Flood Risk & Drainage Assessment

Postcombe and Lewknor Solar Farm, Hatfield, Oxfordshire, OX49 5SQ

07 April 2025

Postcombe and Lewknor Solar Farm Limited

ASHFIELD
SOLUTIONS GROUP

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Contents

Annexes

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Executive Summary

Ashfield Flood Risk Solutions ("Ashfield") were commissioned by ITP Energised (now part of SLR Consulting) on behalf of Postcombe and Lewknor Solar Farm Limited ("the Applicant") to undertake a Flood Risk & Drainage Assessment
("FRDA"), in support of a planning application at Postcombe and Lewknor Solar Farm, Hatfield, Oxfordshire, OX49 5SQ ("the site"). The proposed development at the site comprises the erection of PV solar panels and associated infrastructure, access track and underground cable. This report will focus on the proposed location of the PV solar panels and associated infrastructure. The assessment will not consider the cable corridor as this is only a temporary disruption and is not expected to cause any interference to flood risks. The Environment Agency's (EA) Flood Map for Planning (Rivers and Sea) (FMFP) indicates that the site is located within Flood Zone 1 (<0.1% AEP). Based on the EA's flood maps and there being no recorded historic fluvial or tidal flooding near the site, the risk of flooding from fluvial sources is considered Low, with tidal risk considered Negligible.

The EA Risk of Flooding from Surface Water (RoFSW) extent mapping indicates that at the present-day and future Climate Change scenarios, the majority of Areas 1 and 2 are not identified to be at risk of surface water flooding. This means that each year, the site has less than 1 in 1000 (0.1%) chance of flooding from surface water. Area 1 shows small, isolated areas of High, Medium and Low probability on site, with these areas identified to be slight topographic depressions. An isolated area of High, Medium and Low probability is protected within the south-east region of Area 2. The RoFSW depth mapping shows the projected depths to be less than 0.2m within Areas 1 and 2 at both the present-day and future Climate Change scenarios. These isolated areas are not considered to be significant in terms of potential risk to the proposed development at the site. Any substation/similar infrastructure will be located outside of the High, Medium and Low probability extents. Surface water on the whole is considered to pose a Low risk.

All other sources of flooding (groundwater, reservoir failure and artificial sources) are also considered to pose a Low or Negligible risk at the site.

The development is located in Flood Zone 1 and is therefore deemed acceptable in accordance with the National Planning Policy Framework. As seen within Table 3 of the Government Guidance on Flood Risk and Coastal Change, all developments located within Flood Zone 1 are deemed appropriate in a flood risk context.

An illustrative surface water drainage strategy has been produced for the proposed development which shows that the site can accommodate surface water attenuation for events, up to and including, the 1 in 100 year storm +40% allowance for Climate Change. This is based on utilising swales with an overall length of approximately 1305m along the eastern extent of Area 1 and the southern/western extent of Area 2. The overall capacity of the swales amounts to approximately 196m^3. On this basis, the proposed development would not increase flood risk onsite or elsewhere and would preserve the application site's natural drainage regime.

This report therefore demonstrates that the proposed development:

- Is suitable in the location proposed;
- Is unlikely to place additional persons at risk of flooding;
- Is unlikely to increase flood risk elsewhere as a result of the proposed development through the loss of floodplain storage, impedance of flood flows or increase in surface water runoff; and,
- Demonstrates compliance with national and local policies.

1 Introduction

1.1 Authorisation and Context

Ashfield Flood Risk Solutions ("Ashfield") were commissioned by ITP Energised (now part of SLR Consulting) on behalf of Postcombe and Lewknor Solar Farm Limited ("the Applicant") to undertake a Flood Risk & Drainage Assessment ("FRDA"), at Postcombe and Lewknor Solar Farm, Oxfordshire, OX49 5SQ ("the site"). The main solar site location can be seen on Figure 1 for reference. This report has been prepared in support of a planning application at the site, which is discussed further in Section 1.6.

1.2 Aims and Objectives

This report will look to assess flooding from all potential sources, with the aim to address the requirements of the National Planning Policy Framework (NPPF), the Non-Statutory Technical Standards for Sustainable Drainage Systems and Local Standards and Guidance for Surface Water Drainage on Major Developments in Oxfordshire Document:

- Assessing whether the site is likely to be affected by flooding from different sources;
- Providing an assessment of the vulnerability of the proposed development and its suitability in relation to the identified flood risks; and,
- Providing an opinion in relation to the likely impacts of the proposed development on flooding elsewhere.

1.3 Information Sources Used

In order to prepare this FRDA, the following information sources and general guidance documents have been used:

- National Planning Policy Framework (NPPF) – Ministry of Housing, Communities & Local Government, December 2024;
- Flood Risk and Coastal Change Planning Practice – Ministry of Housing, Communities & Local Government, August 2022;
- Non-Statutory Technical Standards for Sustainable Drainage Systems – DEFRA, March 2015;
- Local Standards and Guidance for Surface Water Drainage on Major Developments in Oxfordshire Document – Oxfordshire County Council, December 2021;
- Development & Flood Risk Guidance for the Construction Industry (CIRIA C624) – ARUP, 2004;
- Planning Boundary (ref: 113-031E-250401) – Solar2, April 2025;
- Proposed Site Plan (ref: 113-038A-250401) – Solar2, April 2025;
- South Oxfordshire District Council Strategic Flood Risk Assessment (SFRA) – JBA Consulting, March 2019;
- Oxfordshire County Council Preliminary Flood Risk Assessment (PFRA) – JBA Consulting, June 2011;
- Oxfordshire County Council Local Flood Risk Management Strategy (LFRMS) - Oxfordshire County Council, Date N/A;
- 1m resolution LiDAR data – downloaded online April 2025;
- Environment Agency interactive flood maps – accessed online April 2025; and,
- British Geological Survey (BGS) Drift & Geology Maps - accessed online April 2025.

1.4 Report Limitations

This assessment of flood risk has looked to use the most accurate and up to date flood mapping for the location. The solar site boundary has been supplied by the client and the assessment of risk is based on this. This report has been prepared with due care and diligence in accordance with industry best practice and guidance. The conclusions in this report are valid only to the extent that the information provided to Ashfield was accurate and complete at time of receipt.

1.5 Site Setting

The site is located at coordinates XY: 470897,198749 (nearest post code: OX49 5SQ), situated to the north of the village of Lewknor, occupying an overall area of approximately 87 hectares (ha) excluding the cable corridor. The site is split into two areas, with Area 1 located to the east of the M40, and Area 2 located to the west. The site currently comprises three agricultural fields, with Area 1 accessed via London Road to the east and Area 2 accessed via Salt Lane to the north.

Area 1 is bound by Salt Lane and residential dwellings to the north and arable and grassland fields to the east, south and west.

Area 2 is bound to the north by Salt Lane, to the east by the M40, to the south by Nethercote Lane and to the west by a residential dwelling and arable and grassland fields.

1.6 Development Proposals

The proposed development at the site comprises the erection of PV solar panels and associated infrastructure, access track and underground cable. As previously mentioned, this report will focus on the proposed location of the PV solar panels and associated infrastructure only. The assessment will not consider the cable corridor as this is only a temporary disruption and is not expected to cause any interference to flood risks. From a review of the proposed site plan, which is attached as Annex B for reference, the solar panels will comprise an area of 27ha in Area 1 and 31ha in Area 2.

