THE DROVES
SOLAR FARM

# The Droves Solar Farm

## Appendix 12.2: Flood Risk Assessment

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# 12 Flood Risk Assessment (FRA)

## 12.1 Introduction

### Background

12.1.0 This Technical Appendix (TA) presents the assessment of Flood Risk and surface water run-off management. This Flood Risk Assessment (FRA) has been prepared as part of the DCO Application for the Scheme. The Site is described in more detail in **ES Chapter 3: Order limits and Context [APP/6.1]**. The Order limits form the core study area (CSA) for this assessment.

12.1.1 As the CSA is the Order limits, which contains all of the Scheme components as identified as one of the following which is relevant to the FRA:

- Work No. 1: PV Panels and Mounting Structures
- Work No. 2: Battery Energy Storage System (BESS)
- Work No. 3: Customer Substation
- Work No. 4: National Grid Substation, and associated electrical infrastructure
- Work No. 5: Cable Route
- Work No. 8: Access Tracks; and

12.1.2 Work No. 11: Mitigation and Enhancement Area. An illustrative Masterplan, that identifies the areas above, is shown on **ES Figure 5.1: Concept Masterplan [APP/6.3]**.

12.1.3 As the Scheme does not have a detailed layout, a detailed drainage strategy cannot be provided at this stage, with the principles and design criteria presented in this document. These criteria will be applied at the detailed design phase and commitment for detailed Sustainable Drainage System (SuDS) secured in the DCO Application through this document.

12.1.4 The CSA is located wholly within the administrative area of Breckland Council (the Council) and Norfolk County Council (NCC).

12.1.5 Due to the rural setting in which the Order limits are located, flooding from artificial sources (e.g., highways drainage) has been scoped out of the assessment.

### Methodology

12.1.6 This FRA has been undertaken in consultation with the relevant authorities, and with reference to data, documents and guidance published by the EA, the Lead Local Flood Authority (LLFA) (NCC) and the Local Planning Authority (Breckland Council).

12.1.7 The LLFA and EA responded at the PEIR stage with several comments on the FRA and proposed drainage strategy. The consultation and responses, including how feedback has been incorporated into this document can be found in the Consultation Tables to the **Consultation Report [APP/5.1]**.

12.1.8 Additionally, a meeting was held with the LLFA on 9 September 2025 to discuss feedback received at PEIR stage, to seek agreement on the principles of the SuDS Strategy and to discuss the 2D pluvial modelling which informs this assessment.

12.1.9 As such, the methodology applied in the FRA which accompanied the PEIR has been modified in this FRA, whereby flood risk will be classed as Negligible (where little or no risk is identified), Low (where theoretical risk is identified but mitigating factors may influence flood levels) or Moderate to High (where modelled levels or historical events show risk to the Work Areas)).

12.1.10 Several factors will be considered when attributing the residual risk of flooding to the Scheme, including:

- The depth of flooding
- The hazard to life during flood water ingress
- The velocity of floodwater
- Flooding extent / ingress
- Type of infrastructure affected; and
- Intervening structures / flood protection.

12.1.11 The conclusion section of this FRA provides justification for the risk category using professional judgement and experience of assessing similar types of projects/scenarios, such as Cleve Hill Solar Park, Mallard Pass Solar Farm and Great North Road Solar and Biodiversity Park DCOs, in which both the Examining Authority and Secretary of State were content with the approach adopted in the assessment methodology.

12.1.12 As with all modelling, there will be residual uncertainty in the results and as such a freeboard allowance of 300mm will be applied to flood depths during the design process to account for this.

## Study Area

12.1.13 The CSA is defined by the Order limits. The Wider Study Area (WSA) is defined as a 5km buffer of the Order limits.

## Climate Change Allowances

### Fluvial

12.1.14 As the Scheme is Essential Infrastructure, as defined in Annex 3: Flood risk vulnerability classification of the NPPF, and will have an operational lifespan of 60 years the Scheme

is required to account for a 33% CC allowance (Higher Central) for the 2080s epoch for the North West Norfolk Management Catchment (Ref 12-1).

12.1.15 Where modelling indicates that the required 33% allowance is not available, then a higher proxy value will be used.

12.1.16 For aspects of the Scheme which will remain beyond the 60-year lifespan of the Solar PV arrays, ancillary infrastructure and BESS, the Upper End climate change allowance of 57% will be applied to the watercourses within the catchment.

12.1.17 Whilst the LLFA note that a small section of the Scheme is located within the Cam and Ely Ouse Management Catchment, the nearest watercourse with modelled flood risk to the Order limits is approximately 3km east and will not impact the Scheme.

### Pluvial

12.1.18 North West Norfolk Management Catchment and the Cam and Ely Ouse Management Catchment peak rainfall Upper End Allowance of 40% for the 2070 epoch has been used to assess pluvial flooding.

### SuDS

12.1.19 Whilst the North West Norfolk Management Catchment peak rainfall Central Allowance of 25% for the 2070 epoch is required by the EA, consultation with the LLFA highlighted that a 40% CC allowance should be used where possible.

12.1.20 In accordance with Paragraph 13.1.5 of the Norfolk LLFA Statutory Consultee Guidance (Document Version 7.3, April 2025), the SuDS design for the BESS, Customer Substation and Access Tracks will be sensitivity tested applying a 40% climate change allowance.

12.1.21 This also accords with National Standards for SuDS.

## Guidance and Legislation

12.1.22 This document is intended to meet the requirements of:

- Environment Agency ('EA')
- National Policy Statement (NPS) for Energy EN-1 (Ref 12-2)
- NPS for Renewable Energy EN-3 (Ref 12-3)
- NPS for Electricity Networks Infrastructure EN-5 (Ref 12-4)
- The Council Strategic Flood Risk Assessment (SFRA) Update (2017)
- The Norfolk County Council (NCC) Flood Investigation Reports for the Breckland Area (2014-2021) and Countywide (2022)
- NCC – Drainage design standards

- NCC – Lead Local Flood Authority Statutory Consultee for Planning. Guidance Document (Version 7.3, April 2025)
- National Fire Chiefs Council (NFCC) – Grid Scale Battery Energy Storage System planning – Guidance for FRS
- NFCC – Grid Scale Battery Energy Storage System planning – Guidance for FRS – July 2024 Update (Ref 12-5)
- The National Fire Protection Association (NFPA) 855 Standard for the Installation of Stationary Energy Storage Systems **(**Ref 12-6**)**; and
- The revised National Planning Policy Framework ('NPPF').

12.1.23 As outlined in paragraph 5.8.15 of NPS EN-1 the minimum requirements for FRAs are that they should be proportionate to the risk and appropriate to the scale, nature and location of the project. Importantly, this FRA should identify and secure opportunities to reduce the causes and impacts of flooding overall during the period of construction.

12.1.24 Throughout the early stages of the Scheme design opportunities to identify existing pluvial flow pathways has been undertaken, with a view to identifying positive interventions to reduce the existing impacts of prolonged or intense rainfall events.

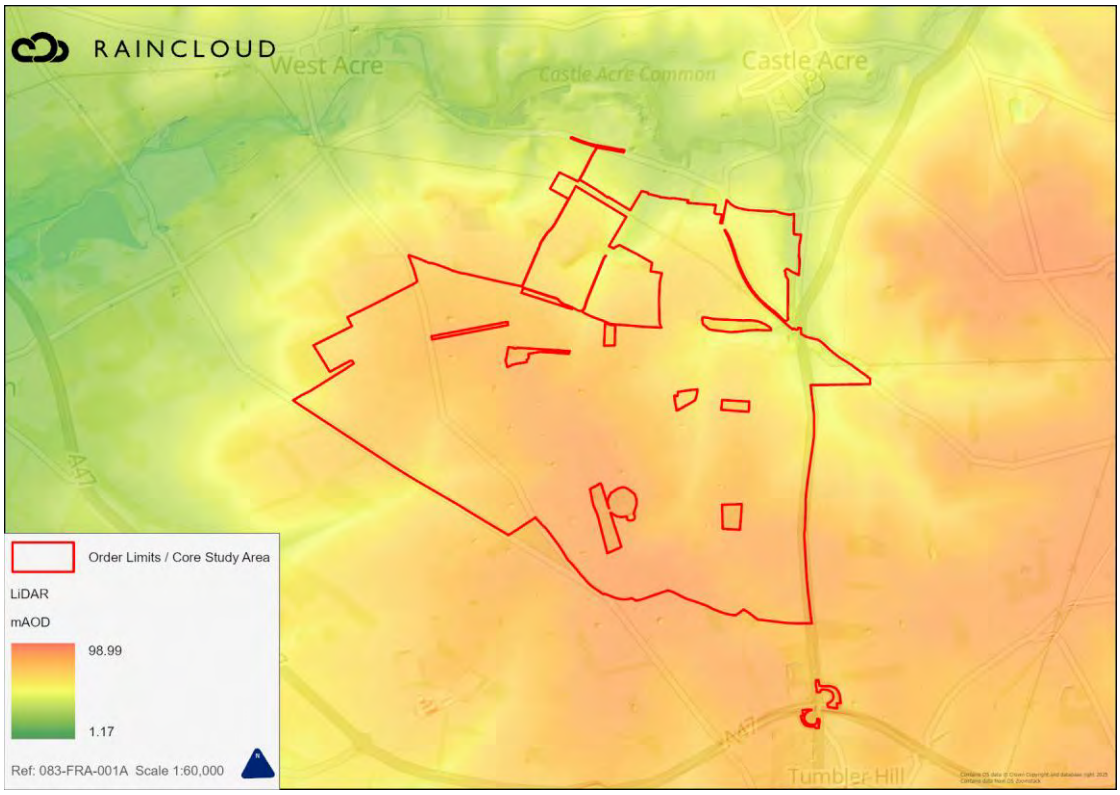
## Site Characteristics

12.1.25 The CSA is generally in arable use with areas in the north and south used for pig farming. Agricultural land is interspersed with woodland, as shown in Plate 12-1.

**Plate 12-1 Greenfield areas - arable conditions in the central section of the CSA**

12.1.26 1m resolution LiDAR data shows that land within the CSA is generally gently sloping, with elevations from 37m above ordnance datum (AOD) in the south to 85m AOD in the northeast, as shown in Plate 12-2.

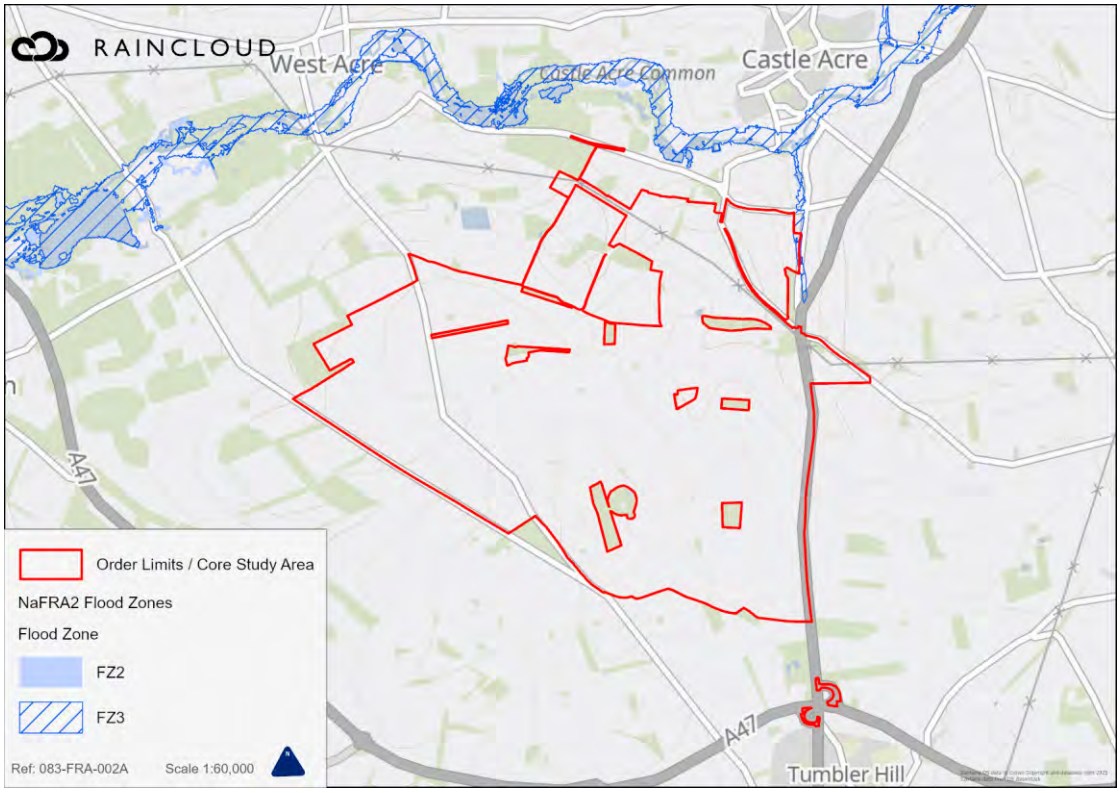
**Plate 12-2 Topography within the CSA**




## Flood Classification

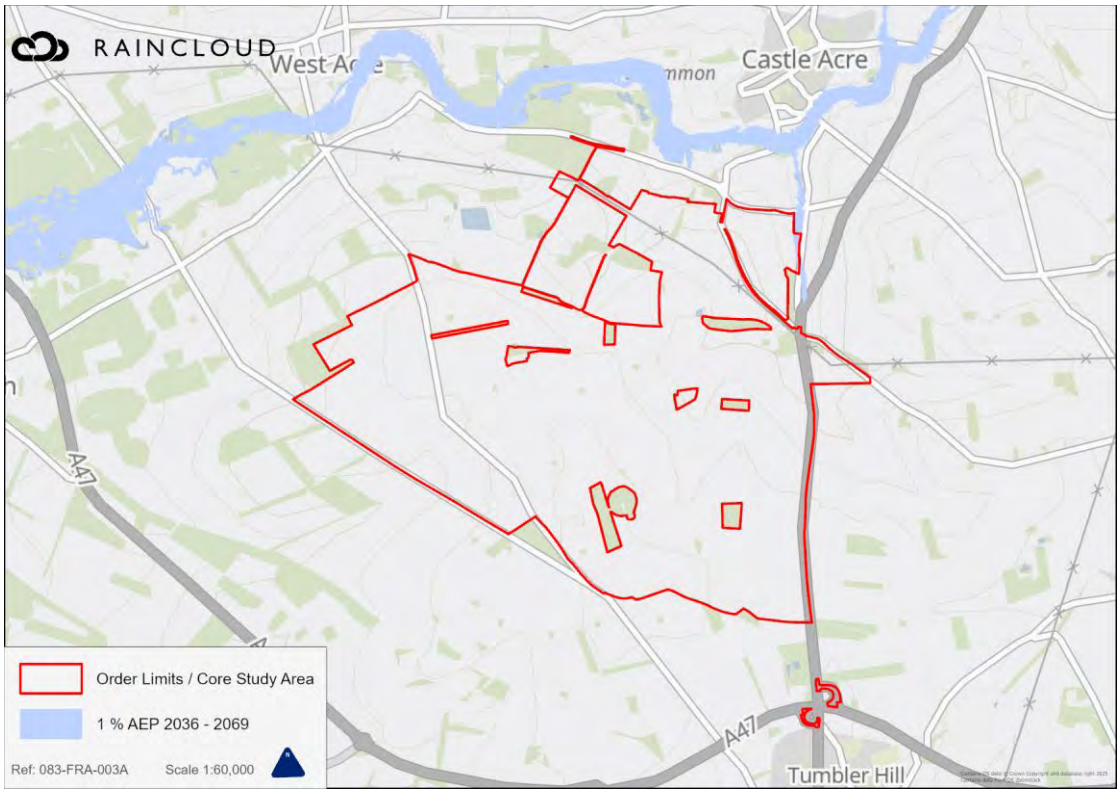
12.1.27 The EA Flood Map for Planning shows that the CSA is mostly located in Flood Zone 1, with a small section in the north located in Flood Zone 2 and 3, as shown in Plate 12-3 and is shown at A3 scale as Figure A12-1-1 in Annex E of this FRA.

**Plate 12-3 Flood Zones**




12.1.28 The EA published new national risk information for flooding and coastal erosion on March 25 2025. This includes future scenarios accounting for climate change (NFRA2), which shows that the CSA is located outside the extents of fluvial flooding beyond the 0.1% AEP event and the 0.1% AEP 2036 - 2069, as shown in Plate 12-4 and at A3 scale as Figure A12-1-2 in Annex E of this FRA.

**Plate 12-4 NaFRA2 Flood Map 2036-2069 (reproduced from the Rivers and sea map - EA)**




12.1.29 The 1.1ha area modelled to flood from fluvial sources is shown in Plate 12-5.

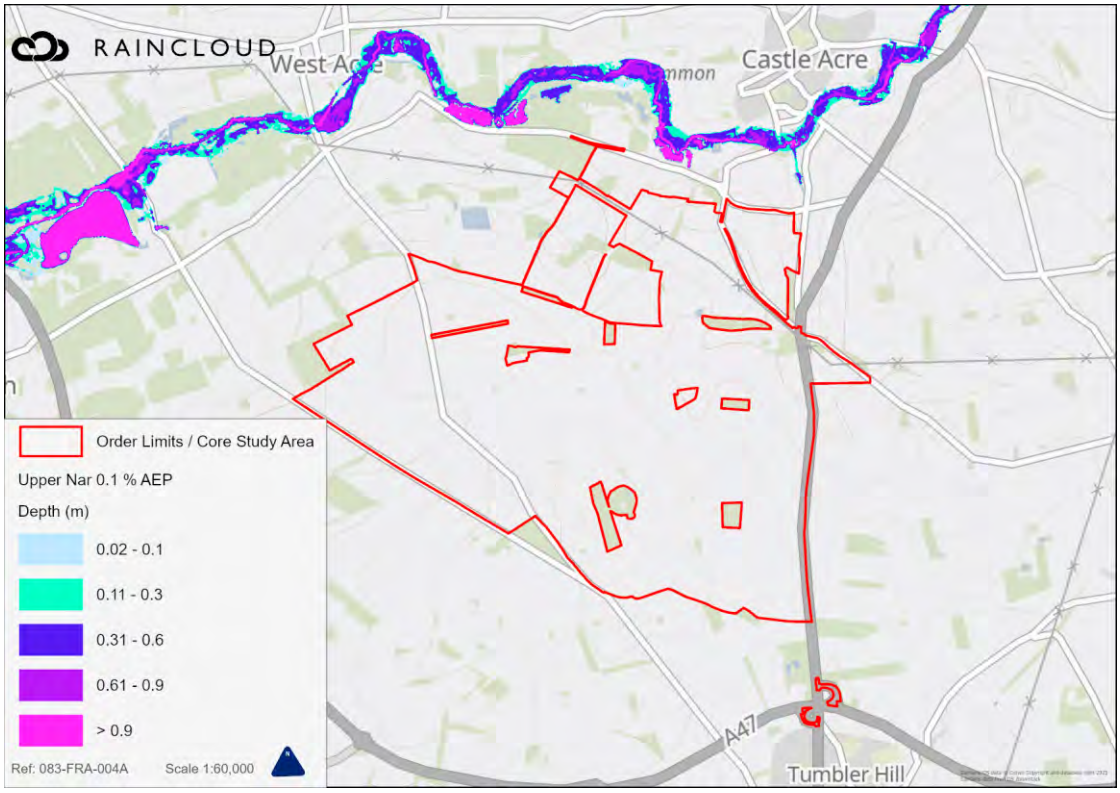
**Plate 12-5 Work No. 11 Mitigation area in Flood Zones 2 and 3**

12.1.30 The SFRA also notes that hydraulic modelling of the River Nar upstream as far as Marham (downstream of the Breckland District) has been undertaken. Royal Haskoning confirmed that even with a major tidal event on the Great Ouse coincident with a fluvial event on the Nar causing it to back up behind the tidal outfall structure, water levels would not be affected as far upstream as Marham, due to the nature of the river gradient (Mott MacDonald 2007).

12.1.31 A data request regarding flood data was provided by the EA on 25 September 2024. Outputs from the Eastern Rivers Modelling Report – Nar (v1.0 May 2015) – see Annex A, show that the 1% AEP Annual Exceedance Probability (AEP) +20% climate change, the 0.5% AEP and the 0.1% AEP flood outlines do not encroach into the CSA.

12.1.32 Flows used within the River Nar model are 56% higher for the 0.1% AEP than the 1% AEP and, therefore, in the absence of a scenario showing the 33% (Higher allowance) and 57% (Upper end) climate change scenarios required for the 2080's epoch in the North West Norfolk Management Catchment, the 0.1% AEP from the River Nar study has been used as a proxy, as suggested by the EA, and is shown in Plate 12-6and at A3 scale as Figure A12-1-3 in Annex E of this FRA.

**Plate 12-6 River Nar – 0.1% AEP Fluvial Flood Depths**




12.1.33 No infrastructure associated with the Scheme is located in Flood Zones 2, 3a or 3b. The only aspect of the Scheme located in Flood Zones 2 and 3 is the mitigation area for skylark, which will continue the current plan use.

12.1.34 An unnamed tributary of the River Nar is located to the east of Southacre Road in the eastern section of the CSA, and is shown in Plate 12-7.

**Plate 12-7 Unnamed linear Ordinary Watercourse to the east of CSA, looking west**

12.1.35 There is a topographical rise of 5m from the southern bank of the unnamed watercourse to the proposed access point in Field 26 to the Scheme.

