the flood performance of new buildings](#)'.

- Sustainability of the development

The purpose of the planning system is to contribute to the achievement of sustainable development. The NPPF recognises the key role that the planning system plays in helping to mitigate and adapt to the impacts of climate change, taking full account of flood risk and coastal change; this includes minimising vulnerability and providing resilience to these impacts. In making your decision on this planning application we advise you consider the sustainability of the development over its lifetime.

Appendix B Proposed Development



- Application Site
- Proposed Woodland
- Existing Trees

Revisions

A	01.06.2023	Red Line amendment
B	13.06.2023	Red Line amendment
C	04.10.2023	Red Line amendment
D	15.10.2024	Red Line amendment for Landscape Buffer
E	06.03.2024	Red Line amendment for Landscape Buffer
F	20.03.2024	Red Line amendment
G	11.04.2024	Landscaping Added
H	14.05.2024	Red Line Amendment
I	24.05.2024	Landscaping Amended

Scale 1:2500



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CLIENT
Endurance Energy Wickham Hall Limited

PROJECT
**Wickham Hall Estate
 Bishops Stortford**

DRAWING TITLE
Location Plan

Date	24 May 2024	OS Ref	546812, 222970	Drawn By	PMG
Scale	1:2500 @ A2	Drawing No.	D01	Checked By	SP
Job No.	H5234-6	Rev	I		

NATIVE HEDGEROW PLANTING

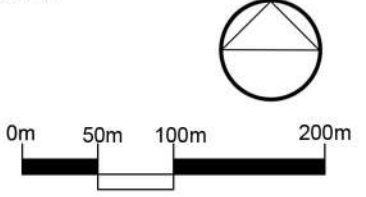


NATIVE WOODLAND PLANTING



INTERPRETATION BOARD

NOTES:
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Licence 100040345
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Key:

- Site Boundary
- Existing Public Right Of Way
- Permissive Footpath
- Informal Path
- Proposed Woodland Planting
- Hedge lined Green Corridor along Fenceline
- Proposed Scrub Planting
- Proposed Tree Planting
- Existing Hedgerow
- Existing Woodland Planting
- Proposed Species Rich Wildflower Mix
- Development Window with Interpretation Solar Boards
- Interpretation Board for Wildlife Area

- 1** Wildlife area with informal public access where new habitats have been created for a wide variety of species.
- 2** Proposed woodland belt (30m wide)

REV	DATE	NOTE	SB	AJ	CHK'D
N	24.05.24	Updated to latest comments	SB	AJ	
M	15.05.24	Updated to latest redline boundary	BS	AJ	
L	01.05.24	Updated to latest layout	AS	AJ	
K	20.03.24	Updated to latest comments	BS	AJ	
J	22.03.24	Updated to latest layout	BS	AJ	
I	22.02.24	Updated to latest layout	BS	AJ	
H	21.12.23	Updated client name	AS	JC	
G	20.08.23	Updated to latest comments	BS	JC	
F	07.08.23	Updated to latest layout	BS	JC	
E	23.05.23	Updated to latest comments	BS	JC	
D	10.05.23	Updated to latest layout	BS	JC	
C	20.04.23	Updated to latest comments	BS	JC	
B	28.03.23	Updated to latest comments	BS	JC	
A	16.03.23	Updated to latest comments	BS	JC	