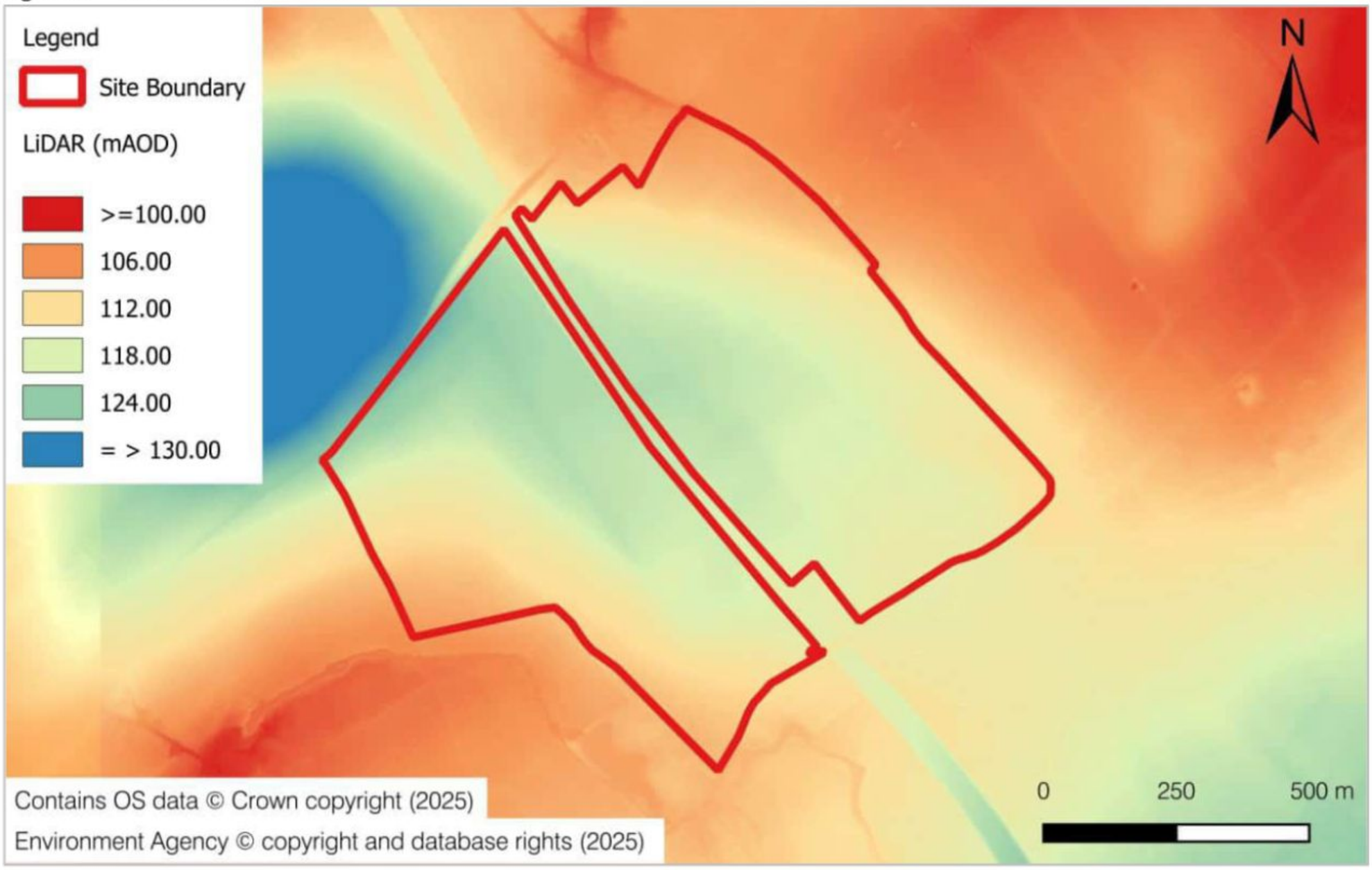
1.7 Topographic Mapping

In absence of a site-specific topographical survey, freely available 1m resolution Light Detection and Ranging (LiDAR) data has been downloaded for the site and local area. A visual illustration of the LiDAR is presented in Figure 2.

From review of the LiDAR, the ground levels within Area 1 are shown to generally be higher in the centre of the site with a level of approximately 119.26mAOD. The ground levels then slope down towards the south slightly to 115.97mAOD, with levels also falling to the north down towards approximately 108.01mAOD.

The ground levels within Area 2 are shown to be highest in the north with a level of approximately 127.2mAOD, sloping down towards the southern region of the site where the lowest ground level is approximately 112.2mAOD.

Figure 2 – LiDAR Derived Ground Levels

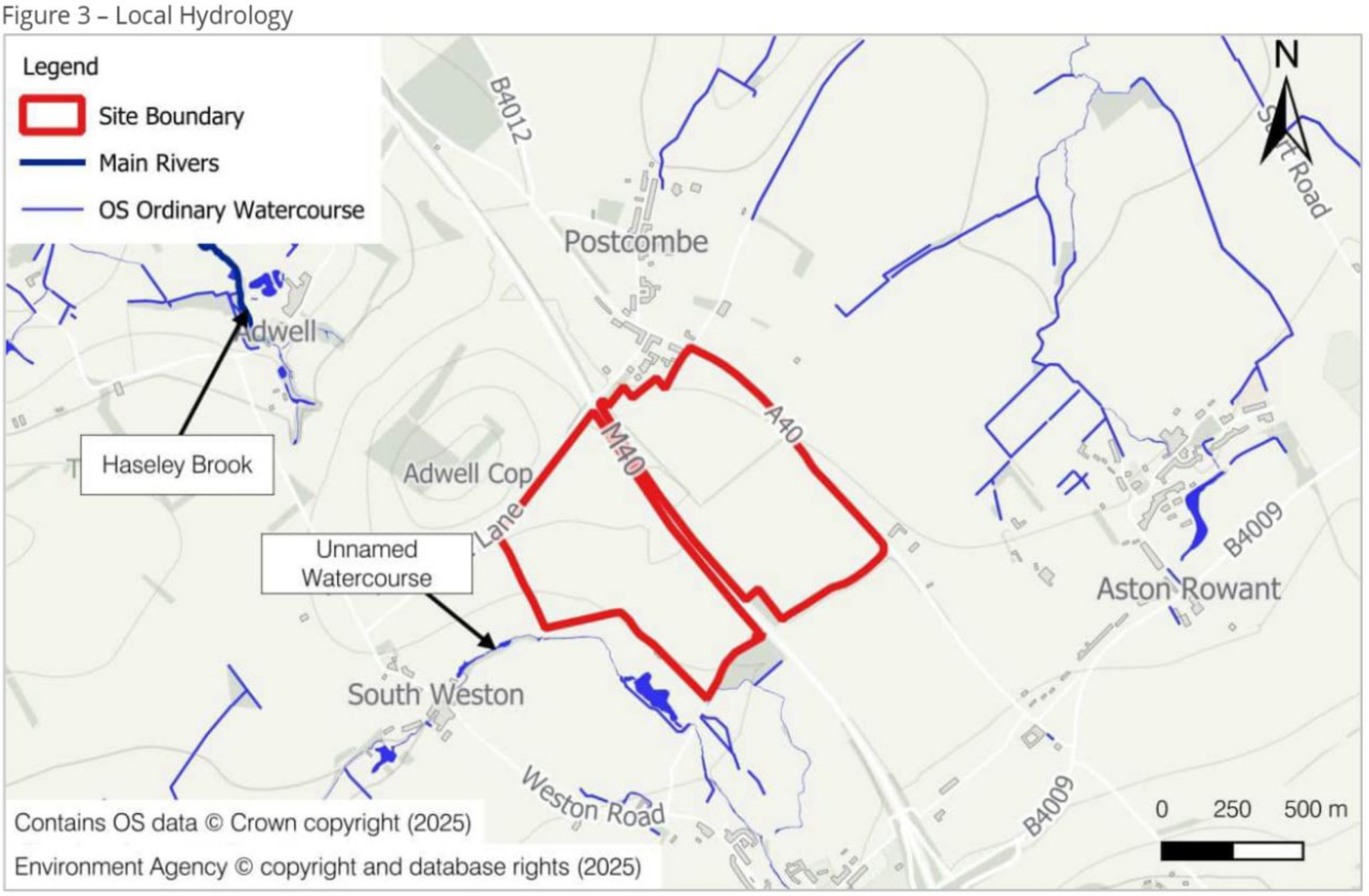


1.8 Local Hydrology

The nearest Environment Agency (EA) designated Main River to the site is the Haseley Brook, located approximately 1.2km to the west, flowing in a north-westerly direction.

The nearest ordinary watercourse to the site is unnamed and is located approximately 10m to the south of Area 2, flowing in a north-westerly direction. The Haseley Brook and unnamed ordinary watercourse are illustrated in Figure 3 for reference.