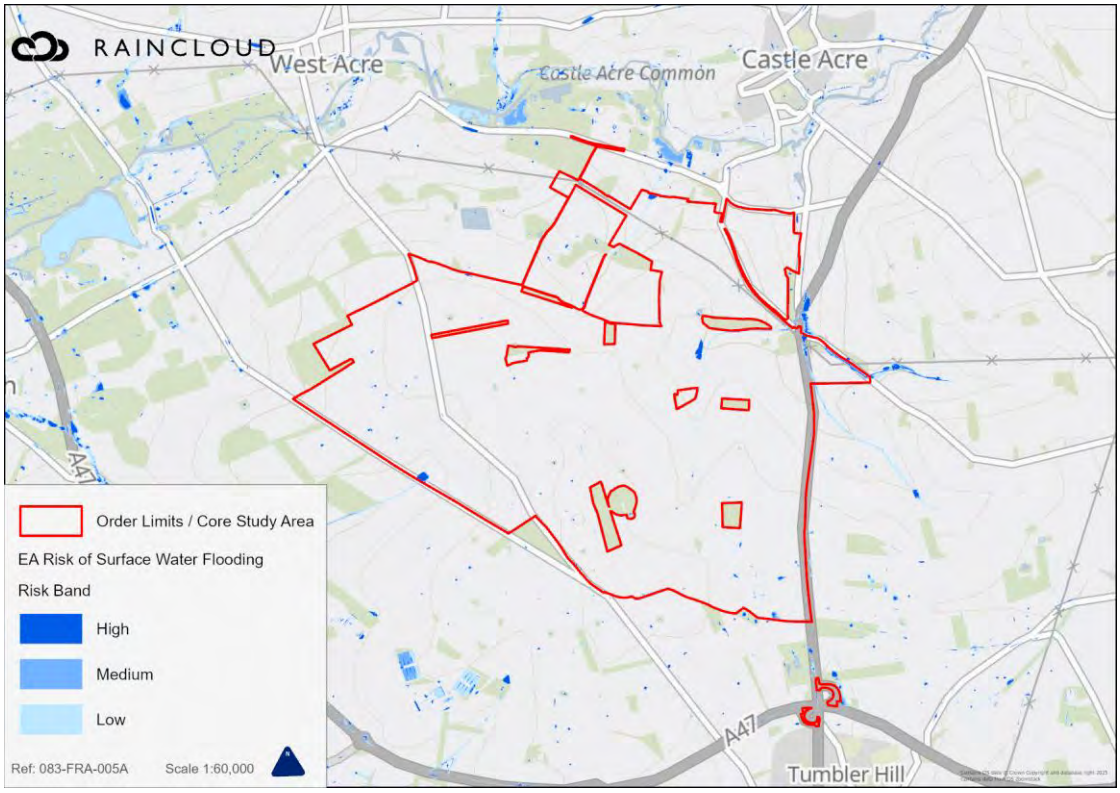
## Flood Defences

12.1.36 The EA Asset Management Database (Ref 12-7) shows that the River Nar is undefended for the reach which passes the Site.

## Pluvial Flooding

12.1.37 The *Flood Risk Assessments: Climate Change Allowances Guidance* (Environment Agency 2022) state that *"for modelling large areas (larger than 5 square kilometres) with rural land use, direct rainfall modelling is unlikely to be appropriate"*. As such, the initial constraints process used the best available dataset, which is the EA pluvial flood depth datasets (Risk of Flooding from Surface Water 2025), which do not apply a climate change ("CC") allowance, as shown in Plate 12-8and at A3 scale as Figure A12-1-4 in Annex E of this FRA.

**Plate 12-8 1% AEP Pluvial Flood Extents (EA – RoFSW 2025)**




12.1.38 The pluvial flow pathway in the central section of the CSA (Fields 24 and 27) flows through Work No. 2: BESS, Work No. 3: Customer Substation and Work No. 4: National Grid Substation. Observations from the site walkover show superficial cover in Fields 24 and 27 to be free draining and are unlikely to promote overland flow substantial enough to create a pluvial flow pathway, as shown in Plate 12-9 and Plate 12-10.

**Plate 12-9 Ground conditions Field 27, looking south**

**Plate 12-10 Ground conditions Field 24, looking south**

12.1.39 The EA pluvial map also shows an area liable to pluvial flooding in Fields 29 and 30. Site observations suggest that topography drains to a low point between the two fields, however topography is not steep and is unlikely to generate flooding depths in this area above 0.5m, as shown in Plate 12-11 and Plate 12-12.

**Plate 12-11 Fields 29 and 30 looking south – pluvial flooding area indicated by arrow**

**Plate 12-12 Fields 29 and 30 looking north – surveyor in pluvial flooding area**

12.1.40 Regardless, pluvial flood depths and flow routes have been verified by direct rainfall method (DRM) 2D pluvial flood modelling in Flood Modeller Pro using the parameters outlined in Table 12-1, while Annex F of this FRA provides a full breakdown of the modelling procedure.

**Table 12-1: 2D Pluvial Flood Model Parameters**

| | |
|---|---|
| Return Period | 1% AEP |
| Storm Duration | 3 hours |
| Season | Summer |
| FEH Rainfall Design Depth | 36.72mm |
| CC Allowance – Central 2070s [Ref. 12-8] | 25% |
| Rural Runoff | 55% |
| Drainage / Infiltration Allowance (0 or 12 mm) | 0mm (Ref 12-9) |
| Manning's n Values | • Floodplain - mature row crops: 0.035 (Ref 12-10)<br>• Roads: 0.01<br>• Buildings: N/A; and<br>• Woodland: 0.1. |
| Model Timestep | 1 second |
| Grid Resolution | 2m |
| Height Data | 1m LiDAR, 2022 |
| Mass Error | 0.0% |
| Largest Courant (Cr) Value | 3.5 |

12.1.41 Storm durations used in modelling reflect the nature of the catchment assessed. As the CSA is predominantly rural the peak 1% AEP event has been assessed, in accordance with the parameters outlined within the Table in Section 4.2.1 of the EA's *What is the Risk of Flooding from Surface Water map?* Report (version 2.0 April 2019).

12.1.42 An Active Area for the 2D domain was chosen based on the area of interest i.e. areas modelled to flood on the EA's pluvial flood depth datasets (Risk of Flooding from Surface Water Depth).

12.1.43 Depths below 0.15m have been filtered in accordance with Section 7.3 Depth of the EA's *What is the Risk of Flooding from Surface Water map?* Report (version 2.0 April 2019) (Ref 12-11) document and are shown in Plates 12-13 to Plate 12-15 and are shown at A3 scale as Figure A12-1-5 to Figure 12-1-7 in Annex E of this FRA.

**Plate 12-13 1% AEP Flood Depths – Raincloud 2D Modelling**

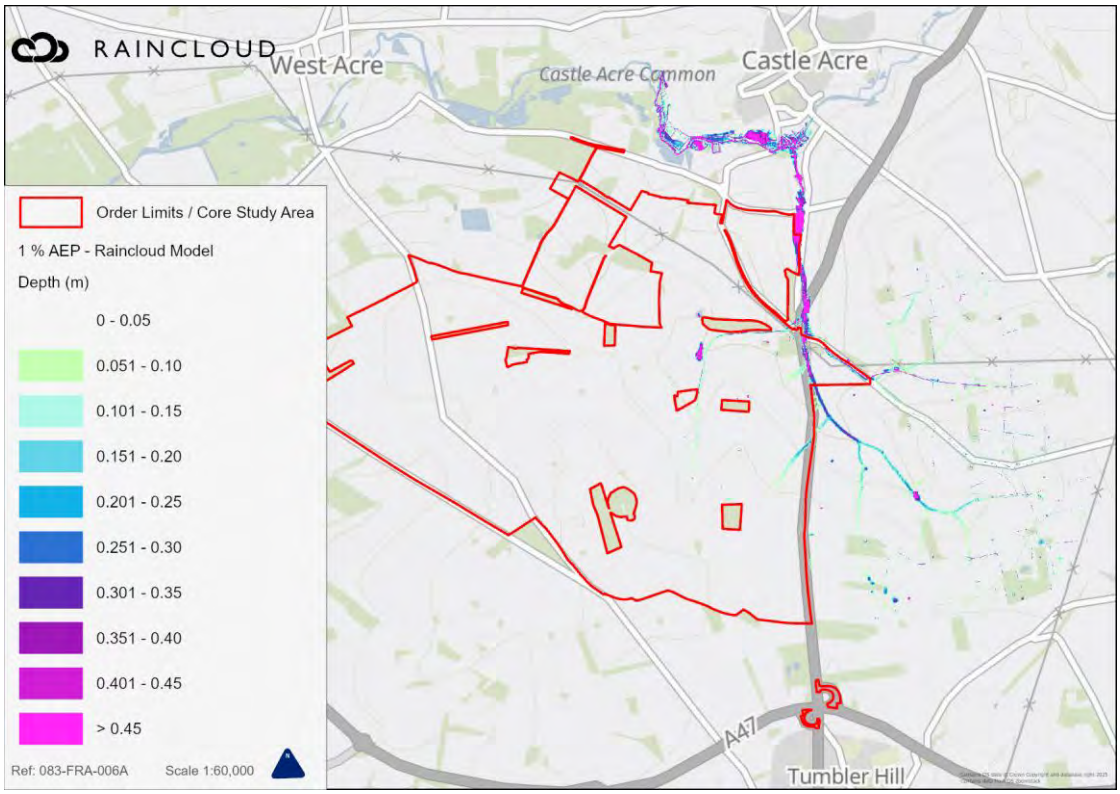


**Plate 12-14 1% AEP + 25% CC Flood Depths – Raincloud 2D Modelling**

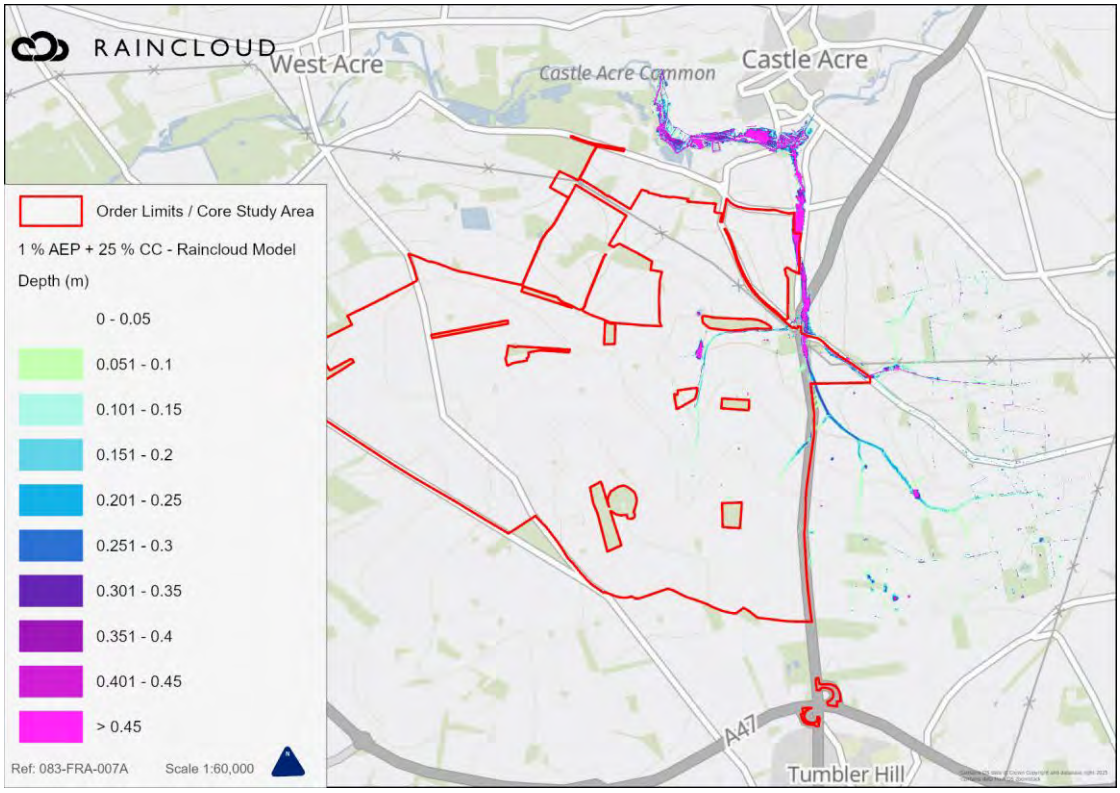
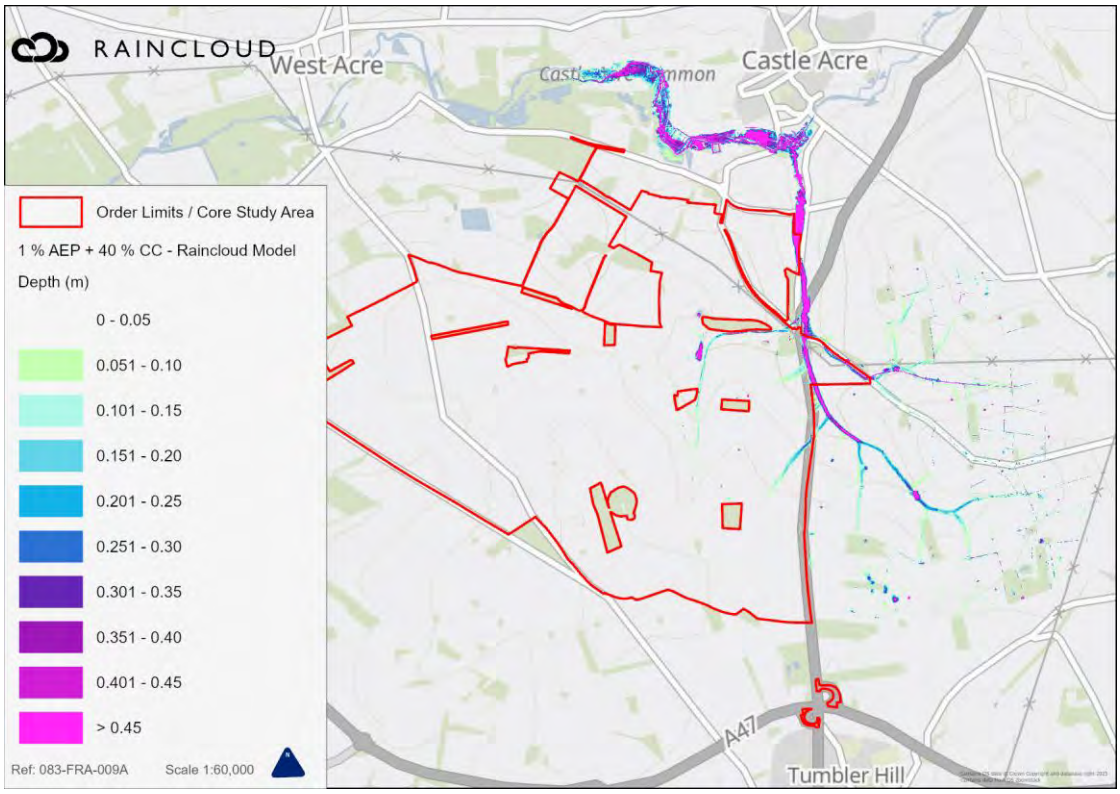



**Plate 12-15 1% AEP + 40% CC Flood Depths – Raincloud 2D Modelling**



12.1.44 Outputs from Flood Modeller, using the ADI solver using double precision equation solving on a 2m grid resolution, show a good correlation with the EA's pluvial flood modelling (see Plate 12-4).

### Groundwater

12.1.45 Figure 7 of the SFRA (Areas Susceptible to Groundwater Flooding) shows that the majority of the CSA is located outside areas classified as at risk of groundwater flooding, with minor areas in the north of the CSA classed as having a <25% risk of groundwater emergence.

12.1.46 Areas identified as at <25% risk of flooding from groundwater are mostly within the Mitigation and Enhancement Areas and Indicative siting zone for the Customer Substation & BESS (Field 35).

12.1.47 No built aspect of the Scheme is located in areas identified as having a 25% or greater risk of groundwater emergence.

### Reservoir Flooding

12.1.48 No section of the CSA is affected by reservoir flooding should the retaining walls of reservoirs in the catchment fail.

12.1.49 The flood extents from reservoirs follows the River Nar corridor and has been scoped out of this assessment.

### Flood History

12.1.50 The Recorded Flood Outlines (EA) dataset shows that no section of the CSA has previously flooded. The nearest recorded flooding from the River Nar is located approximately 10km west (north of Wormegay) and was associated with the 1993 event, where Section 3.4.2 *Historic Records of River Flooding* of the Strategic Flood Risk Assessment (SFRA) notes that the cause of flooding was a breach of flood defences.

12.1.51 The Norfolk County Council (NCC) Flood Investigation Reports for the Breckland Area (2014 - 2021) and Countywide (2022) do not identify any incidents of flooding within the CSA or within close proximity to the CSA.

### Flood Studies

12.1.52 Outputs from the Eastern Rivers Modelling Report - Nar (v1.0 May 2015), show that the 1% AEP Annual Exceedance Probability (AEP) +20% climate change, the 0.5% AEP and the 0.1% AEP flood outlines do not encroach into the CSA.

### Tidal

12.1.53 The Scheme is not located near a tidally influenced stretch of the River Nar.

12.1.54 As outlined in the **ES Appendix 2.1: Scoping Report [APP/6.4]** and agreed with PINS and the EA, tidal flooding is scoped out of this assessment.

# 12.2 Flood Risk Assessment

## Fluvial

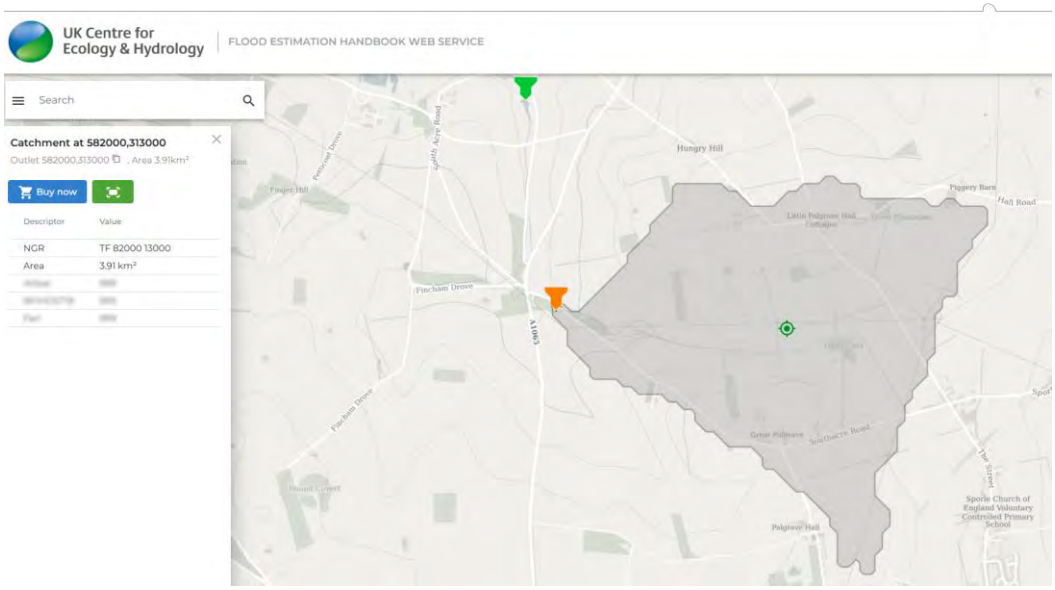
12.2.0 Outputs from the River Nar model show that flows are 56% higher for the 0.1% AEP than the 1% AEP and, therefore, in the absence of a scenario showing the 33% AEP of CC required for the 2080's higher central allowance for the North West Norfolk Management Catchment peak river flow, the 0.1% AEP has been used as a proxy.

12.2.1 All electrical and aboveground infrastructure for the Scheme is located entirely in Flood Zone 1. Only a section of Work No. 11: Skylark and Curlew mitigation, which comprises grassland similar to the existing baseline is located in Flood Zones 2 and 3.

12.2.2 Grassland used for mitigation is classed as Water Compatible (Ref 12-12) as per Annex 3: Flood risk vulnerability classification of the NPPF *i.e.* is an appropriate land use type in Flood Zones 2 and 3.

12.2.3 Given the topographical rise up the Scheme from both the River Nar and the unnamed watercourse and the absence of infrastructure within Flood Zones 2 and 3, there will be no loss of flood storage or conveyance during times of flood.

12.2.4 The linear drainage ditch to the north of Southacre Road drains a catchment of 3.9km$^2$ as it passes the A1065 and is unlikely to be captured in the NaFRA2 flood mapping:




12.2.5 Given the topographical rise from the unnamed linear drainage ditch adjacent to Southacre Road and the aboveground infrastructure of the Scheme, there is limited potential for flood water to encroach into areas of the CSA which will have new aboveground infrastructure, such as Work Nos 1 to 4.

12.2.6 In the absence of a detailed model from the EA, the results from the 2D pluvial modelling outlined previously have been used as a proxy. As shown in Plate 12-14 and 12-15, the

1% AEP +25% CC and 1% AEP +40% CC events stay within the confines of the unnamed linear drainage ditch and only marginally encroach into Work No 6: Works associated with the Solar PV Site in the east of the CSA.

12.2.7 As such the risk of fluvial flooding to and from the Scheme is Negligible.

### Pluvial

12.2.8 The majority of the CSA is located outside areas classified as at risk of flooding for the 1% AEP event, based on the EA Risk of Flooding from Surface Water (RoFSW) mapping and this has been verified using DRM 2D analysis.