WILDLIFE AND WILDFLOWER PLANTING

aspect landscape planning

TITLE
Wickham Hall Solar Farm, Uttlesford
Landscape Masterplan

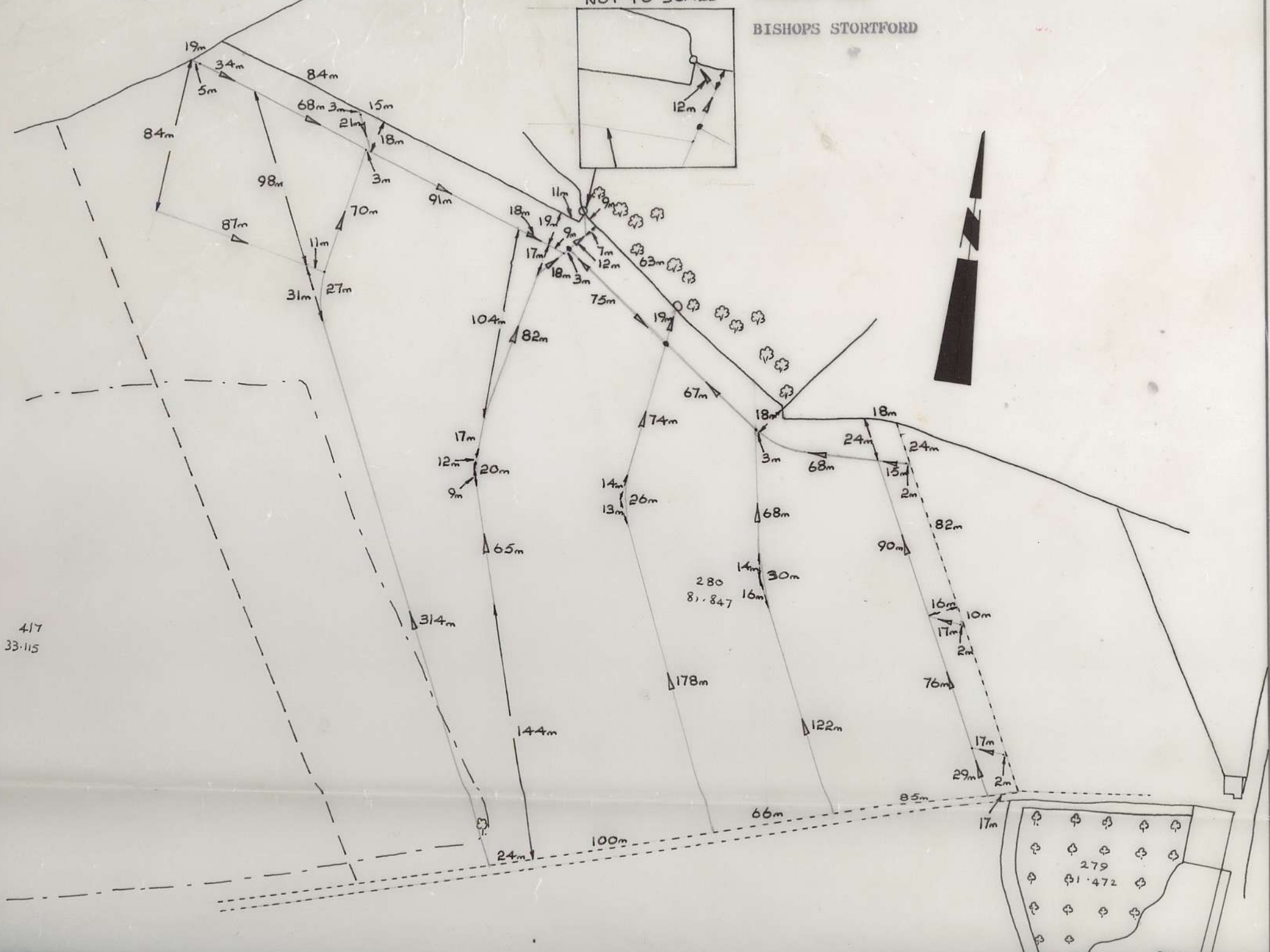
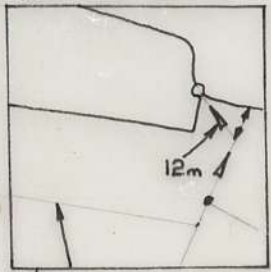
CLIENT
Endurance Energy Wickham Hall Ltd

SCALE 1:5000@A3	DATE AUG 2022	DRAWN SB	CHK'D JC
DRAWING NUMBER 7200 / ASP3 / LMP		REVISION N	

Appendix C Historic Drainage Maps

NOT TO SCALE

WICKHAM HALL
BISHOPS STORTFORD



417
33-115

280
81.847

279
1.472



BEDFORD

Planning / SDD / SPRU

bedford@dlpconsultants.co.uk

BRISTOL

Planning / SDD / SPRU

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Planning/ SDD

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LIVERPOOL

Planning

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LONDON

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