Figure 3 – Local Hydrology



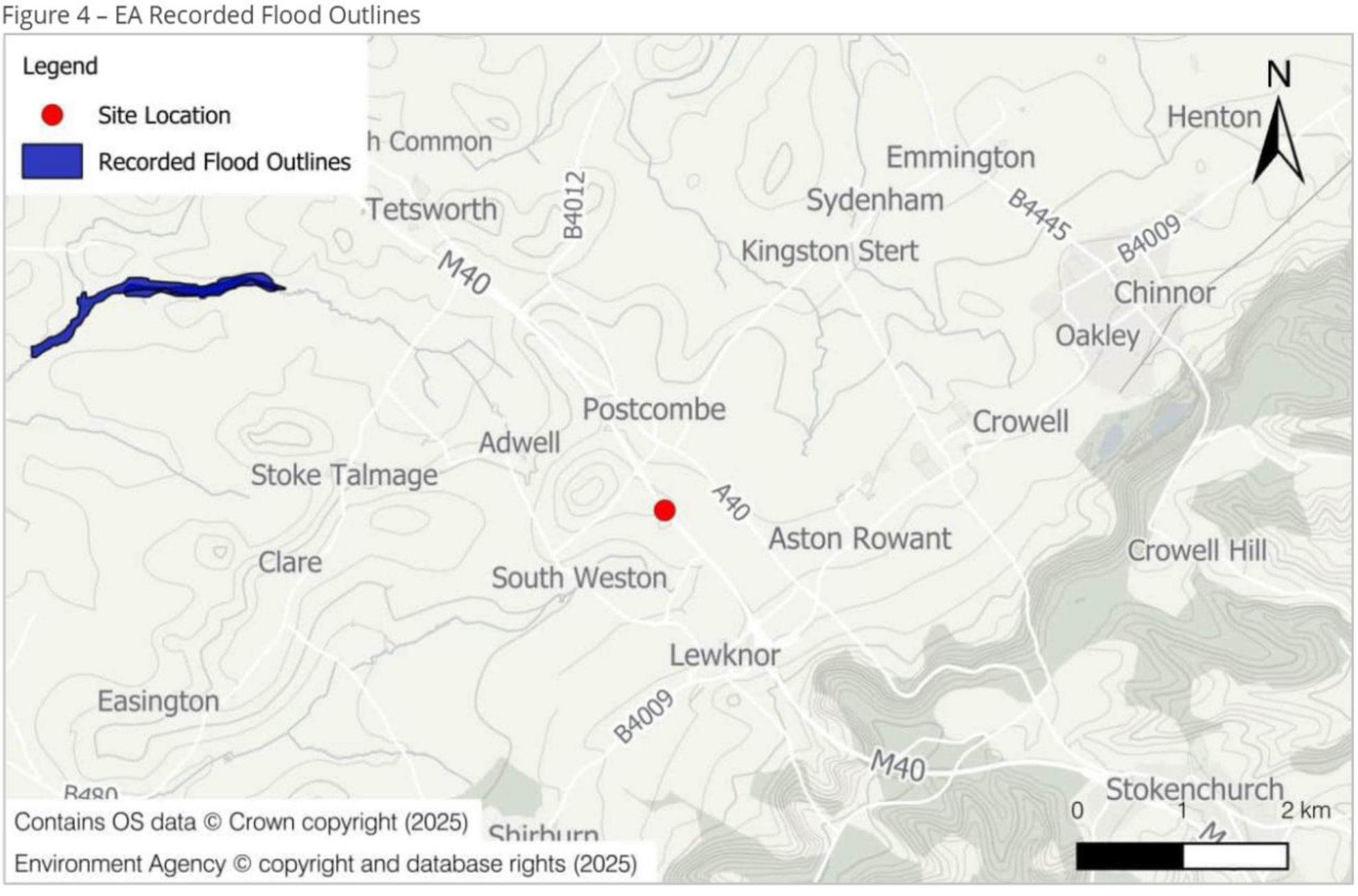
1.9 Local Drainage

No formal drainage plans have been provided by the client to help inform this report. As the site currently comprises existing arable and grassland fields, it is assumed that there are no positive drainage connections from the site.

1.10 Flood History

The EA recorded flood outlines open-source GIS dataset is a compilation of historical flood events that have occurred across England over the past century. Figure 4 shows that the site is shown to be located outside of an area that has historically flooded, with the nearest extent located approximately 3.7km to the north-west. This event occurred on the 6th October 1993, when the channel capacity of the Haseley Brook exceeded its banks due to no raised flood defences.

Figure 4 – EA Recorded Flood Outlines



2 Flood Risk Evaluation

The following sections provide an evaluation of the risk posed by the key flood sources in relation to the site location. Consideration is given to the severity of flood risk to the site as a whole, making use of existing flood mapping, high-level local strategic studies and available topographic information.

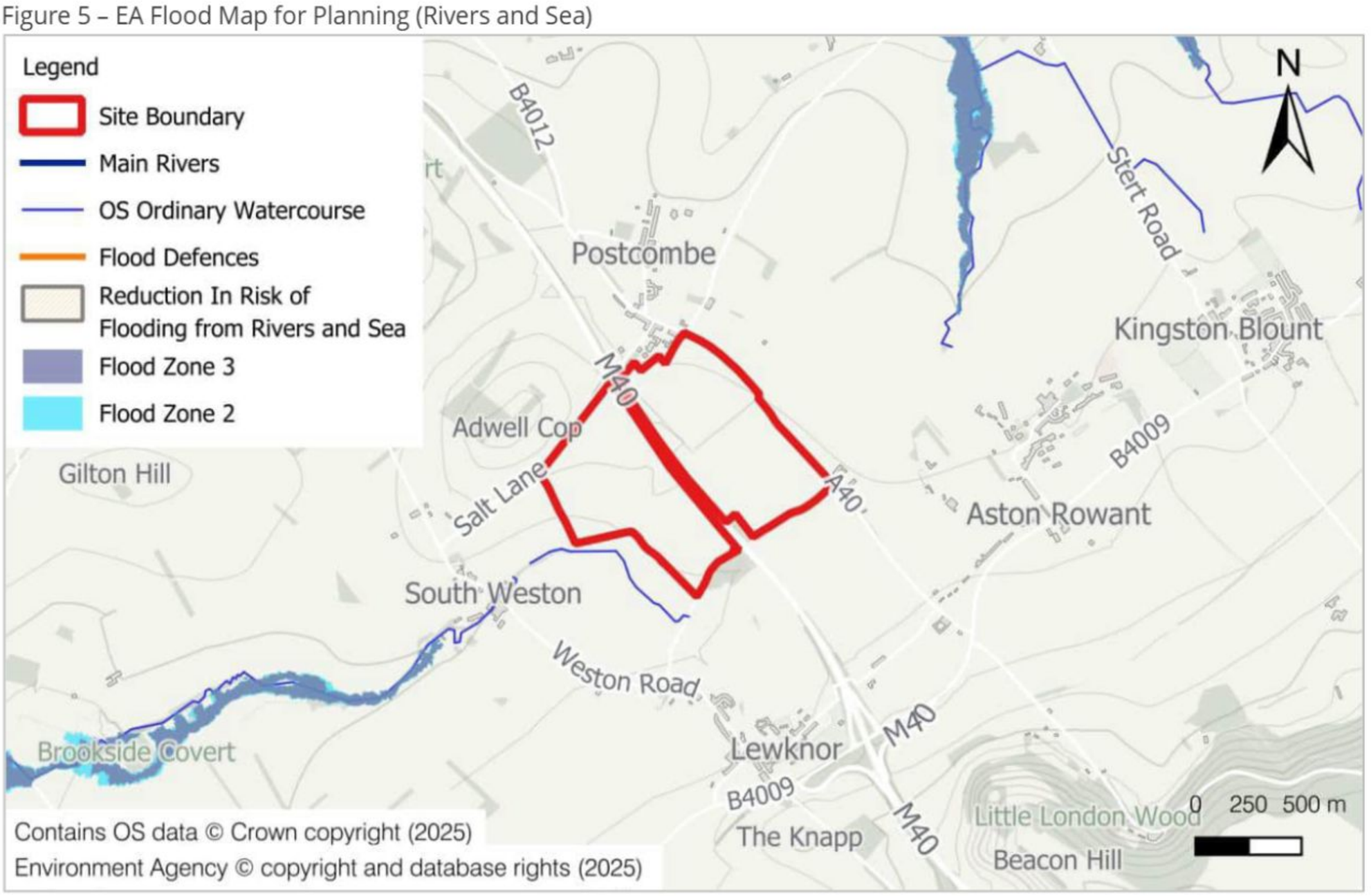
2.1 Fluvial Flood Risk

Fluvial flood risk originates from a watercourse of any size that may affect a site when the channel capacity is exceeded. This type of flooding often occurs following an extreme rainstorm event or a prolonged period of wet weather.