### Solar PV Pannels and Mounting System

12.2.9 Electrically sensitive infrastructure, such as inverters, will be located outside the 3.3%, 1% and 1% AEP + CC surface water flooding extent, as shown in Plates 12-13 to 12-15 of this FRA.

12.2.10 The CSA is in agricultural (arable and pastoral) use and is mostly free draining, however it has been observed that some areas in the north of the CSA are prone to generating surface water run-off during extreme or prolonged rainfall events and these areas are associated compaction from pig and poultry farming, as shown in Plate 12-16.

**Plate 12-16 Areas of surface water ponding and generation**

12.2.11 Solar PV arrays will avoid areas of modelled pluvial flood risk or have a leading edge (bottom edge of panels) raised off ground level by approximately 0.4 m, with the exception of areas modelled to flood to a depth of 0.2m or higher for the 1% AEP +40% CC event (in accordance with North West Norfolk Management Catchment peak rainfall allowances (2070s)), whereby the leading edge will be higher, to allow for 300mm freeboard to account for residual uncertainty in the modelling.

12.2.12 Mounting Systems and deer fencing may interact with pluvial flow pathways but have minimal aboveground presence (see Plate 12-17 and Plate 12-18) and are unlikely to materially alter water flow pathways during heavy or prolonged rainfall events which generate overland flows.

**Plate 12-17 Example of perimeter deer fence (wooden post and wire mesh)**


**Plate 12-18 Thin PV Racking Mount**

Photo credit: Rob Sutton - Cotswold Archaeology

12.2.13 As such, the impact of pluvial flooding on Solar PV will be **Negligible**.

### Integrated Conversion Units / 33kV Sub-distribution Switch Rooms and Standalone Conversion Units

12.2.14 The Applicant has committed that Integrated Conversion Units / 33kV Sub-distribution Switch Rooms and Standalone Conversion Units will not be located within areas of surface water flooding.

12.2.15 As such, the impact of pluvial flooding on Integrated Conversion Units / 33kV Sub-distribution Switch Rooms and Standalone Conversion Units will be Negligible.

### Cables

12.2.16 Cables will be located underground in waterproof ducting. Areas of cable trench excavations will not be left open for considerable periods of time therefore limiting the potential interaction with surface water.

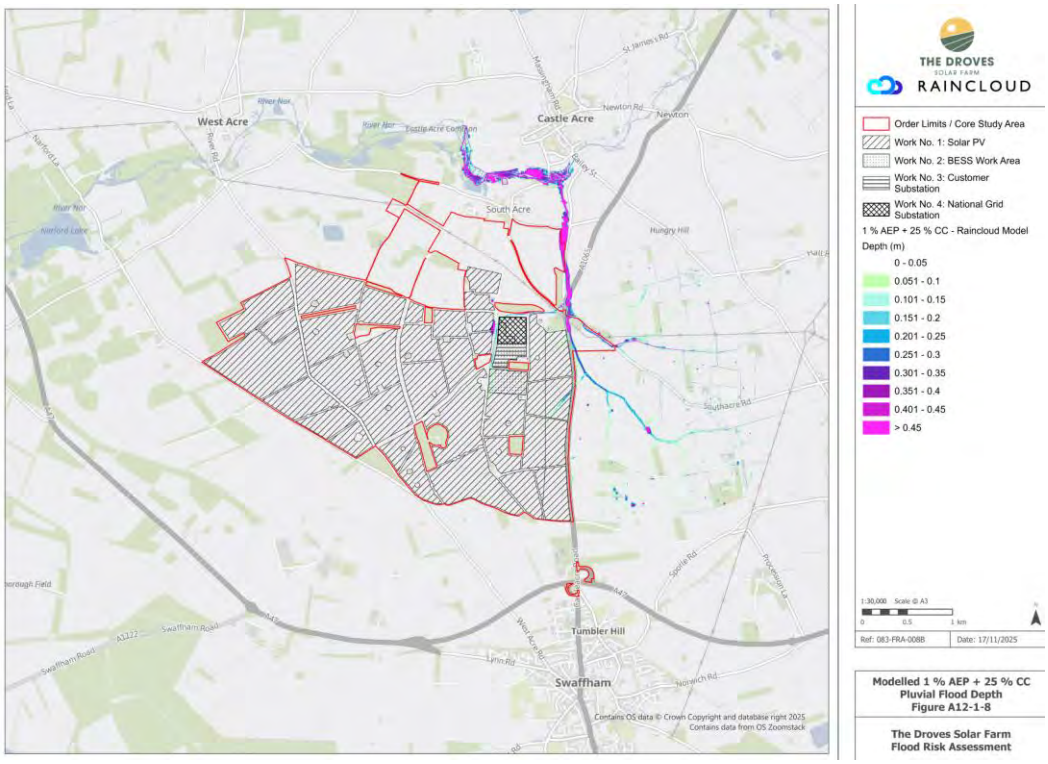
12.2.17 As such the risk of pluvial flooding on the Cables is Negligible.

### BESS compound, Customer Substation and National Grid Substation

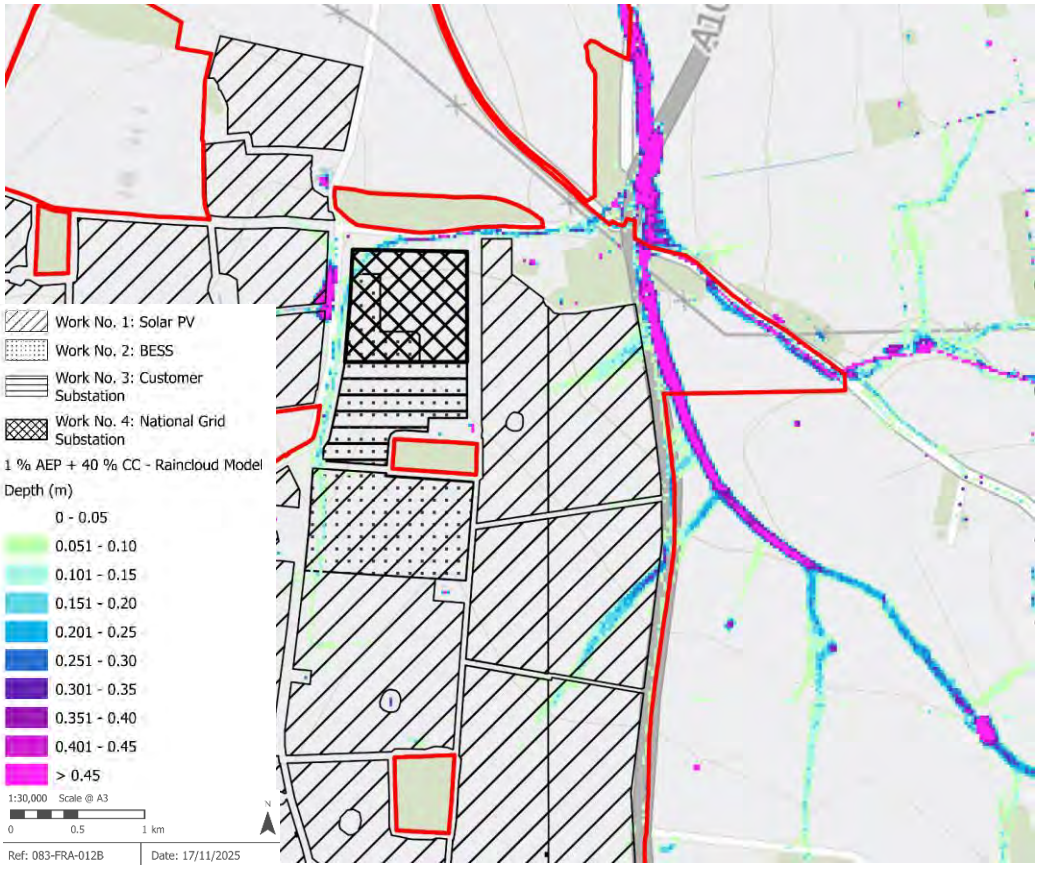
12.2.18 As outlined in previously, minor sections of Work No. 2: BESS compound, Work No 3: Customer Substation and Work No. 4: National Grid Substation are located within an area modelled to be at risk of pluvial flooding for the 1% AEP + 40% CC to a depth of 0.19m.

12.2.19 The EA pluvial flood map outlines have been verified through 2D direct rainfall analysis for the 1% AEP +25% and +40% CC 3-hour summer events using FEH data, as shown in Plate 12-19 and Plate 12-20and are shown at A3 scale as Figure A12-1-8 and Figure A12-1-9 in Annex E of this FRA.

## Plate 12-19 Modelled 1% AEP + 25% CC Pluvial Flood Depth




## Plate 12-20 Modelled 1% AEP + 40% CC Pluvial Flood Depth



12.2.20 BESS units will avoid areas for flooding greater than 0.4m and be designed to remain operational i.e. have resilience or resistance to the modelled flood depth. As outlined in **ES Chapter 5: The Scheme [APP/6.1]**, BESS units will not be located flush to the existing ground with a minimum clearance of 0.1m. BESS units are elevated on corner blocks or a racking frame elevated from the ground, as shown in Plate 12-21.

**Plate 12-21 Typical Corner Pads and racking on BESS units**


12.2.21 As such, pluvial flooding should not pose a risk to the electrically sensitive aspects of the BESS units or substations.

12.2.22 It should be noted that SuDS will be proposed for Work Nos. 2 to 4 during the detailed design phase of the Scheme and designed to the 1% AEP +40% climate change allowance event, meaning the rainfall is likely to enter the drainage network and be conveyed to the attenuation structure(s) rather than flow overland.

12.2.23 As such the risk of flooding to BESS area is Low.

12.2.24 The Additionally, the indicative siting zone for the National Grid Substation has been refined since PIER (now Work No. 4) and only marginally located within the modelled pluvial flow pathway and the detailed design of the Scheme should be able to avoid the pathway for aboveground infrastructure. As such the risk of flooding to the Customer Substation and National Grid Substation areas is Low.

12.2.25 Management of surface water runoff from the Scheme is detailed in Section 12.4 of this FRA.

### Mitigation/Enhancement Areas

12.2.26 The mitigation and enhancement area identified on **ES Figure 5.1: Concept Masterplan [APP/6.3]** is reserved for enhancement measures and these will be compatible with existing flood risk from pluvial sources, and permanent grassland upslope of these areas within these areas will serve to improve the downstream effects of run off.

12.2.27 As such the risk of flooding to Mitigation/Enhancement Areas is Negligible.

12.2.28 The beneficial impacts of enhancement on pluvial flooding are discussed in Section 12.3 of this FRA.

### Access

12.2.29 It should be noted that the existing access point off the A1065 in the northeast of the CSA is likely to flood to depths of up to 0.4m during the 1% AEP event (or higher return period).

12.2.30 As such, the existing alternative access route will be retained in order to access the Scheme during times of flood.

12.2.31 The risk of flooding to access to the Scheme is Negligible.

### Overall Pluvial Risk

12.2.32 Based on the design of the Scheme to avoid placing large above ground structures (e.g. substations and BESS) within the flow paths of surface water and the land management measures described in Section 12.3, the risk of pluvial flooding to and from the Scheme is **Low**.

### Groundwater

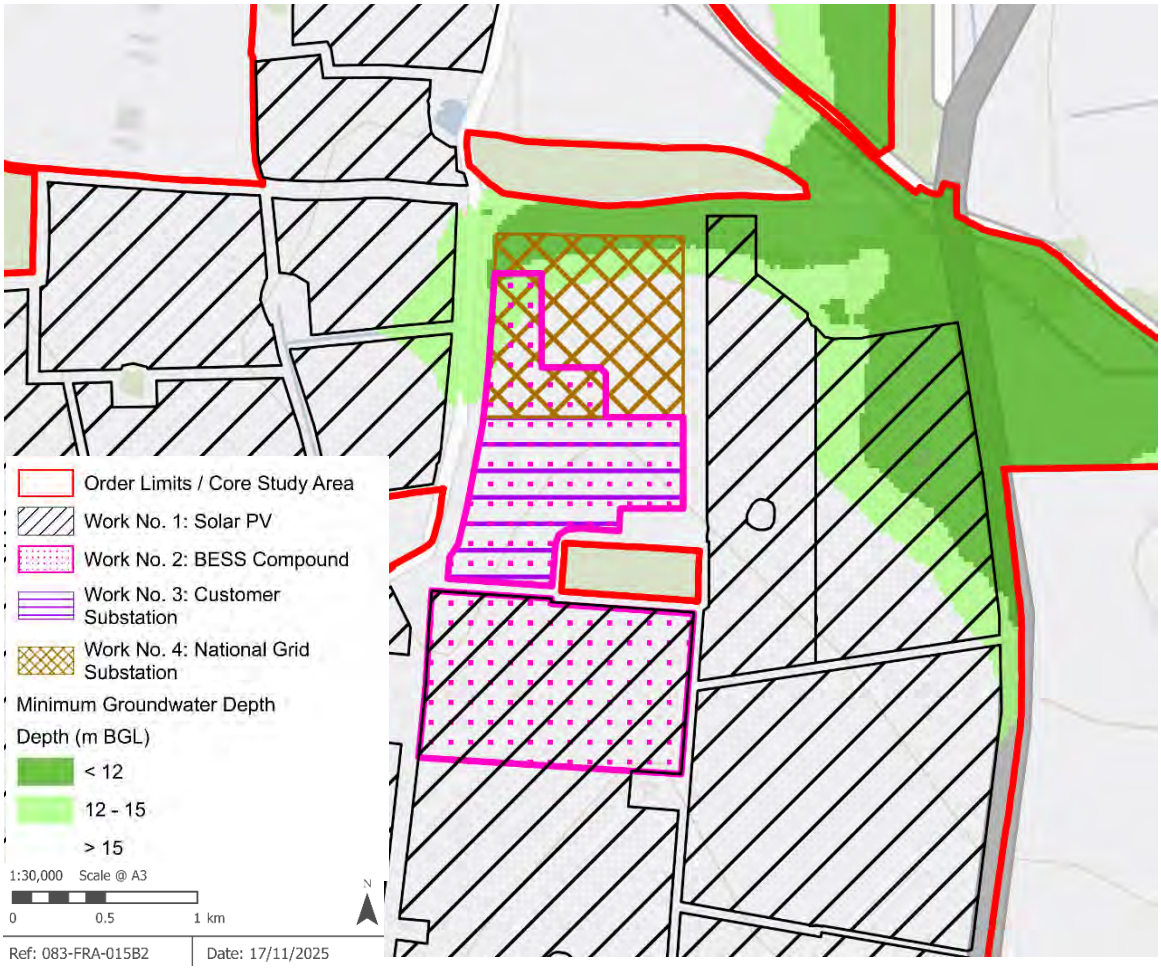
12.2.33 33kV Substations and the BESS compound are the main aspects of Scheme which could be affected should groundwater emerge at the surface, given that the leading edge of PV arrays will elevated from the ground by at least 0.4m, and cables, will be housed in waterproof ducting.

12.2.34 The EA Long Term Flood Risk service (Ref 12-13) reports *"Flooding from groundwater is unlikely in this area"*.

12.2.35 BGS borehole records within the CSA show groundwater was not struck to a depth of 6m BGL.

12.2.36 Triangulation of hydrometric monitoring data available on Hydrology Data Explorer, represented in Plate 12-22 and Figure A12-1-11 in Annex E of this FRA, shows that groundwater levels under the CSA are generally not within 15m of surface level, with the exception of a small section of Work No. 2: BESS compound and Work No. 4: National Grid Substation. The northwestern section of Work Nos. 2 to 4 are located in an area where the maximum piled foundation depth (15m) could directly interact with the maximum recorded groundwater level by approximately 0.1 to 3m. It should be noted that **ES Figure 5.1: Concept Masterplan [APP/6.3]** shows that only the BESS units could be located within this area.

**Plate 12-22 Depth to groundwater**




12.2.37 As such, it is unlikely groundwater will emerge at ground level and interact with built infrastructure.

12.2.38 Triangulation of hydrometric monitoring data available on Hydrology Data Explorer shows that groundwater levels under the CSA are generally not within 15m of surface level, with the exception of a small section of Work No. 2: BESS Compound, Work No. 3: Customer

Substation and Work No. 4: National Grid Substation. The northwestern section of Work Nos. 2 to 4 are located in an area where the maximum piled foundation depth (15m) could directly interact with the maximum recorded groundwater level by approximately 0.1 to 3m. It should be noted that **ES Figure 5.1: Concept Masterplan [APP/6.3]** shows that only the BESS units could be located within this area. It is anticipated that the affected area could be avoided during the detailed design of the Scheme following granting of the DCO.

12.2.39 Once the detailed design is complete, and if the required piling depth exceeds the highest recorded groundwater level, then a Foundation Works Risk Assessment will likely be required to ensure piled foundations do not displace groundwater. This should be completed once construction methods are confirmed and ground investigation data are available.

12.2.40 The Solar PV arrays will be raised off the ground by at least 0.4m on a racking system and therefore will not be affected in the event that groundwater emerges at the surface.

12.2.41 Cabling will be within waterproof ducting. The entry point of any cable or ducting into chambers should also be sealed to prevent water ingress.

12.2.42 Infrastructure for the BESS are unlikely to be flush to ground level e.g. by concrete feet, elevating the BESS units by at least 0.3m AGL, as outlined in the Pluvial Flooding assessment in Paragraph 12.2.18 onwards Should groundwater emanate at ground level, it is likely to spread over a wide area at shallow depth. As such the risk of groundwater interacting with infrastructure is unlikely.

12.2.43 As such the risk of groundwater flooding is Low.

## Sequential Test and Exception Test

### Sequential Test

12.2.44 NPS EN-1 requires, in reference to the NPPG, that the Sequential Test is undertaken to steer new developments to areas with the lowest risk of flooding.

12.2.45 Similarly, Paragraph 174 of the NPPF states that the aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source.

12.2.46 The CSA is mostly located within Flood Zone 1, with only a small section of Work No. 11: mitigation and enhancement for skylark (curlew area unaffected) is located in Flood Zones 2 and 3 and located within the extents of future flood extents for the lifetime of the Scheme.

12.2.47 Paragraph 175 of the NPPF is clear that areas for mitigation/enhancement are exempt from undertaking the test as no built development, access routes etc. are located in Flood Zones 2 or 3.

12.2.48 **ES Chapter 5: The Scheme [APP/6.1]** outlines the approach to Scheme design and site selection.

12.2.49 In addition to flood risk, key considerations for Site selection have included, as outlined in **ES Chapter 4: Reasonable Alternatives and Design Evolution [APP/6.1]**:

- Proximity to an available grid connection
- Proximity to local communities
- Topography
- Shading
- Solar irradiation levels
- Access to the site for construction
- Archaeological assets
- Agricultural land classification (ALC)
- Landscape designations; and
- Ecological designations.

12.2.50 Only a small section of Work Nos. 2 to 4 are located within a pluvial flow pathway with a maximum flood depth of 0.19 for the 1% AEP +40% CC allowance event. Given the marginal encroachment of the pluvial pathway onto the work area it is expected that aboveground infrastructure can be placed outside the flood extents and therefore demonstrate a sequential approach to the design of the Scheme.

12.2.51 Modelling shows a small section of Work No. 1: Solar PV Area (Fields 25 and 26) have flow pathways for the 1 % AEP + 25% and 40 % CC events. The raised nature of the PV arrays means they will be located above the flood depths and the thin racking will have no perceptible effect on flow pathways.

12.2.52 In applying paragraph 175 of the NPPF, a proportionate approach should be taken as outlined in Paragraph 20 (ID: 7-026-20220825) the NPPG **[Ref. 12-14]** . Where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development (therefore addressing the risks identified e.g. by Environment Agency flood risk mapping), without increasing flood risk elsewhere, then the sequential test need not be applied.

12.2.53 It should also be noted that Paragraph 12.4.22 of this FRA commits Work Nos. 2 to 4 to a formal SuDS network to have capacity to accept the 1% AEP +40% CC event, meaning the flow pathway will be captured by the drainage network rather than flow uncaptured over the surface of the Work Nos.

12.2.54 For these reasons the Scheme meets the requirements set out in Table 2 of the NPPG's Flood risk and coastal change section and, therefore, meets the requirements of the Sequential Test established under the NPPF and NPS.

12.2.55 The Exception Test does not, therefore, need to be applied.

### Summary

12.2.56 The Scheme is classed as Essential Infrastructure, as per Annex 3: Flood risk vulnerability classification of the NPPF, which is appropriate in the Flood Zone 1 in terms of flood risk vulnerability.

12.2.57 The Scheme cannot be located outside pluvial flow pathways as access to the National Grid pylons required for grid connection would traverse the pathways of site location.

12.2.58 The Scheme will be designed to remain operational during prolonged or heavy rainfall events.

12.2.59 As such, the Sequential  is passed i.e. the Scheme is located appropriately Essential Infrastructure in Flood Zone 1, with isolated areas of Work Nos. 1 to 4 and access to existing National Grid pylons in a pluvial flow pathway, as per EA Flood Risk and Coastal Change Guidance.

## 12.3 Solar PV Area Surface Water Management (Embedded Design)

### Construction Phase

### Pollution Prevention

12.3.0 Given the relatively short construction phase (anticipated to be 24 months) and gently sloping Site, it is not anticipated that significant amounts of sediment will be generated. The Scheme will adhere to a detailed Construction Environmental Management Plan (CEMP - to be provided by the Construction Contractor and based on the **oCEMP [APP/7.6]**), which will ensure compliance with the relevant guidance, such as the archived PPGs, as set out in **ES Appendix 12.1: Consultation and Legislation, Planning Policy and Guidance [APP/6.4]**.