2.1.1 EA Flood Mapping

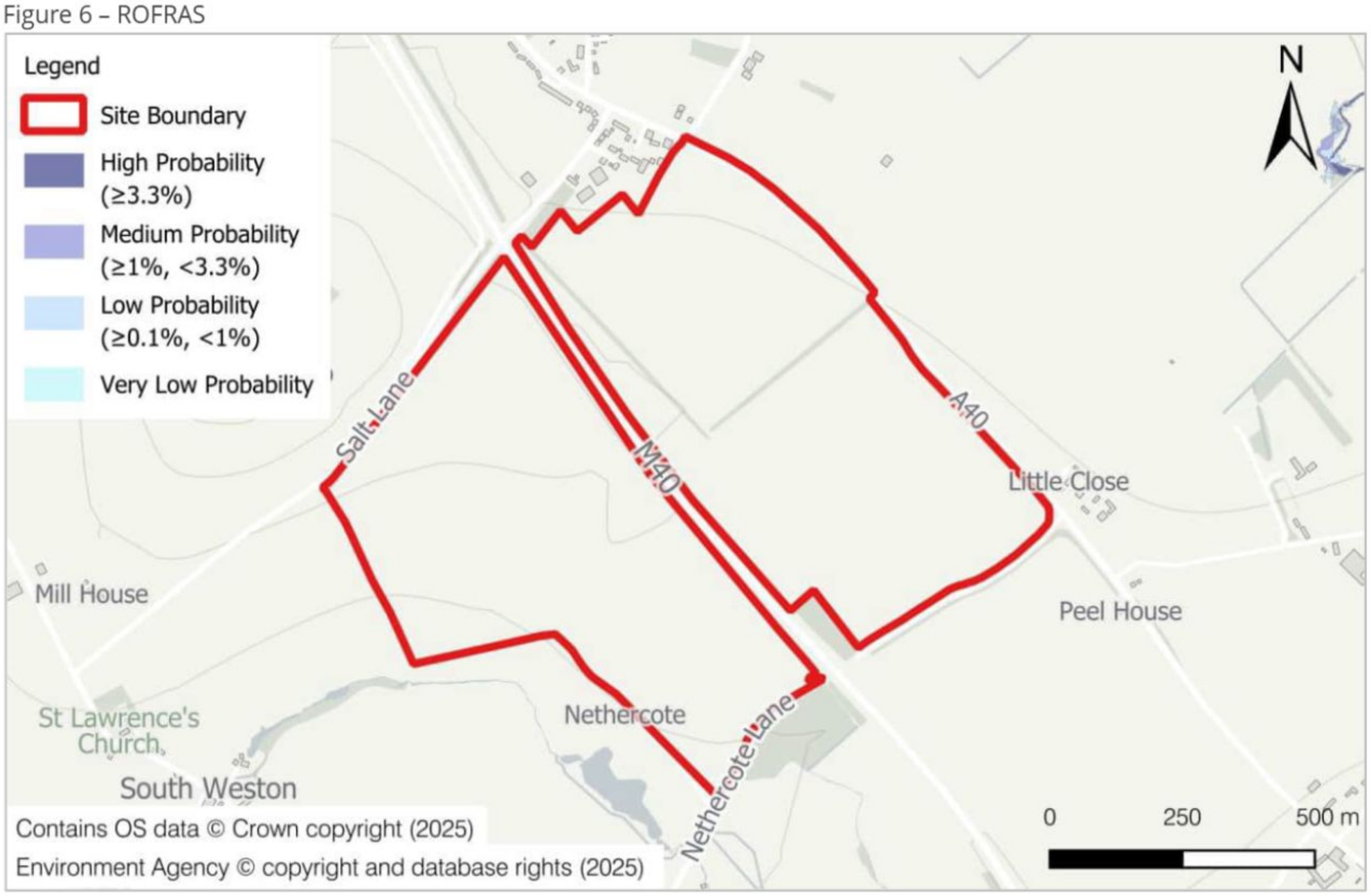
The Environment Agency's Flood Map for Planning (Rivers and Sea) divides the floodplain into risk-based categories and provides an indication of flood risk for the site. The EA Flood Map for Planning (Rivers and Sea) (Figure 5) indicates that the site is located within Flood Zone 1. Flood Zone 1 is defined as land assessed as having less than 0.1% annual probability of river flooding. The Flood Zones show the 'undefended' scenario, where any flood defences in the locality are not represented within the mapping.

Figure 5 – EA Flood Map for Planning (Rivers and Sea)



The Risk of Flooding from Rivers and Sea (ROFRAS) mapping (Figure 6) indicates that the site is located outside of all four ROFRAS extents. This mapping takes into account the representation of any flood defences that may exist in the local area.

Figure 6 – ROFRAS



2.1.2 Flood Defences

The nearest flood defences to the site are located approximately 1km to the west, along the eastern bank of the Haseley Brook. From interrogation of the open-source layer for flood defences in a GIS viewer, this is identified to comprise natural high ground, with the design standard of protection (SOP) up to a 1 in 2 year event (50%). These are not considered to have any benefit to the site location.

No other flood defences have been identified within the wider area in which the site is located within.

> In summary, the overall risk to the site from fluvial flooding is **Low**. No further consideration is deemed necessary as part of this FRA.

2.2 Tidal Flood Risk

Tidal flood risk can affect the coastline as well as estuaries and rivers that are tidally influenced. Flood events often coincide with the tidal regime, high rainfall events or other natural phenomena, which can lead to water levels covering low-lying land or exceeding natural or man-made defences.

The site is located approximately 52km north-west of the nearest tidally influenced area (Teddington tidal lock), and furthermore, has a ground elevation in the region of approximately >112m.

> The overall risk of tidal flooding affecting the site is **Negligible**. No further consideration is deemed necessary as part of this FRDA.

2.3 Surface Water Flooding

Surface water flooding occurs when local drainage networks are overwhelmed during an extreme rainfall event, causing water to flow over the surface and follow gravity to the lowest point where it often pools. This flood source is increasingly becoming one of the major contributors of flood risk, due to changing weather patterns and increased extreme rainfall events occurring across the UK. This places more pressure than ever on drainage systems, which are often overwhelmed during flash flood events, normally only designed to take between a 1 in 20 and a 1 in 30 return period event.

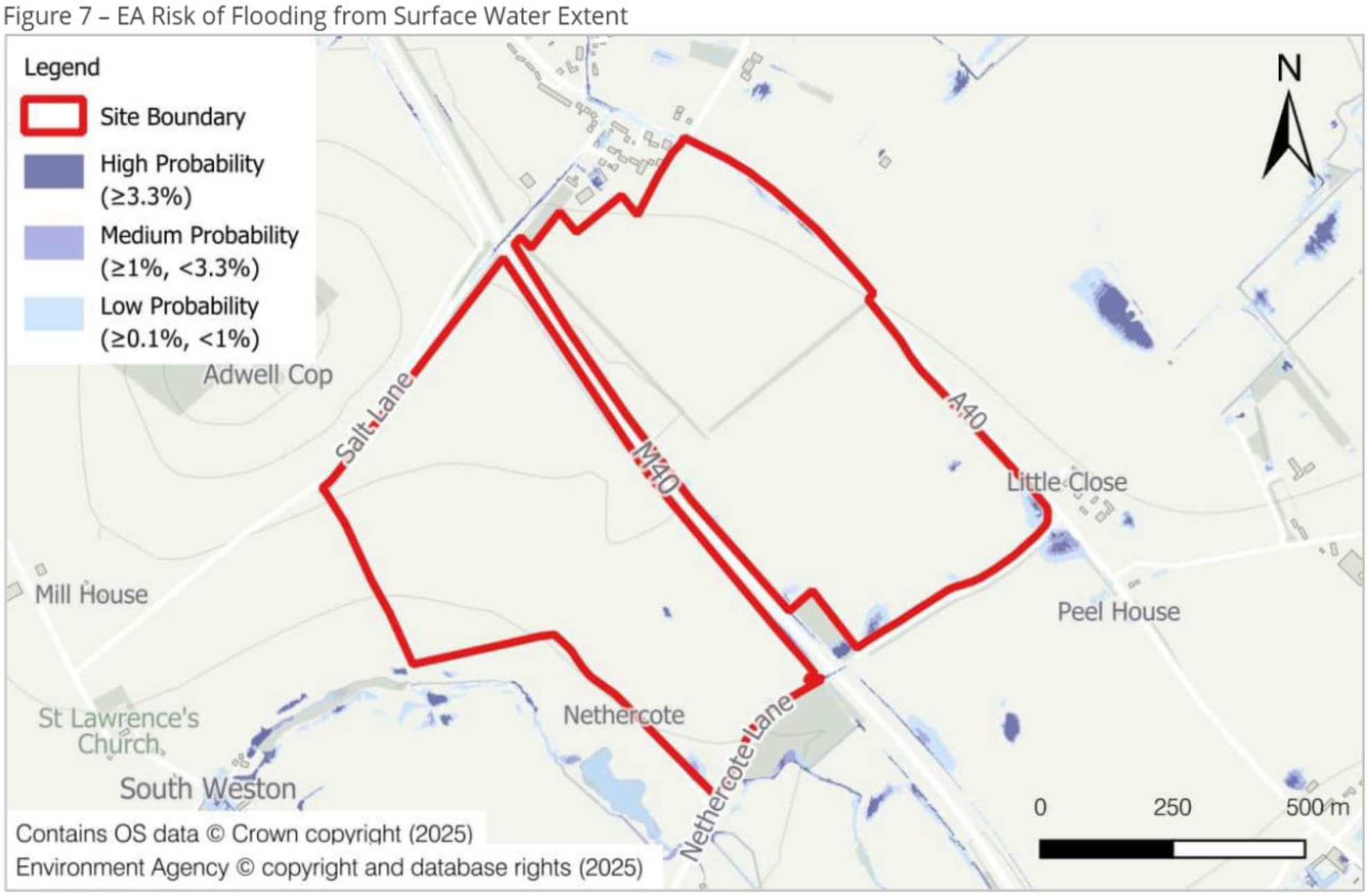
When interpreting the surface water flood map information, it needs to be taken into account that surface water mapping is generated from information that is largely high-level. The flood mapping must be correctly interpreted in order to give a fair representation of the site's surface water flood risk and used only as a guide.

The EA Risk of Flooding from Surface Water (RoFSW) extent mapping seen in Figure 7 indicates that, at the present-day scenario, the majority of Area 1 is not identified to be at risk of surface water flooding. This means that each year, the site has less than 1 in 1000 (0.1%) chance of flooding from surface water. There are small, isolated areas of High, Medium and Low probability within Area 1 which are shown to be aligned with slight topographic depressions within this area of the site.

The majority of Area 2 is not identified to be at risk of surface water flooding. As mentioned above, this means that each year, the site has less than 1 in 1000 (0.1%) chance of flooding from surface water. There is, however, an isolated area of High, Medium and Low probability shown within the south-east region of Area 2. The probability definitions can be seen below for reference.

- **High probability** – each year, this area has a chance of flooding of greater than 1 in 30 (3.3%);
- **Medium probability** – each year, this area has a chance of flooding of between 1 in 100 (1%) and 1 in 30 (3.3%); and,
- **Low probability** – each year, the area has a chance of flooding of between 1 in 1000 (0.1%) and 1 in 100 (1%).

Figure 7 – EA Risk of Flooding from Surface Water Extent



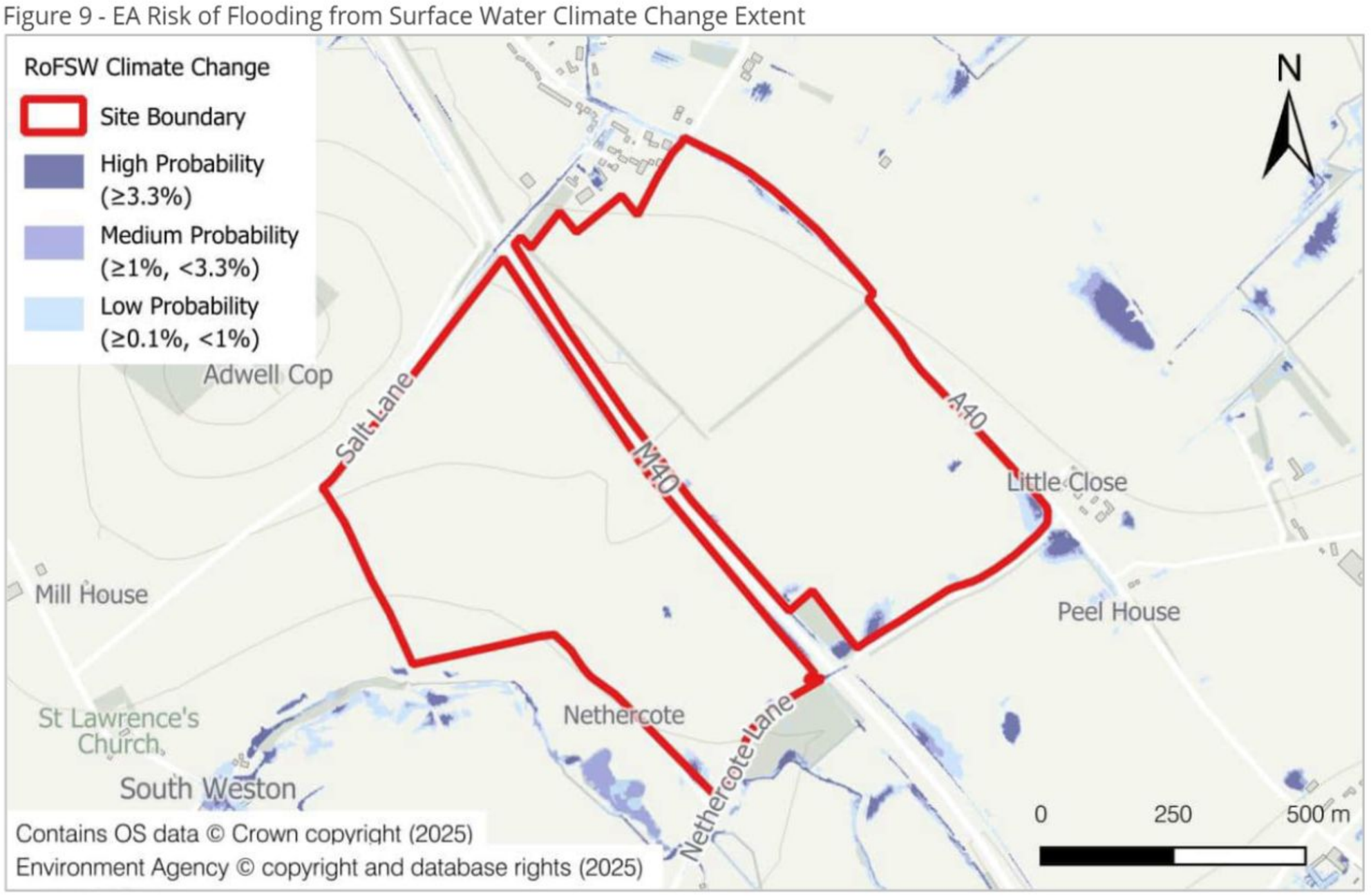
The depth mapping shown in Figure 8 illustrates the annual probability of surface water flooding to specific depths. As seen in the mapping, the site is not considered to be at either High, Medium or Low probability (each year) of depths ranging from 0.2m up to 1.2m. Therefore, it can be assumed that the areas of High, Medium and Low risk, shown in Figure 7, illustrates surface water flooding up to depths of 0.2m within these extent areas.

Figure 8 - EA Risk of Flooding from Surface Water Depths

The EA RoFSW extent mapping seen in Figure 9 indicates that, at the future scenario (taking into account Climate Change), the majority of Area 1 is not identified to be at risk of surface water flooding. This means that each year, the site has less than 1 in 1000 (0.1%) chance of flooding from surface water. Similar to the present-day mapping, there are small, isolated areas of High, Medium and Low probability within Area 1 which are shown to be aligned with the low topography along the northern, eastern and southern region of Area 1.

The majority of Area 2 is not identified to be at risk of surface water flooding. As mentioned above, this means that each year, the site has less than 1 in 1000 (0.1%) chance of flooding from surface water. There is, however, an isolated area of High, Medium and Low probability shown within the south-east region of Area 2.

Figure 9 - EA Risk of Flooding from Surface Water Climate Change Extent



The depth mapping shown in Figure 10 illustrates the annual probability of surface water flooding to specific depths. As seen in the mapping, the site is not considered to be at either High, Medium or Low probability (each year) of depths ranging from 0.2m up to 1.2m. Therefore, it can be assumed that the areas of High, Medium and Low risk, shown in Figure 9, illustrates surface water flooding up to depths of 0.2m within these extent areas.

Figure 10 - EA Risk of Flooding from Surface Water Climate Change Depths

The PFRA states that several incidents of surface water (and groundwater) flooding events have had an adverse impact for the county in terms of properties flooded and disruption to infrastructure and services. Furthermore, the surface water event which had the biggest impact on the county was recorded in July 2007; however, there are no reportable instances locating the site within this or any other surface water flooding events.

> The overall risk of surface water flooding affecting the site is **Low**. Further considerations are made within Sections 3 & 4 in relation to keeping this risk to a low designation in the long-term.

2.4 Reservoir Failure

Assessment of risk of a reservoir failure may be interpreted as the extent of flooding that would occur, should any reservoir that has a capacity larger than 25,000m^3, suffer a catastrophic failure. Mapping of this nature is described by the Environment Agency as a very worst-case scenario, with a flood event of this type being extremely unlikely to occur.

The EA Risk of Flooding from Reservoir Failure mapping (Figure 11) is based on two extents:

- Wet Day (National) - This data shows the individual flood extents for all large, raised reservoirs in the event that they were to fail and release the water held on a “wet day” when local rivers had already overflowed their banks.
- Dry Day (National) - This data shows the individual flood extents for all large, raised reservoirs in the event that they were to fail and release the water held on a “dry day” when local rivers are at normal levels.

Figure 11 – EA Risk of Flooding from Reservoir Failure

The EA Risk of Flooding from Reservoir Failure mapping shows that the site is located approximately 5.6km east of the nearest wet day extent & 6.1km east of the nearest dry day extent. Current legislation ensures that reservoirs are inspected regularly and essential safety work is carried out as required.

There are no reportable instances of reservoir failure located at or within the vicinity of the site from review of the PFRA, SFRA and LFRMS.

> The risk of flooding from reservoir failure is therefore **Negligible** and no further consideration from this flood source is deemed necessary as part of this report.

2.5 Groundwater

Flooding from a groundwater source often occurs during or following a period of prolonged wet weather within areas that are low lying underlain by permeable rocks (aquifers). When aquifers are at their maximum holding potential, flooding at surface level can occur from beneath the ground.

Groundwater as a sole flooding mechanism is often regarded as low risk as it often relies on a coinciding rainfall, or flood event from an additional source to become a flood risk. The main contributory factor that will enhance the risk of groundwater flooding, is prolonged periods of high rainfall, which result in the groundwater saturation level rising to the point where it reaches the surface.