### Run-off Rates

12.3.1 Rural Sustainable Drainage Systems (RSuDS) and Natural Flood Management (NFM) are not new concepts, but they are not widespread in the rural environment and can present many opportunities for improving the management of water at source. They are a collection of physical structures used to mimic natural processes. In rural environments, it is an approach for managing the detrimental impact of rainfall on fields where run-off is a major threat to the flora, fauna and chemical status of our surface waters.

12.3.2 RSuDS and NFM measures slow down or prevent the transport of pollutants to watercourses by breaking the delivery pathway between the pollutant source and the receptor. By intercepting run-off and trapping sediment before it leaves the field they help maintain and manage the provision of good water quality by preventing the loss of soil, chemicals, nutrients, and faecal organisms. A further benefit is their ability to temporarily capture water and slow down flow. This can reduce localised flooding and provide valuable

aquatic habitats in the form of micro-wetlands for farmland wildlife and will encourage the downward movement of water to recharge aquifers.

12.3.3 Research in the United States by Cook & McCuen (2013) outlines that solar panels do not have a significant effect on runoff volumes or peak flows, however where ground beneath panels is bare there may be an increase in peak discharge.

12.3.4 Milazzo et al. (2023) **[Ref. 12-15]** reviews the role of grassland for erosion and flood mitigation in Europe and provides quantification that permanent grassland mitigates better runoff than arable land.

12.3.5 Whilst the Natural England Technical Information Note 101 (TIN101) "*Solar Parks: maximising environmental benefits*" has been archived, the principles relating to solar parks, their siting, their potential impacts and mitigation requirements for the safeguarding of the natural environment are still relevant.

12.3.6 TIN101 states:

*"The key to avoiding increased run-off and soil into watercourses is to maintain soil permeability and vegetative cover. Permeable land surfaces underneath and between panels should be able to absorb rainfall as long as they are not compacted and there is some vegetation to bind the soil surface".*

12.3.7 As such, a suitable grassland sward will be developed in areas underneath the PV arrays before the construction phase.

### PV Array Installation

12.3.8 Whilst the PV arrays and racking system does not involve the installation of hardstanding, the installation methods could lead to soil compaction if not managed properly.

12.3.9 Installation of the racking system (mounting frame) should only occur when soil conditions are suitable e.g. dry enough that tyre imprints are not deeper than a specified depth when tracking across land. The Construction Contractor will be responsible for monitoring conditions, in consultation with the Ecological Clerk of Works, in accordance with a detailed Soil Management Plan which will substantially accord with the submitted **oSRMP [APP/7.13]**, as outlined in paragraphs 4.33 to 4.8.

12.3.10 The mounting framework is likely to be delivered by a vehicle with a trailer and is unlikely to cause soil compaction due to the relatively low wight of the vehicle.

12.3.11 The racking system will then be pile driven into the ground to a depth of typically 1 to 4m, depending on ground conditions using similar tracked mini pile driver machinery, as shown in Plate 12-23.

**Plate 12-23 Mini pile driver examples**



12.3.12 The PV modules are likely to be secured to the racking system by hand and therefore soil compaction is unlikely to occur during this stage, as shown in Plate 12-24.

**Plate 12-24 PV module installation (Ref. 12-16)**

12.3.13 Should vehicles cause compaction during the installation of the PV arrays then this will be ameliorated using typical small-scale horticultural machinery and is outlined in the **oSRMP [APP/7.13]**.

## Operational Phase

12.3.14 RSuDS components from the construction phase (grassland) will remain in place for the operational phase of the Scheme.

12.3.15 The raised nature of Solar PV Arrays will not prevent soil from absorbing rainwater as the panels will not be placed directly on the ground and each PV Row will be separated, with the same area of soil/grassland available for infiltration as per the baseline scenario.

12.3.16 Once rainfall has fallen off a Soar PV Array, the water will be able to spread and flow along the ground under the Solar PV Arrays evenly into the rain-shadow of the row below, so as to mobilise the same percentage of the ground for infiltration as was available prior to the installation of PV Arrays.

12.3.17 The Solar PV Array will comprise rows of solar panel modules mounted on metal frames and pile driven into the ground to limit the footprint of PV array units.

12.3.18 The PV panels would be mounted at least 0.4m from the ground at the lowest point, depending on modelled flood depths, there will be a requirement to raise the leading edge of the Solar PV arrays in some areas.

12.3.19 Installation of the Solar PV arrays does not involve the introduction of hardstanding at ground level meaning the superficial cover for the majority of the Site will remain the same as the baseline.

12.3.20 As the baseline vegetation is arable crops the establishment of grassland will be beneficial in terms of vegetation cover and soil stabilisation, as the land will not be tilled.

12.3.21 Additionally, the PV array tables will have regular rainwater gaps to prevent water being concentrated along a single drip line. As such, rainfall landing on the solar panels will drain through rainwater gaps and infiltrate into the ground beneath and between each row of panels, as shown in Plate 12-25.

**Plate 12-25 Rainwater gaps on PV array table**

12.3.22 Control of run-off from the Solar PV Arrays will be implemented through the land management techniques based upon RSuDS methods that will be implemented before the construction phase, in accordance with the EA's guidance (Ref 12-17) and this will be secured through the **oLEMP [APP/7.11]**.

12.3.23 The limited installation of impermeable surfaces will prevent a substantial increase in surface water run-off.

12.3.24 Grassland beneath the solar panels and between the rows of Solar PV arrays will be established, in accordance with Natural England guidance, as shown in Plate 12-26.

**Plate 12-26 Established grassland and vegetation cover at a Solar Farm**


12.3.25 The exact grass seed mix will be determined following soil testing, prior to the construction phase.

12.3.26 The grassland will be managed through an initial and long-term management plan (as outlined in the **oLEMP [APP/7.11]** and will be secured through the corresponding requirement in the **draft DCO [APP/3.1]**.

12.3.27 The promotion of managed grassland will prevent surface water from the drip line from compacting the ground and therefore limit the potential for rilling and soil mobilisation.

12.3.28 An **oOEMP [APP/7.8]** has been prepared in support of the DCO Application, which will include control measures to ensure no significant impacts will arise during the

maintenance and replacement activities. Maintenance of solar farm equipment and other regular equipment used onsite, such as any operational vehicles, tools and machinery will be carried out by the relevant operational staff. The maintenance will be carried out based on specific guidance and method statements by appropriately trained staff, in line with the required maintenance schedules. This will minimise the risk of compaction of soils and pollution of watercourses.

12.3.29 It should also be noted that large woodland strips will be established along with wildflower meadow, which will be largely outside the fence, as shown on **ES Figure 5.1: Concept Masterplan [APP/6.3]**. These measures will also help to slow surface water before entering the wider hydrological network.

12.3.30 Access tracks will be served by trackside drainage ditches. Along the access tracks, drainage channels on the down-slope would shed track run-off to adjacent rough ground approximately every 30m, to attenuate flow and allow natural filtration to remove sediments. In areas within 50m of a flow or where cross-slopes exceed 1 in 20, drainage channels will be bunded and outflow will be monitored daily in areas with on-going construction activity.

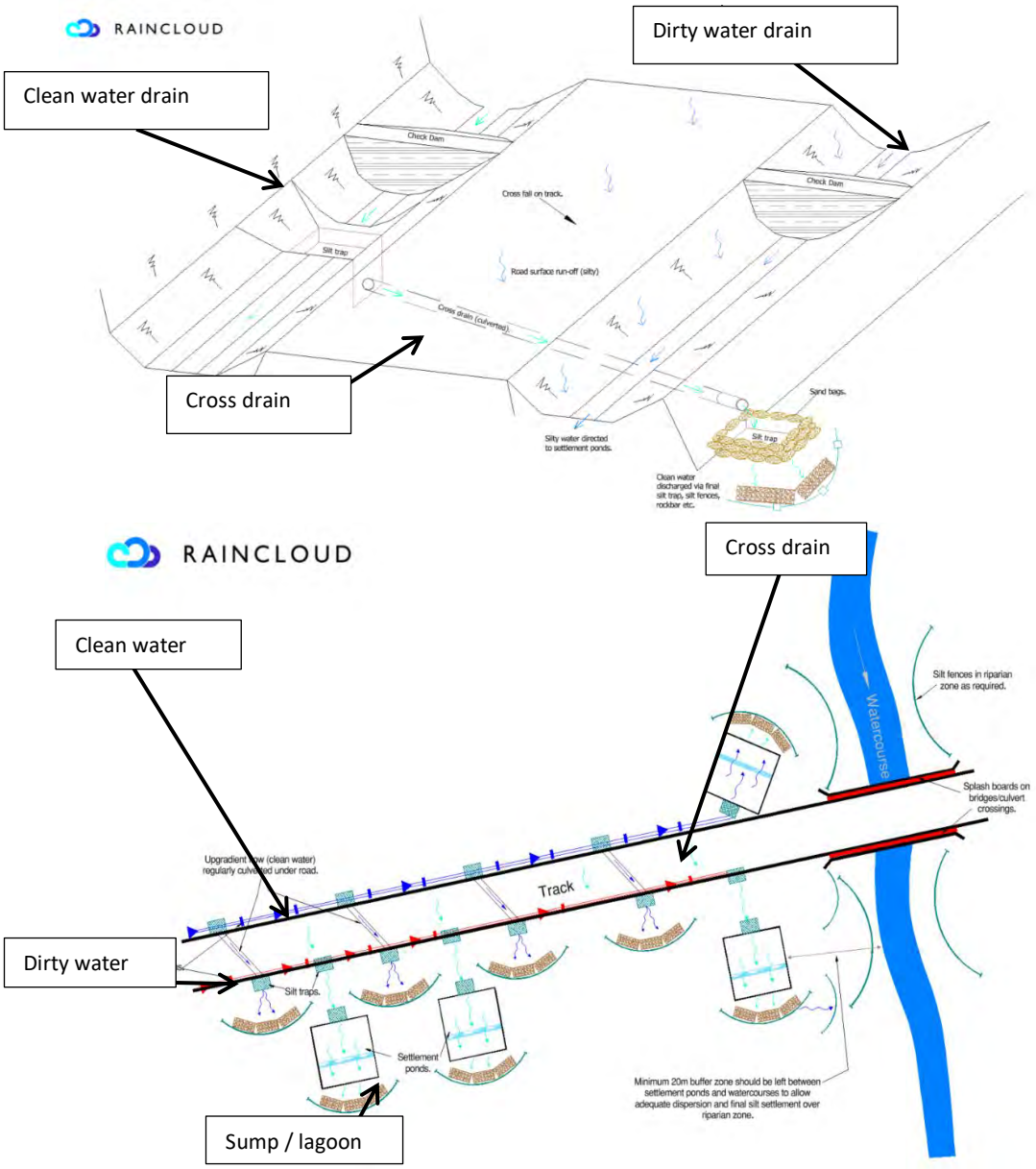
12.3.31 Track surface cross-drains can be installed on tracks with long gradients and limited camber. Measures to ensure hydrological connectivity is maintained between saturated ground and their water source will include the following:

12.3.32 The site drainage design will, where possible, avoid any severance of saturated areas; and

12.3.33 The drainage design will incorporate a drainage ditch on the upslope side of all access tracks to ensure limited crossflow and sediment transport, with regular outfalls to the down-slope side which would shed track runoff to adjacent rough ground or discharge to a settlement lagoon or retention pond if necessary, to control flows and sediment transfer.

12.3.34 An example schematic of the track drainage is shown in Plate 12-27.

**Plate 12-27 Schematic of Track Drainage**




12.3.35 Permanent check dams can also be installed to slow the flow of water in ditches with steeper gradients and straightened channels to prevent erosion of channels. Water within channels should be allowed to flow and should not be stagnant, and tracks should be free from standing water through inclusion of camber or cross-fall.

12.3.36 Sustainable drainage systems such as swales with vegetated channels are preferential and will be designed to intercept, filtrate and convey run-off. Permanent swales and drainage ditches adjacent to access tracks will have outlets at specified intervals to reduce the volume of water collected in a single channel and, therefore, reduce the potential for erosion.

### Steeper Slopes

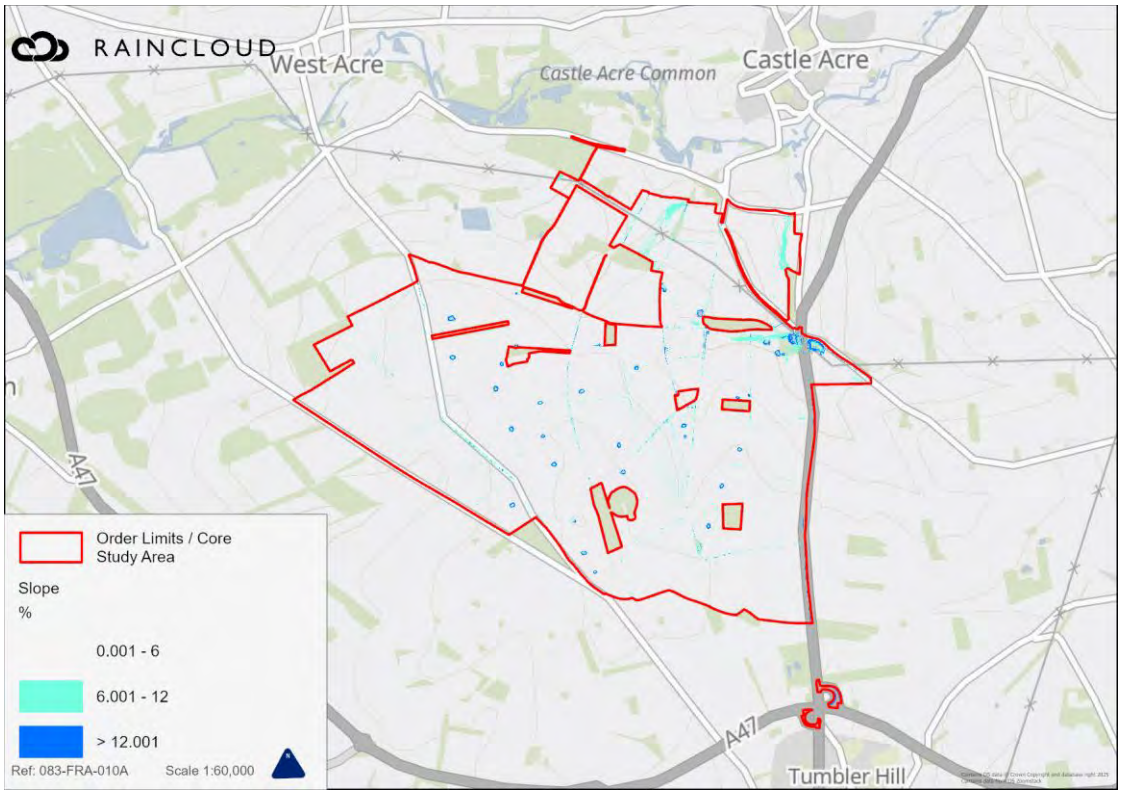
12.3.37 It is reported in Schwyter & Vaughan (Ref 12-18) that the amount of soil erosion is directly related to the amount of surface water run-off, which depends on the water infiltration rate and the percentage of the slope. The steeper the slope and the less rapid the water infiltration rate, the more rapid the water run-off rate for a given soil.

12.3.38 It is noted that most soils will generate rapid or very rapid surface water run-off with slopes between 6 to 12%, regardless of soil type.

12.3.39 The majority of the CSA is located on slopes of less than 6%.

12.3.40 The Solar PV area is mostly shallow sloping with steeper slopes confined to the marl pits and field margins, as shown in Plate 12-28 and at A3 scale as Figure 12-1-10 in Annex E of this FRA.

**Plate 12-28 Slope within CSA**




12.3.41 In areas where PV Arrays run parallel to a slope of 6% or greater or in areas of the Site where concrete feet are used of the Solar PV Mount, active measures such as berms or swales will be considered to slow the flow of surface water run-off as part of construction SuDS, which could be retained for the operational phase of the Scheme.

## 12.4 BESS and Substations Surface Water Management

12.4.0 As discussed with the LLFA in September 2025, the Scheme has Work No.s and does not have a detailed design at this stage, therefore this FRA [APP/6.4] proposes drainage principles which will be secured through the DCO.

12.4.1 This section outlines how the Scheme will be designed to meet the requirements of:

- National Planning Practice Guidance (2014) (as amended 2025 - Paragraph: 023 Reference ID: 7-023-20220825 and Paragraph: 024 Reference ID: 7-024-20220825)
- The NPPF
- The Environment Act (2021)
- Non-Statutory Technical Standards for Sustainable Drainage Systems (2015)
- Environment Agency (EA) - Rural Sustainable Drainage Systems (RSuDS) (Ref 12-17)
- EA - Pollution Prevention Guidelines (PPG) Controlled Burn: PPG28 (archived but still relevant)
- CIRIA - Containment systems for the prevention of pollution. Secondary, tertiary and other measures for industrial and commercial premises (C736)
- National Fire Chiefs Council (NFCC) – Grid Scale Battery Energy Storage System planning – Guidance for FRS
- NFCC – Grid Scale Battery Energy Storage System planning – Guidance for FRS - July 2024 Draft Revision **(**Ref 12-19**)**
- NFPA 855 Standard for the Installation of Stationary Energy Storage Systems **(**Ref 12-6**)**
- Department for Business and Trade - UK Battery Strategy (2023) (Ref 12-20Ref 12-20)
- NCC - Drainage design standards; and
- NCC - Lead Local Flood Authority Statutory Consultee for Planning. Guidance Document (Version 7.1, June 2024).

### Drainage Hierarchy

12.4.2 Infiltration testing was conducted by Rogers Geotechnical Services Ltd. on 6 August 2025 to determine the viability of infiltration. The results provided in Annex B of this FRA shows ‘good’ drainage results and therefore infiltration is considered to be an appropriate drainage strategy for the BESS and substation compound.

12.4.3 A summary of the results from the infiltration testing are provided in Table 12-2.

**Table 12-2: Summary of infiltration results**

| Location | Soil Infiltration rate (m/sec) | Infiltration rate (m/hr) |
|---|---|---|
| TP0 | $3.0 \times 10^{-5} – 1.6 \times 10^{-5}$ | 0.108 - 0.058 |
| TP2 | $2.5 \times 10^{-4} – 9.8 \times 10^{-5}$ | 0.900 – 0.353 |
| TP3 | $2.4 \times 10^{-5} – 1.2 \times 10^{-5}$ | 0.086 – 0.043 |
| TP4 | $3.4 \times 10^{-5} – 2.1 \times 10^{-5}$ | 0.122 – 0.076 |
| TP5 | $1.7 \times 10^{-4} – 1.4 \times 10^{-5}$ | 0.612 – 0.053 |
| TP6 | $1.3 \times 10^{-3} – 6.2 \times 10^{-4}$ | 4.680 – 2.232 |
| TP7 | $1.6 \times 10^{-3} – 1.3 \times 10^{-4}$ | 5.760 – 0.468 |
| TP8 | $1.7 \times 10^{-5} – 1.5 \times 10^{-5}$ | 0.061 – 0.054 |

12.4.4 Further details regarding the drainage system are provided in Section 12.4.

12.4.5 The proposed drainage system layout for the Scheme is provided in Annex C of this FRA.

## Rainfall Data and Climate Change Allowance

12.4.6 Rainfall profiles have been derived from FEH 2022 data.

12.4.7 The BESS and Substation area is located within the North-West Norfolk Management catchment. The Scheme has a lifetime of 60 years and therefore the 2070s epoch has been applied. The 2070s climate change allowance for the 2070s epochs has been provided in **Table 12-3**.

**Table 12-3: North-West Norfolk Management Catchment peak rainfall allowances: 2070s Epoch**

| Return Period | Central Allowance% | Upper End Allowance% |
|---|---|---|
| 3.33% | 20 | 35 |
| 1% | 25 | 40 |

12.4.8 The NCC guidance document for surface water drainage on developments with a lifetime beyond 2100, states ‘the 2070s climate change epoch ‘Upper End’ allowance must be

used in the initial design of any surface water drainage system'. As such, the 40% climate change allowance has been applied to the drainage design criteria.

12.4.9 An Urban Creep allowance has not been applied to calculations as the Scheme is not a residential site i.e. not residential and no further hardstanding areas will be installed during the operational phase.

## Impermeable Area

12.4.10 The maximum potential impermeable areas of the BESS, Customer Substation and National Grid Substation Compounds are shown in Plate 12-29 and at A3 scale as Figure 12-1-12 in Annex E of this FRA. As there is no detailed design, and as a conservative approach, the entirety of Work Nos. 2 to 4 are assumed to be 100% impermeable.

**Plate 12-29 Contributing Catchments and Impermeable Areas**


12.4.11 The BESS, Customer Substation and National Grid Substation Compounds are divided in 2 catchments, as shown in Plate 12-29. A breakdown of each catchment, including the impermeable area and percentage of impermeable area is provided in Table 12-4.

**Table 12-4: Catchment Characteristics**

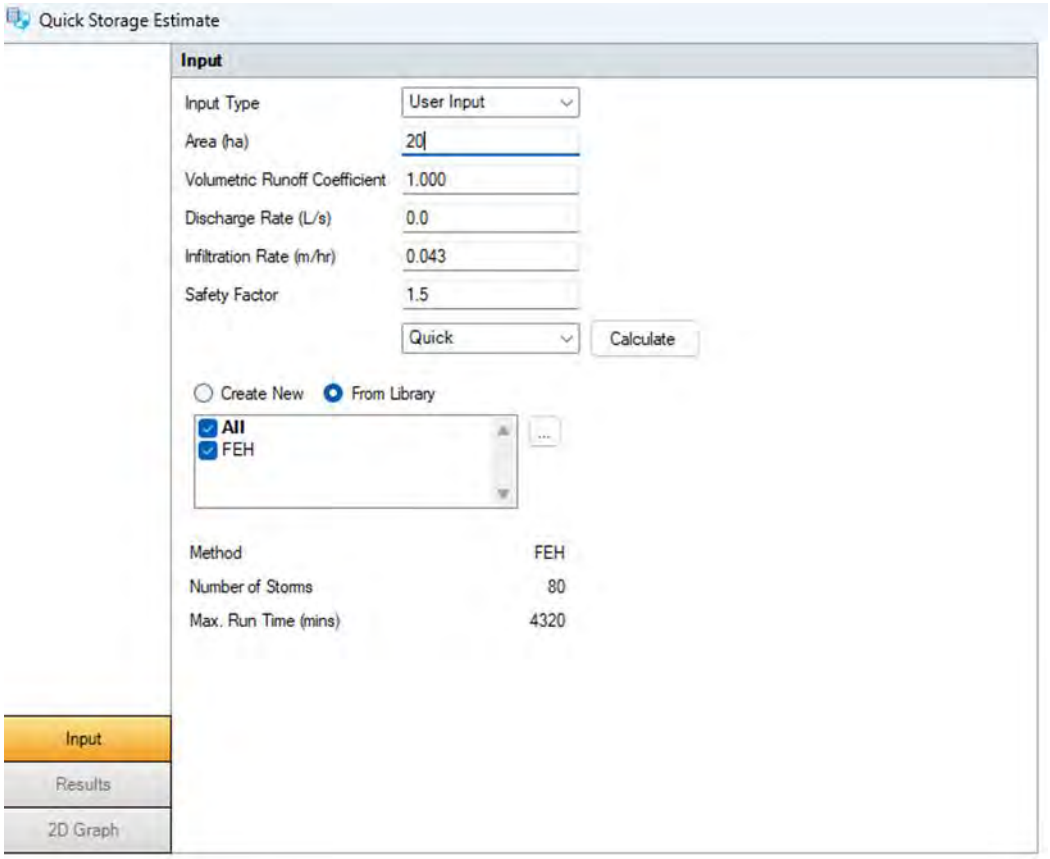
| Catchment | Area (ha) | Impermeable Area (ha) | % Impermeable |
|---|---|---|---|
| 1 | 12 | 12 | 100 |
| 2 | 8 | 8 | 100 |
| **Total** | **20** | **20** | - |

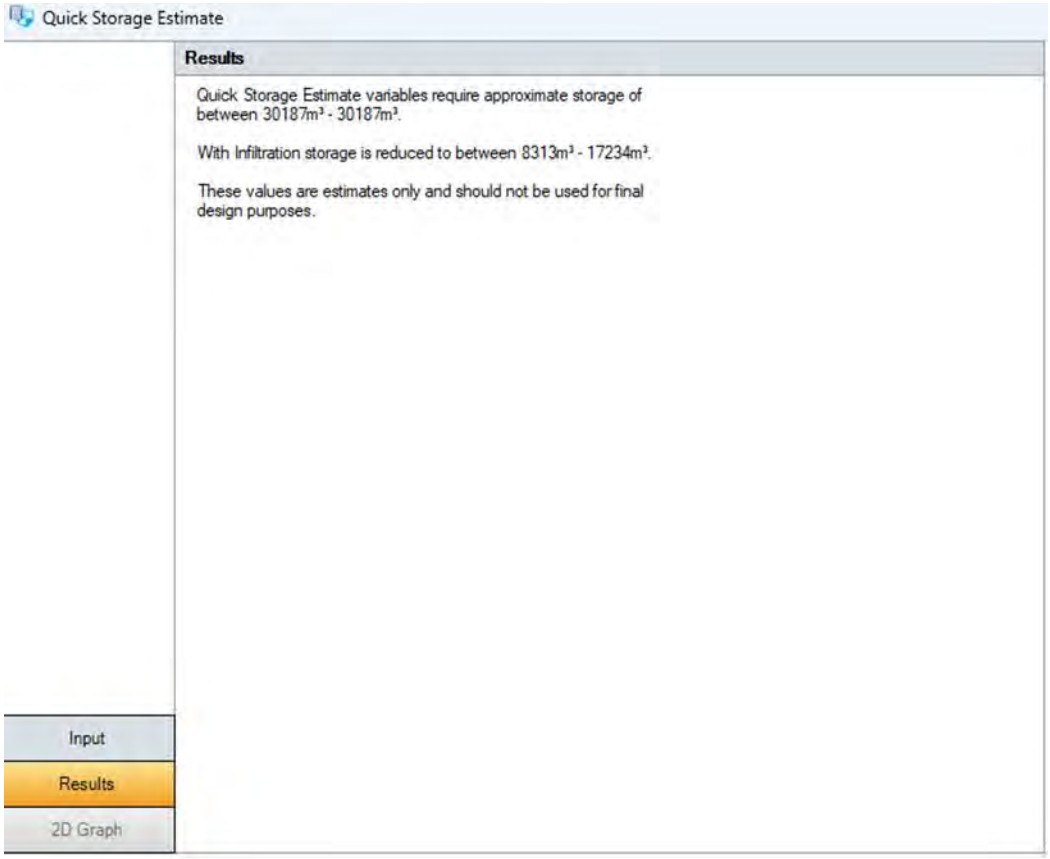
12.4.12 Each catchment has a Cv value of 1.0 as per feedback from the LLFA and Table 2 of the NCC Guidance Document for Surface Water Drainage.

## Quick Storage Estimate

12.4.13 A quick storage estimate for the Site's impermeable area (20 ha) using FEH data and an infiltration rate 0.043m/hr shows the Site requires approximately 30,187m$^3$ however accounting for infiltration, the required storage is reduced to 8,313 – 17,234m$^3$, as shown in Plate 12-30.

**Plate 12-30 InfoDrainage – Quick storage estimates**






12.4.14 InfoDrainage outputs are provided in Annex D of this FRA

## Surface Water Drainage Strategy

12.4.15 No earthworks/levels are available at this stage for the BESS, Customer Substation and National Grid Substation Compounds and, therefore, the levels with the topographical survey have been used within the drainage design. The drainage strategy has been designed in InfoDrainage (version 2026.3).

12.4.16 The BESS and substation compounds drainage design consists of 2 drainage catchments which will connect to manholes via filter drains. Filter drain locations will be confirmed at detailed design stage (i.e. so there is no clash with underground utilities and cables). A pipe network will connect the manholes to a tank. The tank will service as a dual purpose, to provide surface water attenuation for the compound and provide sufficient capacity for fire suppression water in the event of a fire. Further details regarding the tanks use for fire suppression are provided in Section 12.4.

12.4.17 An outline maximum area for the attenuation basin are provided in Annex C.

12.4.18 An automatic penstock will be located on the downstream manhole of the tank to provide a mechanism to stop flow reaching the infiltration basin in the event of a fire. The penstock will prevent potentially contaminated water entering the infiltration basin and ultimately the ground.

12.4.19 All surface water ultimately drains into the infiltration basin via the piped network and tank. The infiltration basin used in the worst-case calculations has a 1.5m depth, base area of 12,000m2 and 14,500m2, side slope 1:4 and a volume 19,845m3. An outline maximum area for the infiltration basin area provided in Annex C of this FRA.

## Results – Critical Return Period

12.4.20 The Critical Return Period for the design event, 1% AEP event +40% CC allowance, is the 960-minute summer event. The maximum depth within the infiltration basin is shown to be 1.457 m. The Critical Return Period result is shown in Plate 12-31. Full results are provided in Annex D of this FRA.

**Plate 12-31 InfoDrainage Critical Return Period Results**

Critical Storm Per Item

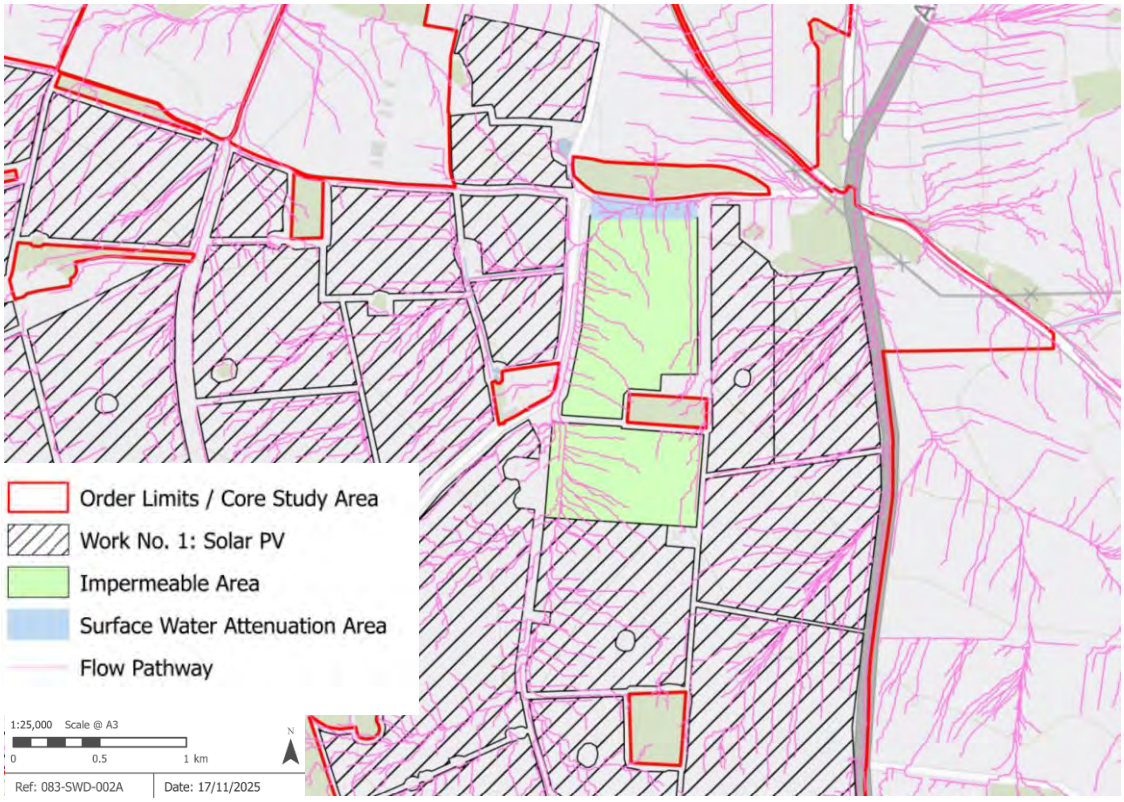
| Stormwater Control | Storm Event | Max. US Level (m) | Max. DS Level (m) | Max. US Depth (m) | Max. DS Depth (m) | Max. Inflow (L/s) | Max. Resident Volume (m³) | Max. Flooded Volume (m³) | Total Lost Volume (m³) | Max. Outflow (L/s) | Total Discharge Volume (m³) | Half Drain Down Time (mins) | Percentage Available (%) | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pond | FEH: 100 years: +40 %: 960 mins: Winter | 51.457 | 51.457 | 1.457 | 1.457 | 1094.6 | 19230.223 | 0.000 | 12244.188 | 0.0 | 0.000 | | 3 | OK |

12.4.21 The previous more conservative design for the infiltration basin had a half drain time for the critical storm event is 1,531 minutes. It is expected that the current design will have a similar half drain time. The most conservative infiltration rate has been used, and it is assumed that all the work areas are 100% impermeable. This conservative approach is likely to overestimate the half drain time required for the final drainage system as part of the detailed design of the Scheme. Detailed design will confirm that the Work areas will not be 100% impervious, and half drain time will likely be less than 24 hours.

## Overland and Exceedance Flows

12.4.22 The SuDS system has been designed to accommodate the 1% AEP +40% CC allowance event and therefore should the designed storm be exceeded then flows could be as per the natural typography to the north of the BESS and Substation Compounds, as shown in Plate 12-32 and at an A3 scale as Figure 12-1-13 in Annex E of this FRA.

**Plate 12-32 Exceedance Flow Pathways**




12.4.23 None of the Scheme infrastructure or third-party property exists within the exceedance flow pathway.

## The Simple Index Approach (SIA) Tool

12.4.24 As the operational phase of the Scheme will involve occasional maintenance visits and will involve significantly less than 300 traffic movements per day (as per the SIA guidance), Table 26.2 Pollution hazard indices for different land use classifications of the SuDS Manual identifies that the Scheme has a Pollution Hazard Level of Low, 'non-residential car parking with infrequent change (e.g., schools, offices) i.e., < 300 traffic movements/day', equating to a Land Use Pollution Index of 0.5 (SS), 0.4 (metals) and 0.4 (hydrocarbons).

12.4.25 A SIA has been developed on behalf of the EA (and other Regulators such as SEPA) to support the implementation of the water quality management design methods set out in the SuDS Manual, with appropriate cross-referencing to the relevant 'Design Conditions' in the tool.

12.4.26 The semi permeable/porous road and an infiltration basin will be sufficient to effectively mitigate any suspended solids, metals and hydrocarbons held within surface water at the Scheme prior to discharging into the unnamed watercourse outside the Site, as the Aggregated Pollution Mitigation Indices for the run-off area are 0.85 (SS), 0.8 (metals) and 0.95 (hydrocarbons).

12.4.27 As such, the treatment of the surface water run-off will meet the minimum requirements of the pollution mitigation indices outlined in the SIA Tool.

## Responsibilities and Long-Term Management

12.4.28 In the rare event of a battery unit fire the NFCC guidance recommends the ability to capture firewater and not have uncontained releases to the hydrological environment.

12.4.29 A drainage option which will utilise a piped network to drain the BESS Compound and Customer and National Grid Substations to a contaminated water tank, prior to draining to an infiltration basin is proposed as a way of attenuating the increase in surface water run-off rates at the Scheme.

12.4.30 SuDS features will incorporate a 3.5m wide access or buffer strip for vehicles to access the future for maintenance.

12.4.31 It will be the responsibility of the Scheme operator to maintain effective drainage measures and rectify drainage measures that are not functioning adequately. A nominated person will also have responsibility for reporting on the functionality of drainage measures.

12.4.32 Where areas remain positively drained through the lifetime of the Scheme, the SuDS measures serving these areas will be checked on a regular basis. Should drainage measures require dredging or unblocking, this will be undertaken as soon as practicable.

12.4.33 A maintenance scheme for all drainage infrastructure will be agreed with the LLFA prior to the construction phase commencing and is secured in Section 2.14 of the **oOEMP [APP/7.8]**.

## Fire Suppression

### Procedure

12.4.34 In the rare event of a battery fire, the procedure will be outlined in the **oBSMP [APP/7.14]**.

12.4.35 The Scheme operator will follow the accepted strategy of allowing a battery related fire to self-consume, reducing unnecessary risk of injury to site and firefighting personnel.

12.4.36 Should a fire occur, the effected enclosure will be allowed to self-consume until the fire is extinguished through consumption of the combustible materials within the battery container/enclosure. The firefighting procedure will be to apply water for fire suppression to adjacent BESS enclosures as a way of reducing the temperature of the adjacent containers.

12.4.37 As water will not be directly applied to affected BESS container, there is reduced potential for suppression water to become contaminated.

### Fire Suppressant Volume

12.4.38 Based on recommendations in NFPA 855 Standard for the Installation of Stationary Energy Storage Systems and NFCC – Grid Scale Battery Energy Storage System planning – Guidance for FRS, a burn time of 2 hours and a requirement of 1,900l/min of fire suppression water has been used to calculate the volume of fire suppressant water required to be stored onsite in the event of a container fire.

12.4.39 This equates to 228m$^3$ of storage.

12.4.40 The SuDS structures serving the BESS compound will be sized to accommodate the 1% AEP +40% CC and an additional 228m$^3$, and this will be sufficient for storing the full fire suppressant volume during an extreme rainfall event.

12.4.41 A penstock, linked to an automated system, will be placed on the manhole downstream of the contaminated water tank(s) and would be shut off in the event of a fire suppression event. This will isolate the system and prevent potentially contaminated water from reaching the infiltration basin(s) and therefore limit the potential for contaminants to enter the hydrogeological environment.

12.4.42 It would remain closed until testing of the captured water has taken place. Water will then either be removed offsite by tankers to a licenced facility or discharged to the unnamed field drain (subject to agreement with the EA).

12.4.43 It is recommended that the BESS Compound has a shallow bund or cut-off permitter drain to limit the potential for run-off to leave the Scheme and drain to the contaminated water tank.

12.4.44 As per discussions with the EA a programme of regular maintenance and testing of the penstocks is incorporated and secured as part of Table 37 of the **oOEMP [APP/7.8]**.

## 12.5 Ancillary infrastructure

12.5.0 Inverters and conversion units will incorporate a clean aggregate surround which will promote infiltration and will be calculated to store the 1 % AEP +40% CC event within the void space.

12.5.1 An example conversion unit surround is shown in Plate 12-33.

**Plate 12-33 Conversion unit gravel surround**


## 12.6 Conclusion & Recommendations

12.6.0 The Order limits are mostly located in Flood Zone 1 (99.5%), while 0.5% lies in Flood Zone 2 and Flood Zone 3, associated with land for skylark mitigation. The Scheme is located outside the 1% AEP +20% CC and the 0.1% AEP modelled flood outlines for the River Nar.

12.6.1 The Scheme is classified as Essential Infrastructure and is therefore compatible with Flood Zones 1, 2 and 3.

12.6.2 Groundwater levels are likely to be variable across the CSA and was struck at 40m BGL within a borehole adjacent to the western boundary of the CSA.

12.6.3 2D rainfall modelling has identified two shallow depth pluvial flow pathways in the east of the CSA. BESS units will not be flush to the ground and will be elevated from the ground by approximately 300mm. As such the Scheme will remain safe and operational should pluvial flooding occur.

12.6.4 Surface water runoff from the Solar PV will be managed through RSuDS and NFM techniques such as grassland/wildflower, which will act to bind soils, slow surface water and increase water quality compared to the baseline scenario.

12.6.5 Tidal and reservoir flooding were scoped out of the assessment, as agreed with the EA and PINS.

12.6.6 The Scheme is compliant with the NPS EN-1, NPS EN-3, NPS EN-5, NPPF and local planning policy, including Policy ENV09 Flood Risk & Surface Water Drainage of the Adopted Local Plan.

# References

Ref 12-1 EA Climate Change Allowances: Peak River Flow https://environment-test.data.gov.uk/hydrology/climate-change-allowances/river-flow?mgmtcatid=3065

Ref 12-2 National Policy Statement (NPS) for energy (EN-1) (2024) https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1

Ref 12-3 National Policy Statement (NPS) for renewable energy infrastructure (EN-3) (2024) https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3

Ref 12-4 National Policy Statement for electricity networks infrastructure (EN-5) (2024) https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5

Ref 12-5 National Fire Chiefs Council https://nfcc.org.uk/

Ref 12-6 NFPA 855 – Standard for the Installation of Stationary Energy Storage Systems (2026) https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=855

Ref 12-7 EA Asset Managementhttps://environment.data.gov.uk/asset-management/index.html

Ref 12-8 EA Climate Change Allowances: Peak Rainfallhttps://environment-test.data.gov.uk/hydrology/climate-change-allowances/rainfall?mgmtcatid=3052

Ref 12-9 Monte Carlo approach used to derive the national default 12 mm per hour drainage rate value disapplied due to rural catchment

Ref 12-10 Manning's n for Channels (Chow, 1959)

Ref 12-11 Risk of flooding from surface water – understanding and using the map (2025) https://assets.publishing.service.gov.uk/media/5db6ded540f0b6379a7acbb8/What-is-the-Risk-of-Flooding-from-Surface-Water-Map.pdf

Ref 12-12 National Planning Policy Framework Annex 3: Flood risk vulnerability classification (2012) https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerabilityclassification#:~:text=nature%20conservation%20and%20biodiversity

Ref 12-13 Check your long term flood risk Web Application https://check-long-term-flood-risk.service.gov.uk/risk

Ref 12-14 Flood risk and coastal change guidance (2025) https://www.gov.uk/guidance/flood-risk-and-coastal-change#the-sequential-approach-to-the-location-of-development:~:text=In%20applying%20paragraph,not%20be%20applied.

Ref 12-15 The role of grassland for erosion and flood mitigation in Europe: A meta-analysis. Agriculture, Ecosystems & Environment Volume 348, 1 June 2023, 108443 https://doi.org/10.1016/j.agee.2023.108443

Ref 12-16 Keele University

Ref 12-17 Environment Agency, 2012. Rural Sustainable Drainage Systems (RSuDS). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291508/scho0612buwh-e-e.pdf

Ref 12-18 Schwyter, A., Vaughan, K. (2020) Introduction to Soil Science Laboratory Manual, University of Wyoming Libraries https://batch.libretexts.org/print/Letter/Finished/geo-14422/Full.pdf

Ref 12-19 Draft Guidance on Grid Scale Battery Energy Storage Systems (BESS) (2024) https://nfcc.org.uk/consultation/draft-grid-scale-energy-storage-system-planning-guidance/

Ref 12-20 UK Battery Strategy (2023) https://www.gov.uk/government/publications/uk-battery-strategy

# Annex A: EA Data

| | |
|---|---|
| **From:** | Enquiries_EastAnglia |
| **To:** | Liam Nevins |
| **Subject:** | EAN/2024/374708 - Response for your auto Product 4 request for 580518,313637 - Swaffham - PE322AD Your ref: BKNTRYRDFF62 |
| **Date:** | 25 September 2024 14:48:44 |
| **Attachments:** | BKNTRYRDFF62.pdf<br>FRA advisory note.pdf<br>East_Anglian_External Climate Change Allowances Guidance_March2022.pdf |

Dear Liam,

**Enquiry regarding Product 4 request for 580518,313637 - Swaffham - PE322AD**

Thank you for your enquiry which was received on 02 September 2024.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

The area selected for the auto Product 4 is slightly too large. Therefore, we have provided you with the product 5, 6 and 7 for the model associated with this area in addition.