Online BGS mapping shows the majority of the bedrock geology beneath the site to comprise both West Melbury Marly Chalk Formation – Chalk, with a small area comprising Glauconitic Marl Member - Sandstone, glauconitic. Both bedrock geology types outlined above are defined by the EA as a 'Principal' aquifer. These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

No superficial deposits are shown to overlain the site location.

The nearest borehole to the site with groundwater information is located approximately 90m east of Area 1 (ref: SU79NW29), which has a depth of approximately 3.96m below ground level (bgl). From review of this borehole log, no groundwater is understood to have been struck.

From review of other available boreholes within the wider area in which the site is located within, Borehole (ref: SU79NW120) which is located approximately 115m east of Area 1, has a depth of approximately 6.4m bgl, where groundwater is shown to have been struck at approximately 4.8m bgl. The geology of this borehole is the same as that at the site location.

The PFRA indicates that there is only one groundwater-only event in the recorded which is clearly recorded as causing flooding to a property. The prolonged event of winter 2000/01 saw some of the highest groundwater levels recorded within the chalk and oolitic limestone aquifers. There is no reportable information locating the site within this event.

The SFRA states that compared to other flood sources, current understanding on the risks posed by groundwater flooding is limited and mapping of flood risk from groundwater is in its infancy.

> The risk of flooding from groundwater flooding is therefore **Low**. No further consideration is deemed necessary as part of this FRDA.

2.6 Artificial Flood Sources

Flood risk from artificial sources would include the failure of man-made drainage or water supply network. Although the likelihood of such an occurrence is highly unpredictable, it is recommended that any proposed designs for the site take into account the location of any existing below ground services, in order to avoid any inadvertent flooding taking place during the construction phase and in the future.

As seen within Table 5-5 of the SFRA, the postcode area in which the site is located within (OX49 5), is indicated to have approximately 10 sewer related flooding incidents; however, there are no reportable instances of sewer flooding located or within the vicinity of the site.

> In summary, the overall risk to the site from artificial sources is **Low** and no further consideration from this flood source is deemed necessary as part of this report.

2.7 Summary

Table 1 provides a summary of the classification of risk to the site from all flood sources and indicates where further considerations are required in the context of the proposed development.

Table 1 - Flood Risk Summary

Flood Source	Overall Risk Classification	Additional Considerations
Fluvial	Low	None.
Tidal	Negligible	None.
Surface Water	Low	See Sections 3 & 4.
Reservoir Failure	Negligible	None.
Groundwater	Low	None.
Artificial Sources	Low	None.

3 Flood Risk in Planning Context

This report has so far evaluated all potential flood risk sources that may affect the site. The following sections describe the identified flood risks in the context of the proposed development and provide recommendations, where required, for the mitigation or reduction of those risks to enable safe development.

3.1 Flood Risk Status

The EA's Flood Map for Planning shows that the site is located within Flood Zone 1, land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

From review of all potential flood sources, as mentioned within Section 2, fluvial, surface water, groundwater and artificial sources are all considered to pose a Low risk to the site, with both tidal and reservoir failure considered to pose a Negligible risk.

3.2 Development Viability

The Environment Agency classifies different types of development according to their perceived vulnerability to flood risk. The proposed development is understood to comprise the erection of solar panels and a substation as well as a new road and green vegetational areas.

Based on the EA vulnerability classification system outlined in Table 3 of the Planning Practice Flood Risk and Coastal Change Guidance (2022), the proposed development is considered 'Essential Infrastructure'. Based on the vulnerability classification and the proposed developments location within Flood Zone 1, the site is therefore considered acceptable in terms of planning.

3.3 Impact on Flooding Elsewhere

The site is not within an area at risk of flooding from rivers or sea and therefore does not remove or reduce flood storage from these sources. Surface water drainage is discussed below.

Drainage – Surface Water

As part of the development design, it should be ensured that any modification of any private external surface water drainage systems, does not increase surface water flooding elsewhere. This should be done by minimising hard surfacing where possible and by adopting the use of permeable surface materials. Further information on the drainage strategy for the proposed development is provided within Section 4.

4 Drainage Strategy

4.1 Introduction

This section looks to identify means of managing future flood risk on site, which would be attributed to surface water and drainage. The FRDA has thus far identified that the site is currently at Low risk of surface water flooding. The principles for the future management of drainage on site have been outlined within this section to ensure that risk can be sustainably managed for the lifetime of the development.

4.2 SuDS Summary

New developments are required to ensure that the discharge of surface water can be sustainably managed and not increase the risk of flooding on site or elsewhere. Oxfordshire County Council as the Lead Local Flood Authority (LLFA) require drainage strategies for developments to follow the Local Standards and Guidance for Surface Water Drainage on Major Developments in Oxfordshire Document[1]. A development should utilise sustainable urban drainage systems unless there are practical reasons for not doing so and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with a specific drainage hierarchy. The Runoff Destination drainage hierarchy will be used as the basis for designing the proposed surface water drainage strategy for this development site.

The proposed development is intended to have an operational lifespan of 40 years. As per the Local Standards and Guidance for Surface Water Drainage on Major Developments in Oxfordshire Document, for developments with a lifetime up to 2060-2115, surface water attenuation on site should be designed to accommodate 40% Climate Change allowance. InfoDrainage version 2025 has been used for undertaking surface water calculations within this section.

4.3 Site Conditions

As discussed in Section 1.5, the whole site (excluding cable corridor) comprises an area of approximately 87ha, which currently consists of greenfield land. It is assumed that there are no private or public sewers on site.

Run-off from the panels will discharge directly onto the ground adjacent to and beneath the structures where it will soak into the ground at the same rate that it presently does in its existing greenfield state. Similarly, any rainwater falling onto the permeable access tracks will soak into the ground beneath at the same rate that it presently does. Thus, the existing hydrological regime will be maintained without resulting in any increased volume or rate of run-off.

4.4 Greenfield Runoff

The proposed development will have a very limited extent of impermeable ground cover. The area beneath the solar panels will remain grassland and the post development site infiltration rate will not change.

[1] https://www.oxfordshirefloodtoolkit.com/wp-content/uploads/2022/01/LOCAL-STANDARDS-AND-GUIDANCE-FOR-SURFACE-WATER-DRAINAGE-ON-MAJOR-DEVELOPMENT-IN-OXFORDSHIRE-Jan-22-2.pdf

Rainwater falling onto each panel will drain freely onto the ground beneath the panel and infiltrate into the ground at the same rate as it does in the site's existing greenfield state. Thus, the total surface area of the photovoltaic array will not be considered an impermeable area in this assessment.

The extent of impermeable area created as a result of the proposed development is considered to be minor (circa 1260m^2 which comprises 0.22% of the total site area on the basis that 58ha will be used for solar panel installation).

QBAR has been calculated for an entirely greenfield site and one with 0.22% impermeable area using the ICP SUDS calculation within InfoDrainage (the latter classified as the Urban value seen in Table 2 below). Copies of the InfoDrainage greenfield runoff calculations are included in Annex C. A summary of the greenfield runoff rates is shown in Table 2.

Table 2 - Existing Site Runoff

Return Period (Yrs)	Greenfield Area Runoff Rate (l/s)
1	130.4
QBAR Rural	145.4
QBAR Urban	153.4
30	344.2
100	479.9

The mean annual peak rate of runoff, referred to as QBAR in ICP SUDS Method, for a greenfield site is 145.4l/s. Whereas the urban representation for QBAR is calculated as 153.4l/s. These calculations show that this effect is minimal and equates to an increase of 8l/s, or 6% of the greenfield rural runoff rate. This is not deemed significant.

The Quick Storage Estimate function of InfoDrainage has been used to calculate the approximate volume of rainfall for the 1260m^2 area of proposed impermeable area on site (0.22% of total site area), as seen in Figure 12 below. At the design event (1 in 100 year storm with a 40% allowance for CC on rainfall intensity), as seen in Figure 13, the FEH results indicate an additional storage volume of 180m^3.