**Product 4:**
Please find the information requested for Product 4 attached in the PDF titled: BKNTRYRDFF62

If you have any comments regarding the attached letter please contact our Partnership & Strategic Overview team directly by email at pso.eastanglia@environment-agency.gov.uk

**Products 5,6 & 7:**
The information we hold has been uploaded to our sharefile system and can be accessed using the following link:

https://ea.sharefile.com/public/share/web-s50f94d98144643a8a60eccc8a8b343ee

Please note the above link will expire on: 20/12/2024

A copy of the Flood Risk Assessment (FRA) advisory note is attached to my email.

Further Asset Management Data and Information can be found online using this link: https://environment.data.gov.uk/asset-management/index.html

| | |
|---|---|
| Name | Product 4 |
| Description | Detailed Flood Risk Assessment Map for 580518,313637 - |

| | |
|---|---|
| | Swaffham - PE322AD |
| Licence | Open Government Licence |
| Information Warnings | The maps provided are to be used in conjunction with the **Datasheet**. Please read the Datasheet and take note of information contained within the **'Important Information'** section. |
| Information Warning - OS background mapping | *The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.* |
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**Abstract**

| | |
|---|---|
| Name | Products 5, 6 and 7 |
| Description | **Upper River Nar MP7**<br>Product 5 – Eastern Rivers Modelling Report: River Nar, July 2015, JBA Consulting.<br><br>Product 6 – Output data of Eastern Rivers Modelling: Upper River Nar, MP7, July 2015, JBA Consulting.<br><br>Product 7 – Calibrated and Verified Model Input data of Eastern Rivers Modelling: Upper River Nar, MP7, July 2015, JBA Consulting. |
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| | |

| | |
|---|---|
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|---|---|
| | purposes or to use it in any way as part of Environment Agency derivative products which it supplies free of charge to others such as incorporation into the Environment Agency's Open Data mapping products. |
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**Coastal Modelling**

You may be aware that some Local Planning Authorities have updated their Strategic Flood Risk Assessments (SFRAs) using data from this modelling study. As SFRA's are not updated regularly we agreed that they could use draft outputs as we wanted to ensure that the SFRA's were not out of date as soon as they were published.

**If you are using our 2018 Coastal Flood Modelling Data outputs: Please refer to page 13 of the Product 4 supporting document.**

**Data Available Online**

Many of our flood datasets are available online:

- Flood Map For Planning (Flood Zone 2, Flood Zone 3 ,Flood Storage Areas, Flood Defences, Areas Benefiting from Defences,)
- Risk of Flooding from Rivers and Sea
- Historic Flood Map
- Current Flood Warnings

**What's In Your BackYard (WIYBY) is no longer available.**

Most of the data is still available via other sharing services such as DATA.GOV.UK, MAGIC map and new GOV.UK digital services. Where the datasets are no longer available as maps, you will be able to download and use within specialist applications.

To find out all the services the Environment Agency have available, please click here.

For any other enquiries please send your request to us at:
Enquiries_EastAnglia@environment-agency.gov.uk.

Additional information

Please be aware that we now charge for planning advice provided to developers, agents and landowners. If you would like advice to inform a future planning application for this site then please complete our https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion and email it to our Sustainable Places team. planning.eastanglia@environment-agency.gov.uk. They will initially provide you with a free response identifying the following:

- the environmental constraints affecting the proposal;
- the environmental issues raised by the proposal;
- the information we need for the subsequent planning application to address the issues identified and demonstrate an acceptable development;
- any required environmental permits.

If you require any further information from them (for example, a meeting or the detailed review of a technical document) they will need to set up a charging agreement. Further information can be found on our website.

**Climate Change Allowances**

For information on the use climate change allowances in Flood Risk Assessments, please see the attached document - **East_Anglian_External Climate Change Allowances Guidance_March2022.pdf**.

The guidance provides climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height. The guidance provides a range of allowances to assess fluvial flooding, which varies depending on which management catchment a site lies within. It advises on which allowances to use for assessing the impact of climate change on fluvial flood risk based on vulnerability classification, flood zone and development lifetime.

If you want to discuss this please call our Sustainable Places team on 020 8474 5242 (West).

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Kind regards,

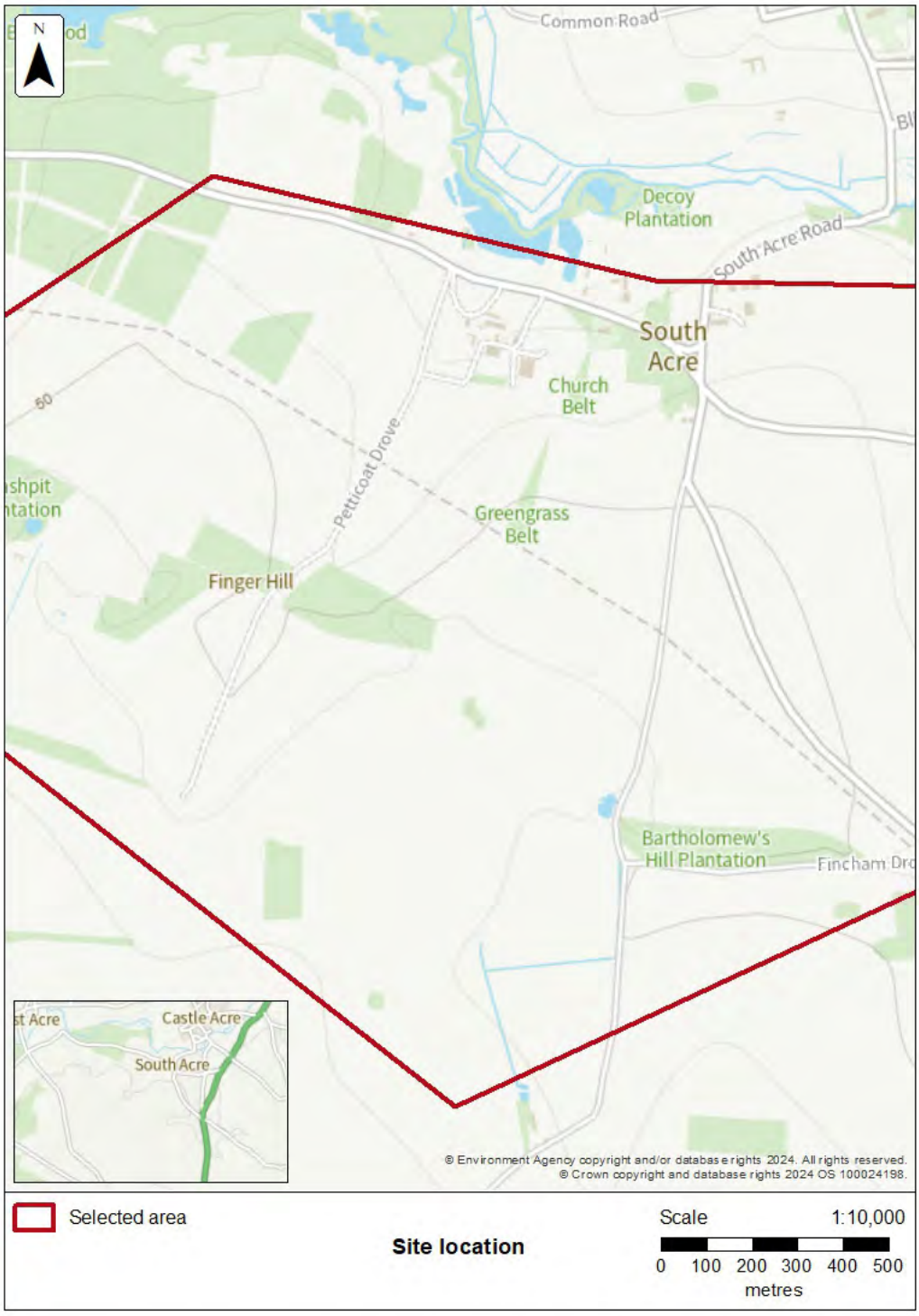
**Katie Livens**
**Customers & Engagement Officer**
Customers & Engagement Team, East Anglia Area
Environment Agency
**Environment Agency** | Iceni House, Cobham Road, Ipswich IP3 9JD

**Environment Agency** | Bromholme Lane, Brampton, Huntingdon, Cambridgeshire, PE28 4NE

# Flood risk assessment data

**Location of site:** 580678 / 313731 (shown as easting and northing coordinates)
**Document created on:** 2 September 2024
**This information was previously known as a product 4.**
**Customer reference number:** BKNTRYRDFF62

Map showing the location that flood risk assessment data has been requested for.



## How to use this information

You can use this information as part of a flood risk assessment for a planning application. To do this, you should include it in the appendix of your flood risk assessment.

> **We recommend that you work with a flood risk consultant to get your flood risk assessment.**

## Included in this document

In this document you'll find:

- how to find information about surface water and other sources of flooding
- information on the models used
- definitions for the terminology used throughout
- flood map for planning (rivers and the sea)
- modelled data
- climate change modelled data
- information about strategic flood risk assessments
- information about this data
- information about flood risk activity permits
- help and advice

## Information that's unavailable

This document **does not** contain:

- historic flooding
- flood defences and attributes

We do not have historic flooding data for this location.

Please note that:

- flooding may have occurred that we do not have records for
- flooding can come from a range of different sources
- we can only supply flood risk data relating to floodng from rivers or the sea

You can contact your Lead Local Flood Authority or Internal Drainage Board to see if they have other relevant local flood information. Please note that some areas do not have an Internal Drainage Board.

We aren't able to display flood defence locations and attributes as there are no formal flood defences in the area of interest.

## Surface water and other sources of flooding

Use the long term flood risk service to find out about the risk of flooding from:

- surface water
- ordinary watercourses
- reservoirs

Or you can contact your Lead Local Flood Authority for further information.

Your Lead Local Flood Authority is Breckland.

For information about sewer flooding, contact the relevant water company for the area.

## About the models used

Model name: EAn_EasternRivers_UpperNar_MP7_2015
Scenario(s): Defended fluvial, defended climate change fluvial
Date: 1 November 2015

This model contains the most relevant data for your area of interest.

## Terminology used

### Annual exceedance probability (AEP)

This refers to the probability of a flood event occurring in any year. The probability is expressed as a percentage. For example, a large flood which is calculated to have a 1% chance of occuring in any one year, is described as 1% AEP.

### Metres above ordnance datum (mAOD)

All flood levels are given in metres above ordnance datum which is defined as the mean sea level at Newlyn, Cornwall.

## Flood map for planning (rivers and the sea)

Your selected location is in flood zone 3.

Flood zone 3 shows the area at risk of flooding for an undefended flood event with a:

- 0.5% or greater probability of occurring in any year for flooding from the sea
- 1% or greater probability of occurring in any year for fluvial (river) flooding

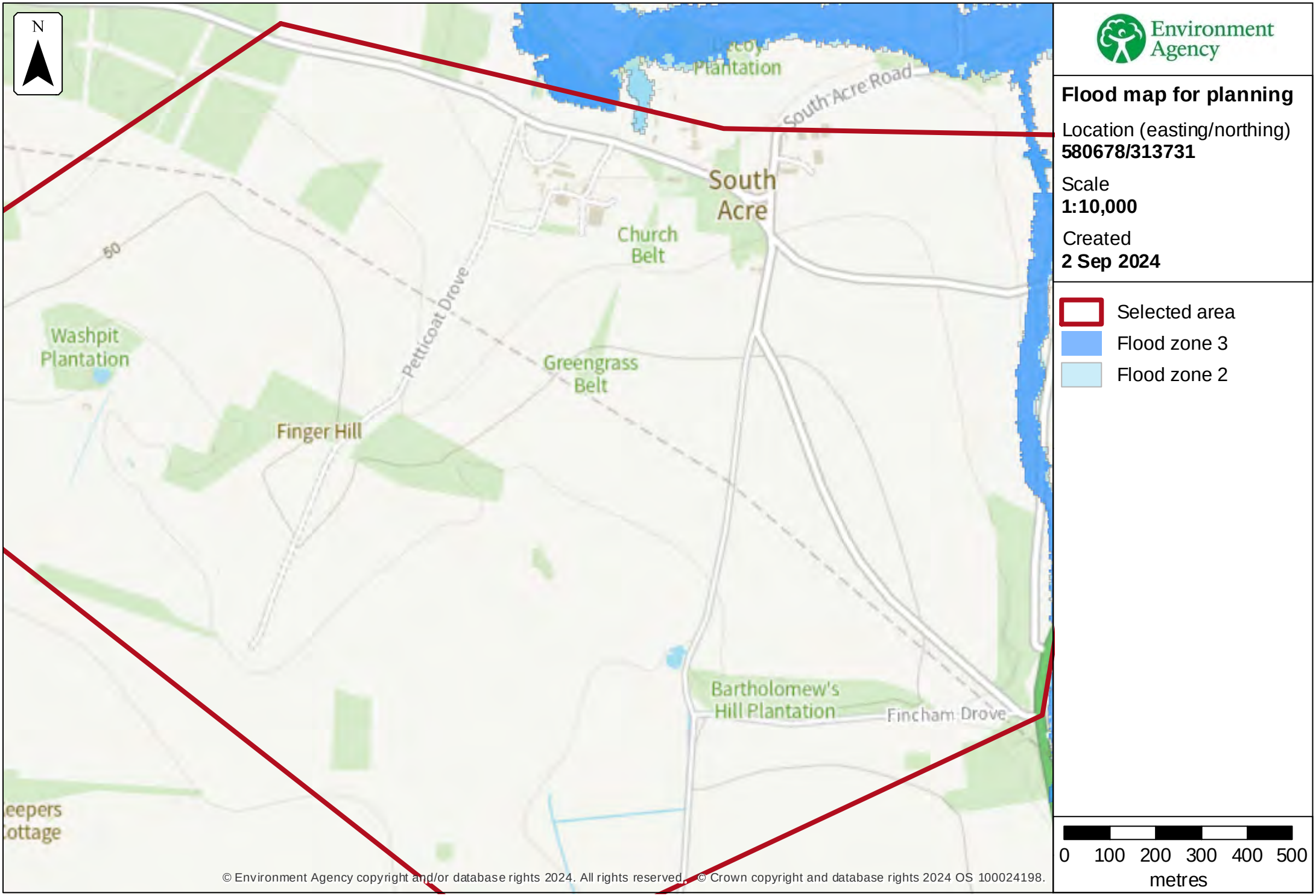
Flood zone 2 shows the area at risk of flooding for an undefended flood event with:

- between a 0.1% and 0.5% probability of occurring in any year for flooding from the sea
- between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding

It's important to remember that the flood zones on this map:

- refer to the land at risk of flooding and do not refer to individual properties
- refer to the probability of river and sea flooding, ignoring the presence of defences
- do not take into account potential impacts of climate change

The flood zones are not currently being updated. The last update was in November 2023. Some of the flood zones may have changed, however all source data is included in the models below.


N
Environment Agency
Flood map for planning
Location (easting/northing)
580678/313731
Scale
1:10,000
Created
2 Sep 2024
Selected area
Flood zone 3
Flood zone 2
South Acre Road
South Acre
Church Belt
Petticoat Drove
Washpit Plantation
Greengrass Belt
Finger Hill
Bartholomew's Hill Plantation
Fincham Drove
50
0 100 200 300 400 500
metres
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# Modelled data

This section provides details of different scenarios we have modelled and includes the following (where available):

- outline maps showing the area at risk from flooding in different modelled scenarios
- map(s) showing the approximate water levels for the return period with the largest flood extent for a scenario and table(s) of sample points providing details of the flood risk for different return periods

## Climate change

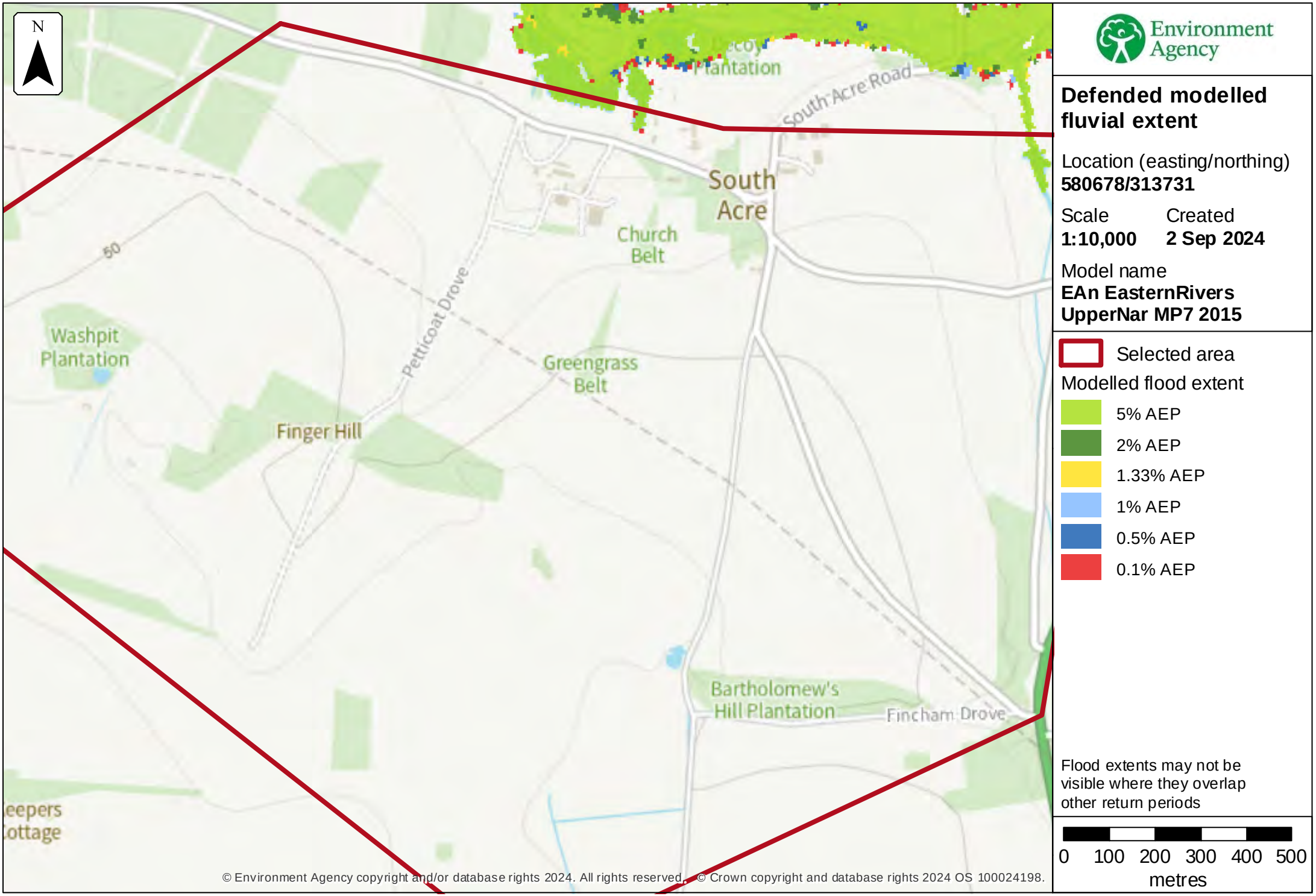
The climate change data included in the models may not include the latest flood risk assessment climate change allowances. Where the new allowances are not available you will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

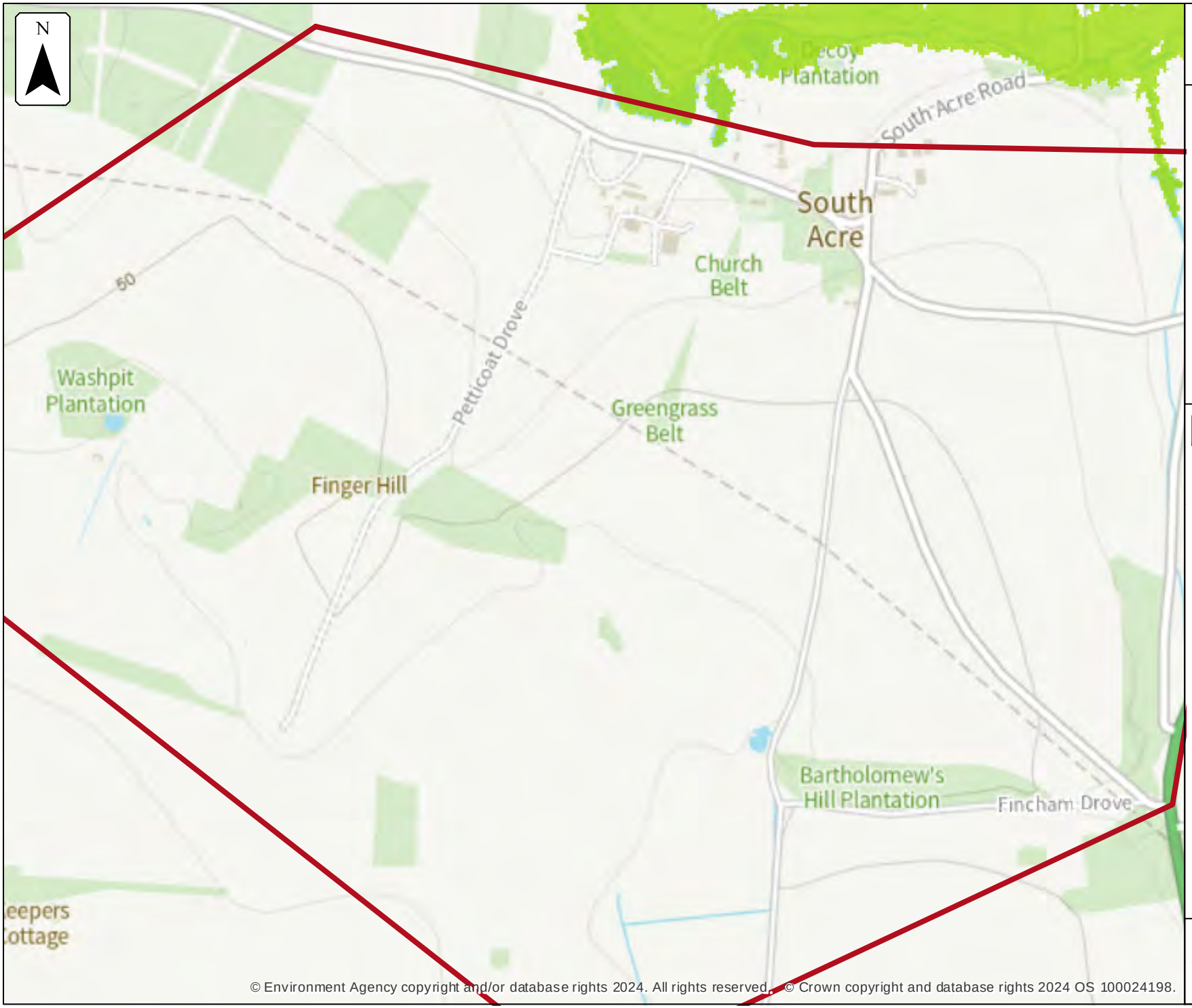
The Environment Agency will incorporate the new allowances into future modelling studies. For now, it's your responsibility to demonstrate that new developments will be safe in flood risk terms for their lifetime.

## Modelled scenarios

The following scenarios are included:

- Defended modelled fluvial: risk of flooding from rivers where there are flood defences
- Defended climate change modelled fluvial: risk of flooding from rivers where there are flood defences, including estimated impact of climate change


N
South Acre Road
South Acre
Church Belt
Petticoat Drove
Washpit Plantation
Greengrass Belt
Finger Hill
Bartholomew's Hill Plantation
Fincham Drove
50
eepers ottage
Environment Agency
Defended modelled fluvial extent
Location (easting/northing)
580678/313731
Scale
1:10,000
Created
2 Sep 2024
Model name
EAn EasternRivers UpperNar MP7 2015
Selected area
Modelled flood extent
5% AEP
2% AEP
1.33% AEP
1% AEP
0.5% AEP
0.1% AEP
Flood extents may not be visible where they overlap other return periods
0 100 200 300 400 500
metres
© Environment Agency copyright and/or database rights 2024. All rights reserved. © Crown copyright and database rights 2024 OS 100024198.




Environment Agency

**Defended climate change modelled fluvial extent**

Location (easting/northing)
**580678/313731**

Scale
**1:10,000**

Created
**2 Sep 2024**

Model name
**EAn EasternRivers UpperNar MP7 2015**

Selected area

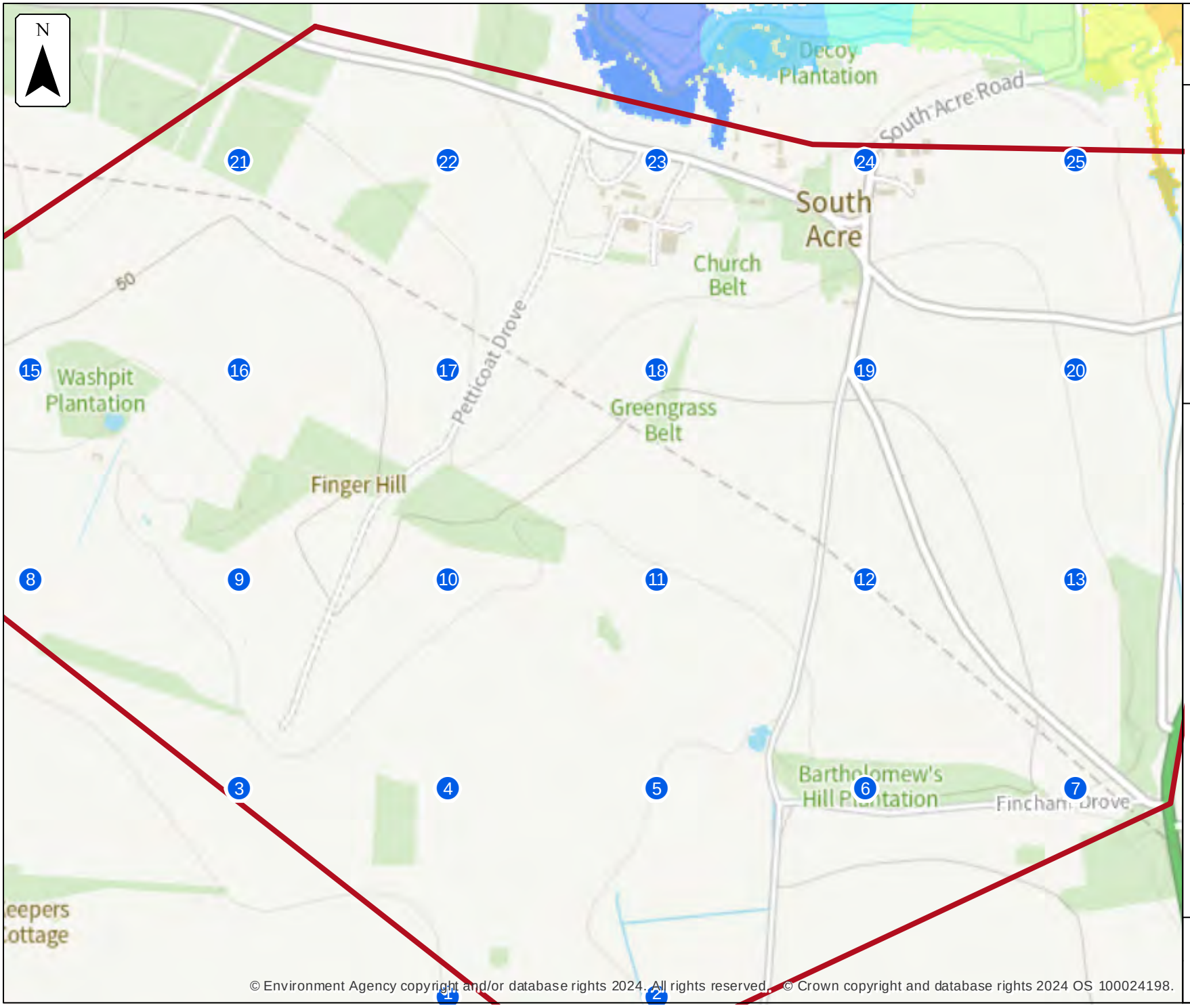
Main river

Modelled flood extent

1.0% AEP (+20%)

Flood extents may not be visible where they overlap other return periods

0 100 200 300 400 500
metres




Environment Agency

**Defended modelled fluvial extent and height**

Location (easting/northing)
**580678/313731**

Scale
**1:10,000**

Created
**2 Sep 2024**

Model name
**EAn EasternRivers UpperNar MP7 2015**

Selected area

Main river

Modelled 2D grid
*Water level in mAOD*

- 0 - 25.0
- 25.0 - 25.375
- 25.375 - 25.75
- 25.75 - 26.125
- 26.125 - 26.5
- 26.5 - 26.875
- 26.875 - 27.25
- 27.25 - 27.625
- 27.625 - 28.0

This map shows the 0.1% AEP height data

0 100 200 300 400 500
metres

# Sample point data

## Defended

| Label | Easting | Northing | 5% AEP | 2% AEP | 1.33% AEP | 1% AEP | 0.5% AEP | 0.1% AEP |
|---|---|---|---|---|---|---|---|---|
| | | | Depth | Depth | Depth | Depth | Depth | Depth |
| 1 | 580395 | 312767 | NoData | NoData | NoData | NoData | NoData | NoData |
| 2 | 580803 | 312767 | NoData | NoData | NoData | NoData | NoData | NoData |
| 3 | 579987 | 313175 | NoData | NoData | NoData | NoData | NoData | NoData |
| 4 | 580395 | 313175 | NoData | NoData | NoData | NoData | NoData | NoData |
| 5 | 580803 | 313175 | NoData | NoData | NoData | NoData | NoData | NoData |
| 6 | 581211 | 313175 | NoData | NoData | NoData | NoData | NoData | NoData |
| 7 | 581619 | 313175 | NoData | NoData | NoData | NoData | NoData | NoData |
| 8 | 579579 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 9 | 579987 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 10 | 580395 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 11 | 580803 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 12 | 581211 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 13 | 581619 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 14 | 579171 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 15 | 579579 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 16 | 579987 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |

| Label | Easting | Northing | 5% AEP | 2% AEP | 1.33% AEP | 1% AEP | 0.5% AEP | 0.1% AEP |
|---|---|---|---|---|---|---|---|---|
| | | | Depth | Depth | Depth | Depth | Depth | Depth |
| 17 | 580395 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 18 | 580803 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 19 | 581211 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 20 | 581619 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 21 | 579987 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| 22 | 580395 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| 23 | 580803 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| 24 | 581211 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| 25 | 581619 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| 26 | 582027 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| Max value in selected area: | | | 0.89 | 0.95 | 0.97 | 0.99 | 1.04 | 1.16 |

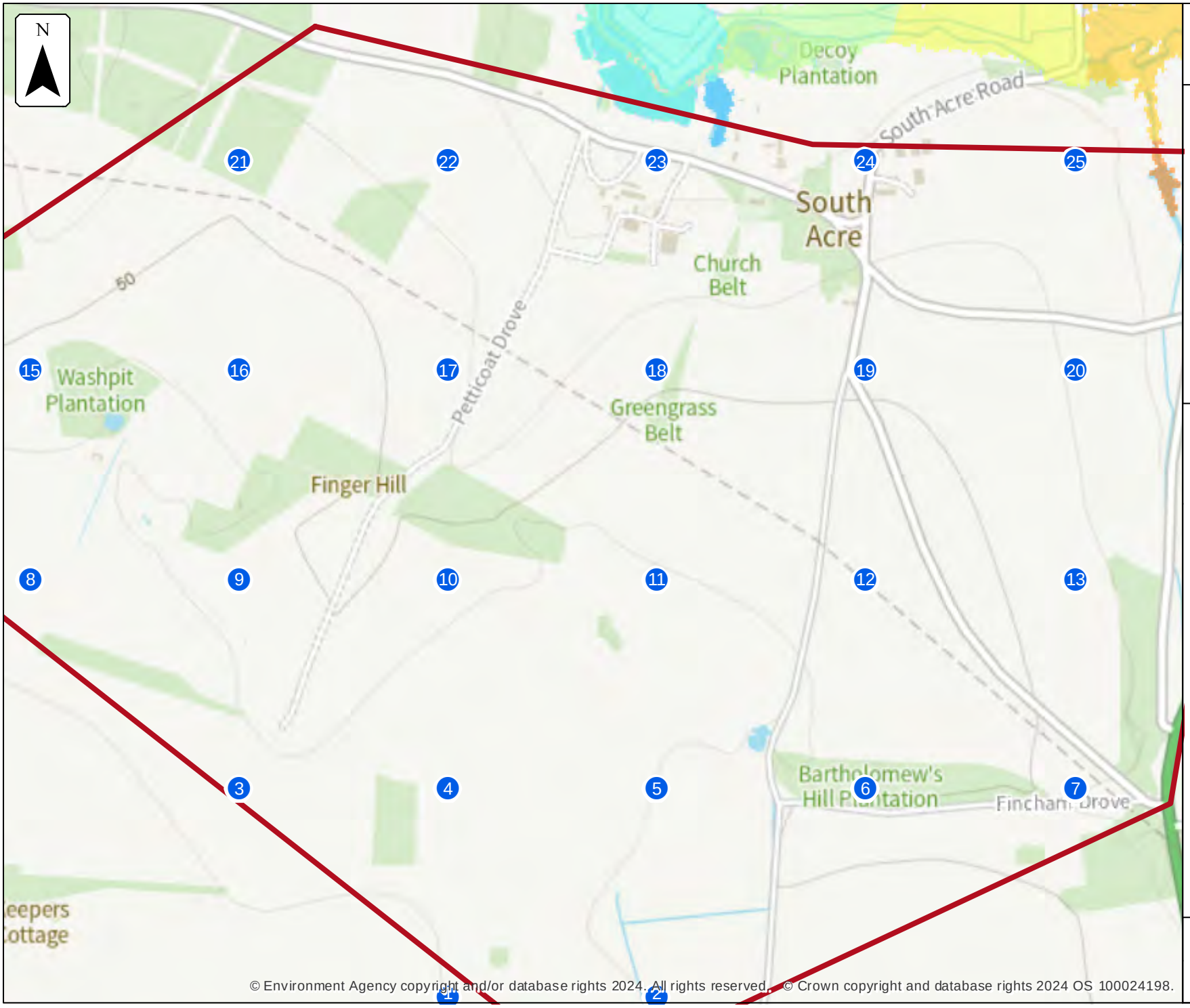
Data in this table comes from the EAn EasternRivers UpperNar MP7 2015 model.
Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.
If no height or depth data is available for a scenario, no table will be shown.
'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

## Defended

| Label | Easting | Northing | 5% AEP | 2% AEP | 1.33% AEP | 1% AEP | 0.5% AEP | 0.1% AEP |
|---|---|---|---|---|---|---|---|---|
| | | | Height | Height | Height | Height | Height | Height |
| 1 | 580395 | 312767 | NoData | NoData | NoData | NoData | NoData | NoData |
| 2 | 580803 | 312767 | NoData | NoData | NoData | NoData | NoData | NoData |
| 3 | 579987 | 313175 | NoData | NoData | NoData | NoData | NoData | NoData |
| 4 | 580395 | 313175 | NoData | NoData | NoData | NoData | NoData | NoData |
| 5 | 580803 | 313175 | NoData | NoData | NoData | NoData | NoData | NoData |
| 6 | 581211 | 313175 | NoData | NoData | NoData | NoData | NoData | NoData |
| 7 | 581619 | 313175 | NoData | NoData | NoData | NoData | NoData | NoData |
| 8 | 579579 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 9 | 579987 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 10 | 580395 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 11 | 580803 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 12 | 581211 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 13 | 581619 | 313583 | NoData | NoData | NoData | NoData | NoData | NoData |
| 14 | 579171 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 15 | 579579 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 16 | 579987 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 17 | 580395 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 18 | 580803 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |

| Label | Easting | Northing | 5% AEP | 2% AEP | 1.33% AEP | 1% AEP | 0.5% AEP | 0.1% AEP |
|---|---|---|---|---|---|---|---|---|
| | | | Height | Height | Height | Height | Height | Height |
| 19 | 581211 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 20 | 581619 | 313991 | NoData | NoData | NoData | NoData | NoData | NoData |
| 21 | 579987 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| 22 | 580395 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| 23 | 580803 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| 24 | 581211 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| 25 | 581619 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| 26 | 582027 | 314399 | NoData | NoData | NoData | NoData | NoData | NoData |
| Max value in selected area: | | | 27.07 | 27.10 | 27.10 | 27.10 | 27.13 | 27.14 |

Data in this table comes from the EAn EasternRivers UpperNar MP7 2015 model.
Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.
If no height or depth data is available for a scenario, no table will be shown.
'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.




Environment Agency

**Defended climate change modelled fluvial extent and height**

Location (easting/northing)
**580678/313731**

Scale
**1:10,000**

Created
**2 Sep 2024**

Model name
**EAn EasternRivers UpperNar MP7 2015**

Selected area

Main river

Modelled 2D grid
*Water level in mAOD*

- 0 - 24.0
- 24.0 - 24.5
- 24.5 - 25.0
- 25.0 - 25.5
- 25.5 - 26.0
- 26.0 - 26.5
- 26.5 - 27.0
- 27.0 - 27.5
- 27.5 - 28.0

This map shows the 1.0% AEP +20% height data

0 100 200 300 400 500
metres

# Sample point data

## Defended climate change

| Label | Easting | Northing | 1% AEP (+20%) | 1% AEP (+20%) |
|---|---|---|---|---|
| | | | Depth | Height |
| 1 | 580395 | 312767 | NoData | NoData |
| 2 | 580803 | 312767 | NoData | NoData |
| 3 | 579987 | 313175 | NoData | NoData |
| 4 | 580395 | 313175 | NoData | NoData |
| 5 | 580803 | 313175 | NoData | NoData |
| 6 | 581211 | 313175 | NoData | NoData |
| 7 | 581619 | 313175 | NoData | NoData |
| 8 | 579579 | 313583 | NoData | NoData |
| 9 | 579987 | 313583 | NoData | NoData |
| 10 | 580395 | 313583 | NoData | NoData |
| 11 | 580803 | 313583 | NoData | NoData |
| 12 | 581211 | 313583 | NoData | NoData |
| 13 | 581619 | 313583 | NoData | NoData |
| 14 | 579171 | 313991 | NoData | NoData |
| 15 | 579579 | 313991 | NoData | NoData |
| 16 | 579987 | 313991 | NoData | NoData |

| Label | Easting | Northing | 1% AEP (+20%) | 1% AEP (+20%) |
|---|---|---|---|---|
| | | | Depth | Height |
| 17 | 580395 | 313991 | NoData | NoData |
| 18 | 580803 | 313991 | NoData | NoData |
| 19 | 581211 | 313991 | NoData | NoData |
| 20 | 581619 | 313991 | NoData | NoData |
| 21 | 579987 | 314399 | NoData | NoData |
| 22 | 580395 | 314399 | NoData | NoData |
| 23 | 580803 | 314399 | NoData | NoData |
| 24 | 581211 | 314399 | NoData | NoData |
| 25 | 581619 | 314399 | NoData | NoData |
| 26 | 582027 | 314399 | NoData | NoData |
| Max value in selected area: | | | 1.07 | 27.19 |

Data in this table comes from the EAn EasternRivers UpperNar MP7 2015 model.
Height values are shown in mAOD, and depth values are shown in metres.
Any blank cells show where a particular scenario has not been modelled for this location.
Cells which contain text 'NoData' for a scenario show that return period has been modelled but there is no flood risk for that return period for that location.
If no height or depth data is available for a scenario, no table will be shown.
'Max value in selected area' is the deepest depth or highest height at any location within your drawn boundary.

## Strategic flood risk assessments

We recommend that you check the relevant local authority's strategic flood risk assessment (SFRA) as part of your work to prepare a site specific flood risk assessment.

This should give you information about:

- the potential impacts of climate change in this catchment
- areas defined as functional floodplain
- flooding from other sources, such as surface water, ground water and reservoirs

Your Lead Local Flood Authority is Breckland.

## About this data

This data has been generated by strategic scale flood models and is not intended for use at the individual property scale. If you're intending to use this data as part of a flood risk assessment, please include an appropriate modelling tolerance as part of your assessment. The Environment Agency regularly updates its modelling. We recommend that you check the data provided is the most recent, before submitting your flood risk assessment.

## Flood risk activity permits

Under the Environmental Permitting (England and Wales) Regulations 2016 some developments may require an environmental permit for flood risk activities from the Environment Agency. This includes any permanent or temporary works that are in, over, under, or nearby a designated main river or flood defence structure.

Find out more about flood risk activity permits

## Help and advice

Contact the East Anglia Environment Agency team at enquiries_eastanglia@environment-agency.gov.uk for:

- more information about getting a product 5, 6, 7 or 8
- general help and advice about the site you're requesting data for

# Annex B: Infiltration Testing

Environmental
Geotechnical
Specialists

RGS

# SOAKAWAY
# LETTER
# REPORT

| | |
|---|---|
| job number | C5239/25/E/8044 |
| date | 06.08.2025 |
| site address | Swaffham Road,<br>Swaffham,<br>Norfolk,<br>PE37 7HY |
| written by | S. Hale |
| checked by | R. Palmer |
| issued by | S. Hale |

Please consider the environment before printing this report.