Figure 12 – Quick Storage Estimate Inputs

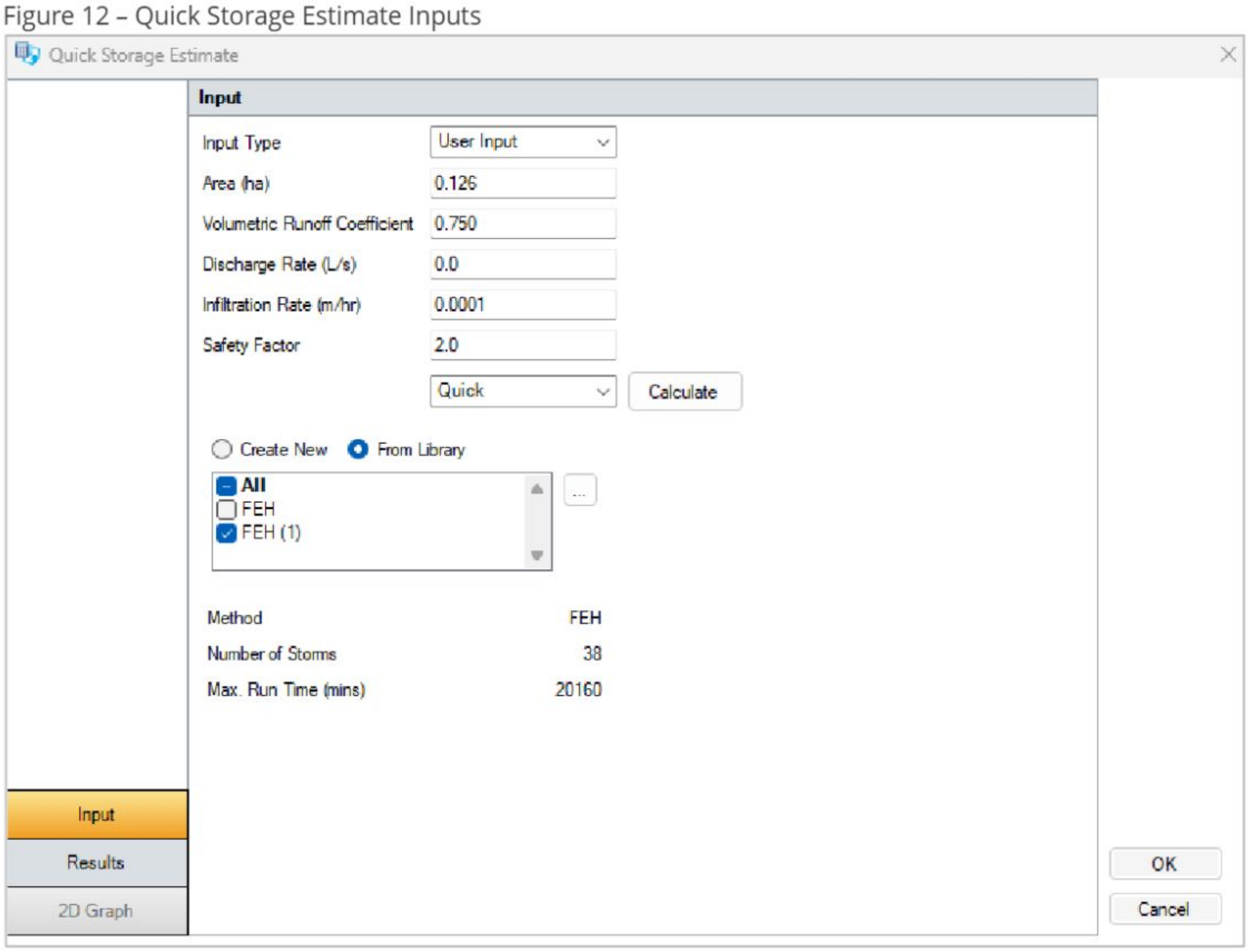
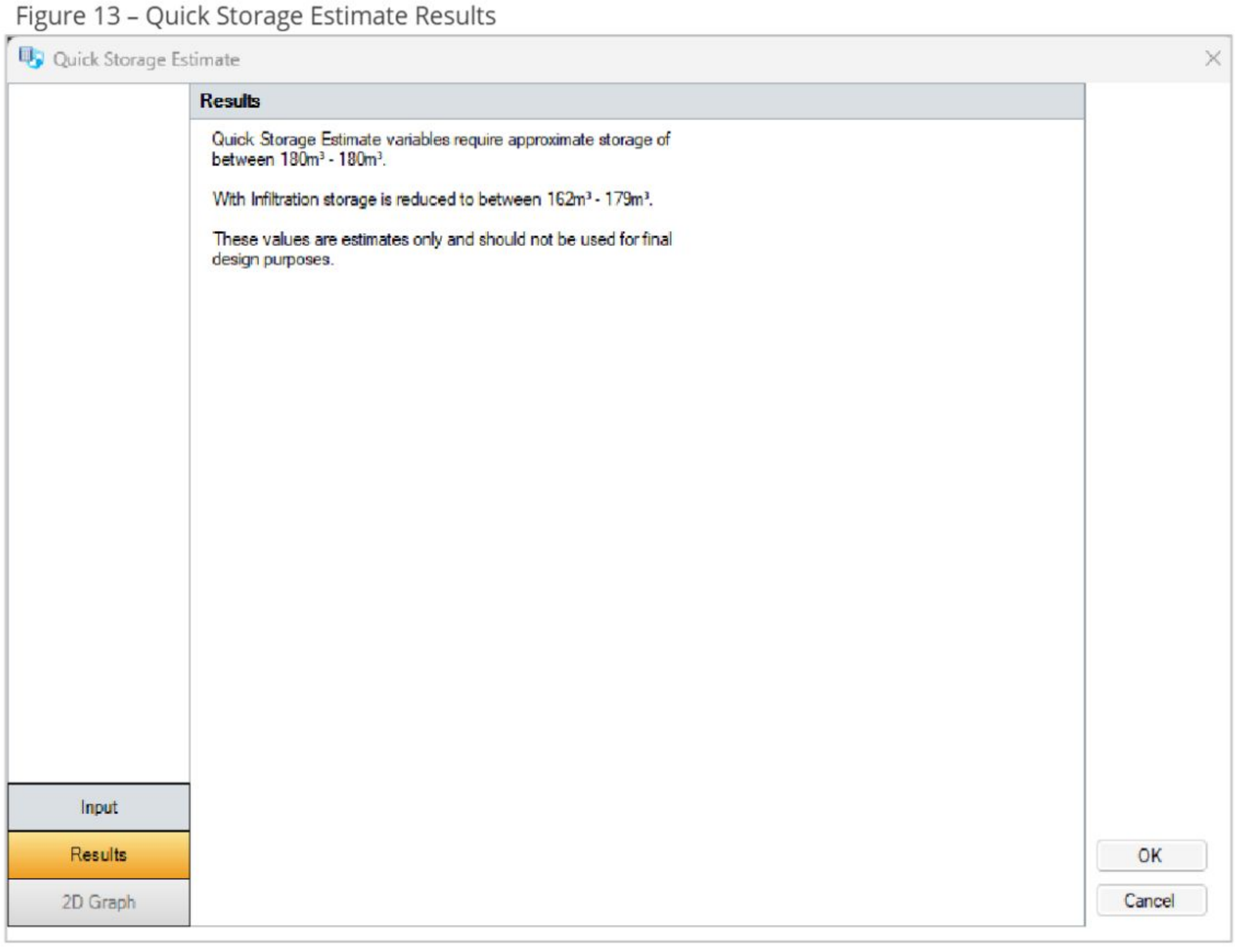


Figure 13 – Quick Storage Estimate Results



It can therefore be concluded that the additional runoff at the design event (1 in 100 year storm +40% CC) amounts to approximately 180m^3. This is based on no infiltration and an assumption that surface water will accumulate within the site without discharging anywhere.

4.5 Surface Water Drainage Strategy

Whilst it is considered that the photovoltaic panels will not result in an increase in surface water run-off flow rates, it is proposed to provide swales in the lower areas of the site to intercept extreme flows which may already run offsite. It is emphasised that the swales do not form part of a formal drainage scheme for the development (as no such scheme is required) but are provided as a form of 'betterment'. An illustrative surface water drainage strategy drawing showing the proposed swale locations is seen on Drawing 01.

For the purpose of this planning application, an illustrative surface water strategy has been prepared as seen within Drawing 01, which indicates the presence of swales, which are considered a solution to help mitigate against any potential surface water on site.

The swales have a minimum depth of 0.3m and a base width of 0.5m. The swales have a combined length of approximately 1305m (720m within Area 1 and 585m within Area 2) in depth, providing an overall storage capacity of approximately 196m^3. This is greater than the Quick Storage Estimate volume of additional runoff generated as a result of the minor increase in impermeable area on site (180m^3). Therefore, an extra 16m^3 will be provided to promote a conservative approach. It should be noted that the Quick Storage Estimate volume is based on no infiltration; however, there will be a level of infiltration from the swales. This will provide additional storage capacity.

The proposed access road will be permeable in nature (e.g. gravel), which would continue to allow infiltration through this area.

The provision of swales has a minor benefit in reducing overland flows during extreme rainfall events. On this basis the proposed development would not increase flood risk onsite or elsewhere and would preserve the application site's natural drainage regime.

4.6 Maintenance

Table 3 below indicates likely maintenance requirements for the swale storage proposed. The following information has been derived from Table 17.1 of the SUDS Manual guidance.[2]

Table 3 - Swale Maintenance Requirements

Maintenance	Action	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.

[2] http://www.scotsnet.org.uk/documents/NRDG/CIRIA-report-C753-the-SuDS-manual-v6.pdf

Maintenance	Action	Frequency
	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 reseeding.	As required.
	Relevel uneven surfaces and reinstate design levels.	
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface.	
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip.	
	Remove and dispose of oils or petrol residues using safe standard practices	

4.7 Foul Discharge

The proposed development is for a solar panel site and therefore will not require a foul sewer or consideration of foul discharge.

4.8 Summary

Based on the above findings, an appropriate drainage strategy has been outlined which incorporates swales along the eastern extent of Area 1 and the southern/western extent of Area 2. The proposed road surface should be permeable in nature. Maintenance of the swales should follow Table 3 of this report, to help provide mitigation against any residual surface water risk.

5 Conclusion

The site has been assessed for flood risk from a variety of flood sources. The combination of the site being located within the EA designated Flood Zone 1 and there being no identified reported incidents of nearby flooding, equates to fluvial risk being Low and tidal risk being considered Negligible.

Surface water risk is considered Low and furthermore, there are no reported incidents of surface water flooding located at the site. All other sources of flooding are also considered Low or Negligible at the site.

This report has outlined recommendations for the development to incorporate during the design stage which will seek to keep the risk designation of surface water as Low. To ensure the positive drainage of the site, swales should be incorporated along the eastern extent of Area 1 and part of the western boundary, and the southern/western extent of Area 2. An illustrative outline drainage strategy has been designed so as to manage surface water on site, and that no flooding shall occur up to and including the 1 in 100 year + 40% CC storm event.

This report therefore demonstrates that the proposed development:

- Is suitable in the location proposed;
- Is unlikely to place additional persons at risk of flooding;
- Is unlikely to increase flood risk elsewhere as a result of the proposed development through the loss of floodplain storage, impedance of flood flows or increase in surface water runoff; and,
- Demonstrates compliance with national and local policies.

5.1.2 Limitations of this report

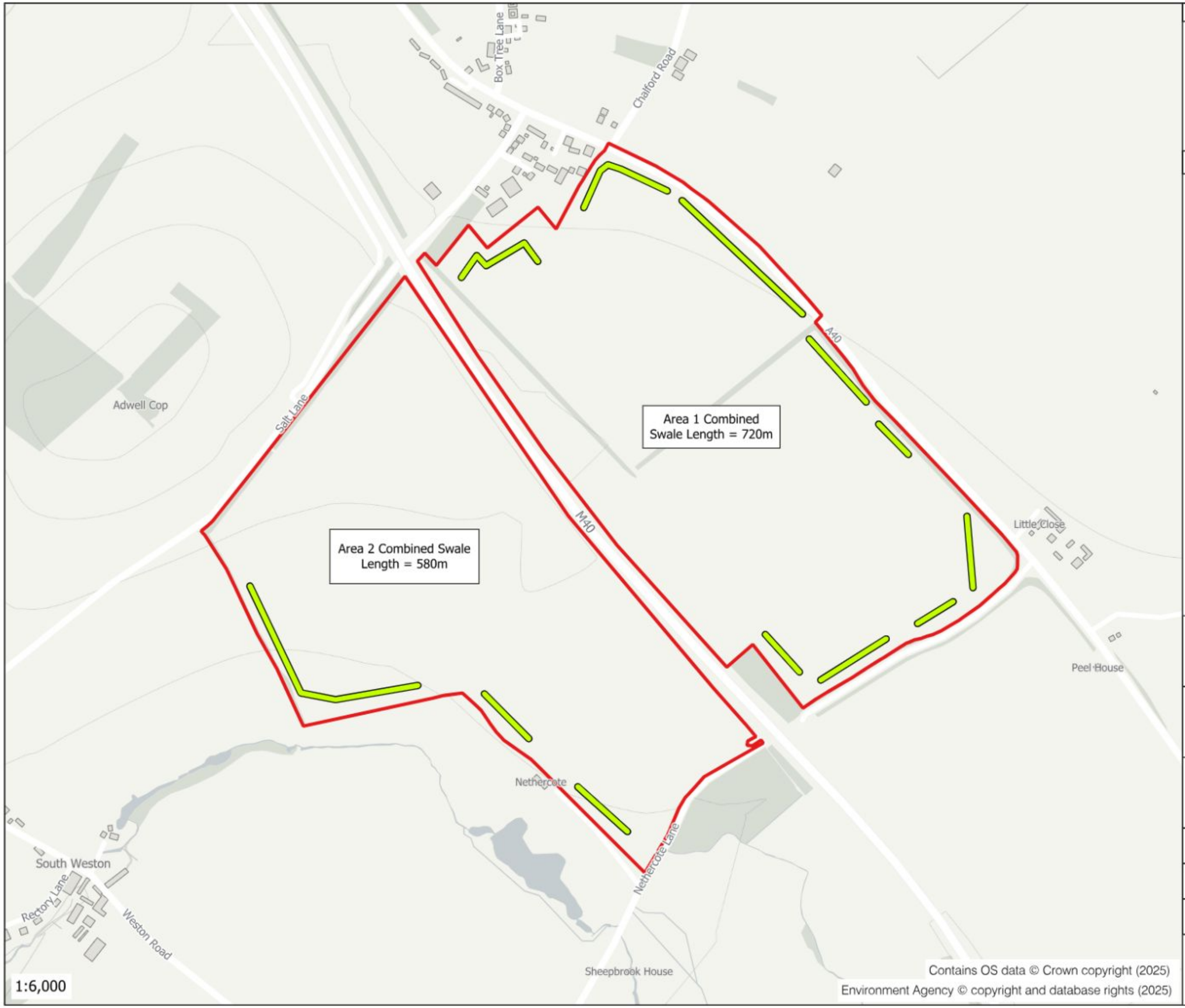
This report has been prepared by Ashfield Flood Risk Solutions Limited (Ashfield) for the sole benefit of the client.

This report has been prepared solely for the benefit of Postcombe and Lewknor Solar Farm Limited (the "Applicant") and has not been assigned to any other third parties. If reliance on this report was required by a third party, this could be arranged for an agreed fee. This report should not be used by the client in relation to any other matters not covered specifically by the scope of the report. If this report does not contain a signature in the Document Control window, then this is an uncontrolled electronic copy and should not be relied upon by the client or any other recipient, as Ashfield cannot give assurances on the source or content of the document. Ashfield has used all reasonable skill, care and diligence in the preparation of this report.

The Flood Risk Assessment report has been designed to satisfy planning requirements, as outlined in Section 1. It is a desktop review of information provided by the client and from selected private and public databases. It only includes a site investigation where specifically referenced. This report does not make a detailed site-specific assessment of the suitability of the existing drainage on the Site. Ashfield accepts no responsibility for the accuracy or completeness of third party data reviewed within this assessment.

This report is provided under Ashfield Solutions Limited Standard Terms and Conditions.

Drawings



Notes

1. Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt, ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. Any discrepancies noted on site are to be reported to the engineer immediately.
4. Do not build from this drawing.

Legend

Site Boundary

Proposed Location of Swales

Note: The proposed swales should be approximately 0.5m in width and 0.3m in depth, providing an overall storage capacity of approximately 196m3

Client

Solar 2 Project E Limited

Project

Postcombe and Lewknor Solar Farm, Hatfield, Oxfordshire, OX49 5SQ

Title

Surface Water Drainage Strategy

Report No.	Drawing No.	Revision
162122-F01	01	C
Scale	**Date**	**Frame Size**
As Shown	07/04/2025	A3
Produced By	**Drawn By**	**Approved By**
HP	HP	HF

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Annexes

Annex A

Site Boundary

Postcombe and Lewknor Solar Farm

Legend

Planning Application Boundary

Site Location Plan

Drawn by: LM Reviewed by: CSS Approved by: JS

Date: 01/04/2025
Reference: 113-031F-250430

Scale @ A3: 1:12,500

0 250 500 m

solar2

Annex B

Proposed Site Plan

Postcombe and Lewknor Solar Farm

Legend

- Site Boundary
- Structure
- Fence
- Inverter
- Substation Compound
- Temp Construction Compound
- HV Cable Line
- Meteo Mast
- MV Cable Line
- MV Interconnector
- Power Line
- Road
- Spare Container
- Customer Substation
- CCTV
- Car Park
- Grid Route

Site Layout Plan

Drawn by: LM Reviewed by: CSS Approved by: JS

Date: 30/04/2025
Reference: 113-038C-250430

Scale @ A3: 1:12,500

0 0.25 0.5 km

solar2

Annex C

InfoDrainage Calculations

ICP SUDS / IH 124 | ADAS 345 | FEH | ReFH2 | Greenfield Volume

Method: (•) ICP SUDS ( ) IH 124

Area (ha): 87.00

SAAR (mm): 685.0 [Map]

Soil: 0.300

Region: Region 6 [...]

Additional Options

Urban: 0.026

Return Period (years): 100

Growth Curve: (None)

Calculate

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	145.4	153.4	479.9	130.4	344.2	479.9

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