Constructionline
A UK GOVERNMENT CERTIFICATION SERVICE

QMS ISO 9001 : 2015 REGISTERED Cert No. 14123657

QMS ISO 14001 : 2015 REGISTERED Cert No. 14127804

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<ENVIRONMENTAL><GEOTECHNICAL>

# Contents


| | | | Page |
|---|---|---|---|
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| 2. | | Limitations | 2 |
| 3. | | Fieldworks | 2 |
| 4. | | Geology | 3 |
| 5. | | Strata Conditions | 3 |
| 6. | | Insitu Testing | 4 |
| | 6.1 | Soakaway Test | 4 |
| 7. | | Discussion | 5 |
| 8. | | References | 5 |


# Appendices


| | |
|---|---|
| 1. | Site Plan |
| 2. | Trial Pit Records and Photographs |
| 3. | Soakaway Results |

# Report on Soakaway Testing

| | | | |
|---|---|---|---|
| Location: | Swaffham Road<br>Swaffham, Norfolk, PE37 7HY | | |
| For: | Raincloud Consulting Ltd | | |
| Report No. | C5239/25/E/8044 | Report Date: | August 2025 |

For and on behalf of **Rogers Geotechnical Services Ltd**

| | |
|---|---|
| **Steven Hale** BSc FGS<br>Geo-environmental Technician | **Rob Palmer** MSc FGS ACIEH<br>Engineering Director |

## Report Summary[1]

| Item | Comments | Section |
|---|---|---|
| Geology | Superficial Geology – Lowestoft Formation<br>Bedrock Geology – White Chalk Subgroup | 4. |
| Strata Conditions | Topsoil overlying silty, gravelly sand representative of the Lowestoft Formation and weathered White Chalk Subgroup. | 5. |
| Groundwater | No groundwater strikes recorded during investigation. | 5. |
| Suitability of Soakaways | Strata appears suitable for soakaways. However, caution recommended due to the risk of dissolution features associated with the White Chalk Subgroup. | 7. |

[1] This summary should not be relied upon to provide a comprehensive review. All of the information contained in this document should be considered.

# 1. Introduction

We thank you for your request to undertake percolation testing at the above-mentioned site and take pleasure in enclosing the results of this work. The RGS crew were mobilised to site on the 29th of July, with the bulk of the investigation undertaken on the 30th and the 31st July, with reinstatement and demobilisation completed on the 1st of August. This report describes the work undertaken, presents the data obtained and discusses the results of the tests

# 2. Limitations

The recommendations made and opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between trial pit positions, these are for guidance only and no liability can be accepted for their accuracy.

This report has been prepared in accordance with our understanding of current best practice. However, new information or legislation, or changes to best practice may necessitate revision of the report after the date of issue.

# 3. Fieldworks

Nine trial pits were excavated in order to undertake soakaway testing, the positions of which are shown in Appendix 1. It should be appreciated that some trial pits were terminated after 1 or 2 tests due to ground conditions and time constraints. The soakaway tests were undertaken at the base of the pit at depths rational to the construction of soakaways. The soils exposed in the trial pits were logged on site in general accordance with BS5930: 2015 +A1: 2020, and full descriptions are given on the trial pit records which are presented in Appendix 2.

Once excavations were completed, the trial pits were carefully re-instated with the arisings. Whilst every care was taken during the infilling process, including compacting of the infill at regular intervals with the arm of the excavator, it should be appreciated that some mounding of the surface may have resulted. Moreover, the infilled soils may be subjected to settlement over time, such that a depression in the surface may also occur. Therefore, the locations of any pits undertaken in this investigation should be conveyed to the current site user, as the mounds or depressions associated with the pits may present a risk to current site operations. Furthermore, it must be realised that the infilled pits represent an area of disturbance within the site soils, thus the soils at the pit locations may vary characteristically compared to the undisturbed ground. As such, foundations placed in this disturbed material may not perform as anticipated.

# 4. Geology

The available published geological data for the site has been examined and the following table presents the anticipated geology.

**Table 1: Geological Data for the Site**

| Strata Type | Strata Name[2] | Previous Name[3] | Description[3] |
|---|---|---|---|
| Superficial Geology | Lowestoft Formation | Lowestoft Till | The Lowestoft Formation forms an extensive sheet of chalky till, together with outwash sands and gravels, silts and clays. |
| Solid Geology | White Chalk Subgroup | Middle and Upper Chalk Undivided | Chalk with flints. With discrete marl seams, nodular chalk, sponge-rich and flint seams throughout. |

# 5. Strata Conditions

In accordance with the geology of the area, the succession has been shown to include the following:

**Table 2: Generalised Strata Profile**

| **Depth** m below ground level to underside of layer | **Strata Type** | **Positions Layer Revealed** | **Groundwater Strikes** m below ground level |
|---|---|---|---|
| 0.30 – 0.40 | TOPSOIL (Brown, silty, slightly gravely SAND) | All | None |
| 1.00 – +1.60 | Brown, silty, slightly gravelly SAND [LOWESTOFT FORMATION] | TP0-TP02, TP4, TP6-TP8 | None |
| +1.40 – +1.45 | Brown, brown, silty, slightly gravelly SAND [LOWESTOFT FORMATION] | TP0 & TP1 | None |
| +1.35 | White, locally light brown, silty, sandy GRAVEL [WEATHERED WHITE CHALK SUBGROUP] | TP2 | None |
| +1.25 – +1.50 | Light brown, silty, slightly gravelly SAND [WEATHERED WHITE CHALK SUBGROUP] | TP3, TP5 & TP6 | None |

'+' denotes that the strata extended below the termination depth of the investigated positions, thus the extent of the deposit is only proven to the depths indicated.

It should be appreciated that the superficial Lowestoft Formation while not indicated to cover the entire site was present in a number of locations. This formation was present in all trial pits except TP2, TP3 and TP5. Indeed, it appears that these superficial deposits may be present in a crescent shape around the centre of the site.

[2] Sources: British Geological Survey (NERC) Map Sheets 160; Swaffham; Solid and Drift Edition, and Geology of Britain Viewer [*online resource from www.bgs.ac.uk*]
[3] Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [*online resource from www.bgs.ac.uk*]

# 6. Insitu Testing

## 6.1 Soakaway Test

The pit was trimmed and squared as much as practicable to avoid trial pit collapse. It was intended to achieve a depth of up to 2.0m before testing, however, competent ground resulted in shallower depths being achieved. Water was then introduced into the pit at a controlled rate to prevent collapse of the sides and the level monitored at time intervals relative to a reference bar at ground level. The results obtained from the soakaway tests are presented at Appendix 3 and are summarised below:

**Table 3: Soakaway Test Results**

| Location | Soakage Area Dimensions (average) (m) | Depths of soaked strata (m) | Soil Description (of soaked strata) | Infiltration Rate (m/sec) | *Drainage Characteristics |
|---|---|---|---|---|---|
| TP0 | 0.3 x 1.7 | 1.00 to 1.45 | Side – Clayey, silty, slightly gravelly SAND<br>Base – *As above* | $3.0 \times 10^{-5}$<br>$1.6 \times 10^{-5}$ | Good |
| TP1 | 0.3 x 1.5 | 0.87 to 1.40 | Side – Clayey, silty, slightly gravelly SAND<br>Base – *As above* | N/A | Practically impermeable |
| TP2 | 0.3 x 1.35 | 0.96 to 1.35 | Side – Silty, sandy GRAVEL<br>Base – As above | 2.5 x 10-4<br>1.1 x 10-4<br>9.8 x 10-5 | Good |
| TP3 | 0.3 x 1.4 | 0.94 to 1.25 | Side – Silty, slightly gravelly SAND<br>Base – *As above* | 2.4 x 10-5<br>1.2 x 10 -5 | Good |
| TP4 | 0.3 x 1.7 | 1.10 to 1.50 | Side – Silty, slightly gravelly SAND<br>Base – *As above* | 3.1 x 10-5<br>3.4 x 10-5<br>2.1 x 10-5 | Good |
| TP5 | 0.3 x 1.4 | 1.04 to 1.50 | Side – Silty, slightly gravelly SAND<br>Base – *As above* | 1.4 x 10-5<br>1.7 x 10-4<br>9.6 x 10-5 | Good |
| TP6 | 0.3 x 1.5 | 1.22 to 1.45 | Side – Silty, slightly gravelly SAND<br>Base – *As above* | 1.3 x 10-3<br>6.2 x 10-4<br>9.8 x 10-4 | Good |
| TP7 | 0.3 x 1.5 | 1.02 to 1.35 | Side – Silty, slightly gravelly SAND<br>Base – *As above* | 1.6 x 10-3<br>3.9 x 10-4<br>1.3 x 10-4 | Good |
| TP8 | 0.3 x 1.5 | 1.31 to 1.60 | Side – Silty, slightly gravelly SAND<br>Base – *As above* | 1.5 x 10-5<br>1.7 x 10-5 | Good |

*Based on the most onerous results for each test.

During the soakaway test within TP1, the water level did not achieve a fall from 75% to 25% of the effective depth of the storage volume. It is considered that the initial movement was observed as water filling any gaps and fissures within the granular material at the side of the pit. On this basis, the test could not be completed within the scope of the method provided in BRE Digest 365 due to the poor soakage rate of the exposed soils within this particular trial pit. Due to the negligible water movement it was not possbile to extrapolate the results obtained in order to obtain a soil infiltration rate.

All other tests at the remaining locations were carried out successfully as the water level achieved a fall from 75% to 25% of the effective depth of the storage volume. It should be appreciated that it was not possible to carry out three rounds of testing within all trial pits due to time constraints.

# 7. Discussion

The soils encountered beneath the topsoil were found to be typical of the superficial Lowestoft Formation and the weathered fraction of the underlying White Chalk Subgroup. As demonstrated in Section 5 above, the superficial soils are locally absent. However, subsequent drainage characteristics appear to be comparable across the site, with the exception of the in the area of TP1 where the soil appeared to be more clayey. In this instance, the infiltration testing has revealed that the soils have good drainage characteristics.

It should be appreciated that incredibly fast soakage rates were noted within trial pits TP2, TP6 and TP7. These soakage rates are attributed to fractures within the White Chalk Subgroup. The drainage designers must appreciate that such fractures within the White Chalk Subgroup can sometimes be associated with, or lead to the development of, dissolution features. For instance, LiDAR scans of the local area appear to show surface depressions, possibly associated with sinkholes that are caused by dissolution features. As such, whilst the granular soils at the near surface have demonstrated good drainage characteristics, soakaways should be treated with caution due to the risk of causing further dissolution features via the adding of water to the ground through a soakaway. It may be reasoned that the proposed development is relatively low risk, but the potential for surface depressions should still be considered. Should the drainage area be spread over a larger area than necessary, this would allow the discharge of water to dissipate, thus reducing the risk.

# 8. References


- Building Research Establishment (BRE) Digest 365, *Soakaway Design*, September 1991.
- British Standards Institution (2015 +A1: 2020) BS 5930: *Code of practice for ground investigations*, B.S.I., London.
- Barnes, G. (2000). *Soil Mechanics Principle and Practice.* 2nd ed. London: Macmillan Press Ltd, p.47.

# Appendix 1

## Site Plan


**Notes:**

RGS Environmental Geotechnical Specialists

**Rogers Geotechnical Services Ltd**

Offices 1 & 2, Barncliffe Business Park,
Near Bank,
Shelley,
Huddersfield,
HD8 8LU

**Telephone:** 0843 50 66 87
**www.rogersgeotech.co.uk**

**Client:**

Raincloud Consulting Ltd

**Job Number:**

C5239/25/E/8044

**Project Details:**

Swaffham Road, Swaffham,
Norfolk, PE37 7HY

| **Scale:** | Not to scale - reference only |
|---|---|

ground investigation · drilling & excavation · insitu testing
laboratory testing & gas monitoring · engineering consultancy
surveying & flood risk assessments · training, CPD & expert witness
... delivered using our own drilling rigs / crews / soils lab / engineers

# Appendix 2

## Trial Pit Records and Photographs

# Trial Pit Log

Trialpit No **TP0**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: Swaffham Road | Project No. C5239/25/E/8044 | Co-ords: - Level: | Date 31/07/2025 |
| Location: Swaffham, Norfolk, PE37 7HY | | Dimensions (m): Depth 1.45 — 1.7 × 0.3 | Scale 1:25 |
| Client: Raincloud Consulting Ltd | | | Logged SH |

| Water Strike | Samples and In Situ Testing: Depth | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | 0.30 | | | TOPSOIL (Brown, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to coarse of flint). |
| | | | | 1.00 | | | Brown, silty, slightly gravelly, fine to coarse SAND with low cobble content. Gravel is sub-angular to sub-rounded and fine to coarse of flint. Cobbles are sub-angular to sub-rounded of flint. [LOWESTOFT FORMATION] |
| | | | | 1.45 | | | Brown, clayey, silty, slightly gravelly, fine to coarse SAND with moderate cobble content. Gravel is sub-angular to sub-rounded and fine to coarse of flint. Cobbles are sub-angular to sub-rounded of flint. [LOWESTOFT FORMATION] |
| | | | | | | | End of pit at 1.45 m |

1 2 3 4 5

Remarks:

Stability: Stable

# Trial Pit Log

Trialpit No **TP1**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: Swaffham Road | Project No. C5239/25/E/8044 | Co-ords: - Level: | Date 31/07/2025 |
| Location: Swaffham, Norfolk, PE37 7HY | | Dimensions (m): Depth 1.40 — 1.5 × 0.3 | Scale 1:25 |
| Client: Raincloud Consulting Ltd | | | Logged SH |

| Water Strike | Samples and In Situ Testing: Depth | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | | | TOPSOIL (Brown, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to coarse of flint). |
| | | | | 0.40 | | | Brown, silty, slightly gravelly, fine to coarse SAND with low cobble content. Gravel is sub-angular to sub-rounded and fine to coarse of flint. Cobbles are sub-angular to sub-rounded of flint. [LOWESTOFT FORMATION] |
| | | | | 1.00 | | | Brown, clayey, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to coarse of flint. [LOWESTOFT FORMATION] |
| | | | | 1.40 | | | End of pit at 1.40 m |

1 2 3 4 5

Remarks:

Stability: Stable

# Trial Pit Log

Trialpit No **TP2**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: Swaffham Road | Project No. C5239/25/E/8044 | Co-ords: - Level: | Date 30/07/2025 |
| Location: Swaffham, Norfolk, PE37 7HY | | Dimensions (m): Depth 1.35 — 1.35 × 0.3 | Scale 1:25 |
| Client: Raincloud Consulting Ltd | | | Logged SH |

| Water Strike | Samples and In Situ Testing: Depth | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | 0.35 | | | TOPSOIL (Brown, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to coarse of flint). |
| | | | | 1.35 | | | White, locally light brown, silty,, sandy, sub-angular to sub-rounded and fine to coarse GRAVEL of chalk and flint with moderate cobble content and low boulder content. Sand is fine to coarse. Cobbles are sub-angular to sub-rounded of chalk and flint. Boulders are sub-angular to sub-rounded of flint. [WEATHERED WHITE CHALK SUBGROUP] |
| | | | | | | | End of pit at 1.35 m |

1 2 3 4 5

Remarks:

Stability: Stable

# Trial Pit Log

Trialpit No **TP3**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: Swaffham Road | Project No. C5239/25/E/8044 | Co-ords: - Level: | Date 30/07/2025 |
| Location: Swaffham, Norfolk, PE37 7HY | | Dimensions (m): Depth 1.25 — 1.4 × 0.3 | Scale 1:25 |
| Client: Raincloud Consulting Ltd | | | Logged SH |

| Water Strike | Samples and In Situ Testing: Depth | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | | | TOPSOIL (Brown, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to coarse of flint). |
| | | | | 0.40 | | | Light brown, silty, slightly gravelly, fine to coarse SAND with moderate cobble content. Gravel is sub-angular to sub-rounded and fine to coarse of chalk and flint. Cobbles are sub-angular to sub-rounded of chalk and flint. [WEATHERED WHITE CHALK SUBGROUP] |
| | | | | 1.25 | | | End of pit at 1.25 m |

1 2 3 4 5

Remarks:

Stability: Stable

# Trial Pit Log

Trialpit No **TP4**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: Swaffham Road | Project No. C5239/25/E/8044 | Co-ords: - Level: | Date 30/07/2025 |
| Location: Swaffham, Norfolk, PE37 7HY | | Dimensions (m): Depth 1.50 — 1.7 × 0.3 | Scale 1:25 |
| Client: Raincloud Consulting Ltd | | | Logged SH |

| Water Strike | Samples and In Situ Testing: Depth | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | 0.40 | | | TOPSOIL (Brown, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to coarse of flint). |
| | | | | 1.50 | | | Brown, silty, slightly gravelly, fine to coarse SAND with moderate cobble content. Gravel is sub-angular to sub-rounded and fine to coarse of flint. Cobbles are sub-angular to sub-rounded of flint. [LOWESTOFT FORMATION] |
| | | | | | | | End of pit at 1.50 m |

1 2 3 4 5

Remarks:

Stability: Stable

# Trial Pit Log

Trialpit No **TP5**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: Swaffham Road | Project No. C5239/25/E/8044 | Co-ords: - Level: | Date 30/07/2025 |
| Location: Swaffham, Norfolk, PE37 7HY | | Dimensions (m): Depth 1.50 — 1.4 × 0.3 | Scale 1:25 |
| Client: Raincloud Consulting Ltd | | | Logged SH |

| Water Strike | Samples and In Situ Testing: Depth | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | | | TOPSOIL (Brown, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to coarse of flint). |
| | | | | 0.40 | | | Light brown, silty, slightly gravelly, fine to coarse SAND with moderate cobble content. Gravel is sub-angular to sub-rounded and fine to coarse of chalk and flint. Cobbles are sub-angular to sub-rounded of chalk and flint. [WEATHERED WHITE CHALK SUBGROUP] |
| | | | | 1.50 | | | End of pit at 1.50 m |

Remarks:

Stability: Stable

# Trial Pit Log

Trialpit No **TP6**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: Swaffham Road | Project No. C5239/25/E/8044 | Co-ords: - Level: | Date 30/07/2025 |
| Location: Swaffham, Norfolk, PE37 7HY | | Dimensions (m): Depth 1.45 — 1.5 × 0.3 | Scale 1:25 |
| Client: Raincloud Consulting Ltd | | | Logged SH |

| Water Strike | Samples and In Situ Testing: Depth | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | 0.35 | | | TOPSOIL (Brown, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to coarse of flint). |
| | | | | | | | Brown, silty, slightly gravelly, fine to coarse SAND with moderate cobble content. Gravel is sub-angular to sub-rounded and fine to coarse of flint. Cobbles are sub-angular to sub-rounded of flint. [LOWESTOFT FORMATION] |
| | | | | 1.35 | | | Light brown, silty, slightly gravelly, fine to coarse SAND with low cobble content. Gravel is sub-angular to sub-rounded and fine to coarse of chalk and flint. Cobbles are sub-angular to sub-rounded of chalk and flint. [WEATHERED WHITE CHALK SUBGROUP] |
| | | | | 1.45 | | | End of pit at 1.35 m |

1 2 3 4 5

Remarks:

Stability: Stable

# Trial Pit Log

Trialpit No **TP7**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: Swaffham Road | Project No. C5239/25/E/8044 | Co-ords: - Level: | Date 31/07/2025 |
| Location: Swaffham, Norfolk, PE37 7HY | | Dimensions (m): Depth 1.35 — 1.5 × 0.3 | Scale 1:25 |
| Client: Raincloud Consulting Ltd | | | Logged SH |

| Water Strike | Samples and In Situ Testing: Depth | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | 0.35 | | | TOPSOIL (Brown, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to coarse of flint). |
| | | | | | | | Brown, silty, slightly gravelly, fine to coarse SAND with moderate cobble content. Gravel is sub-angular to sub-rounded and fine to coarse of flint. Cobbles are sub-angular to sub-rounded of flint. [LOWESTOFT FORMATION] |
| | | | | 1.35 | | | End of pit at 1.35 m |

1 2 3 4 5

Remarks:

Stability: Stable

# Trial Pit Log

Trialpit No **TP8**

Sheet 1 of 1

| | | | |
|---|---|---|---|
| Project Name: Swaffham Road | Project No. C5239/25/E/8044 | Co-ords: - Level: | Date 31/07/2025 |
| Location: Swaffham, Norfolk, PE37 7HY | | Dimensions (m): Depth 1.60 — 1.5 × 0.3 | Scale 1:25 |
| Client: Raincloud Consulting Ltd | | | Logged SH |

| Water Strike | Samples and In Situ Testing: Depth | Type | Results | Depth (m) | Level (m) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | 0.40 | | | TOPSOIL (Brown, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to coarse of flint). |
| | | | | 1.60 | | | Brown, silty, slightly gravelly, fine to coarse SAND with low cobble content. Gravel is sub-angular to sub-rounded and fine to coarse of flint. Cobbles are sub-angular to sub-rounded of flint. [LOWESTOFT FORMATION]<br>End of pit at 1.60 m |

Remarks:

Stability: Stable

Photo 1: TP0

Photo 2: TP2

| | | | |
|---|---|---|---|
| RGS Environmental Geotechnical Specialists | Site Name:<br>**Swaffham Road** | Job No:<br>**C5239/25/E/8044** | **t. 0843 50 666 87**<br>**www.rogersgeotech.co.uk** |

Photo 1: TP3

Photo 2: TP4

RGS Environmental Geotechnical Specialists

Site Name:

**Swaffham Road**

Job No:

**C5239/25/E/8044**

t. 0843 50 666 87
www.rogersgeotech.co.uk

Photo 1: TP5

Photo 2: TP6

| | | | |
|---|---|---|---|
| RGS Environmental Geotechnical Specialists | Site Name:<br>**Swaffham Road** | Job No:<br>**C5239/25/E/8044** | **t. 0843 50 666 87**<br>**www.rogersgeotech.co.uk** |

Photo 1: TP7

Photo 2: TP8

Environmental Geotechnical Specialists

Site Name:

**Swaffham Road**

Job No:

**C5239/25/E/8044**

t. 0843 50 666 87
www.rogersgeotech.co.uk

# Appendix 3

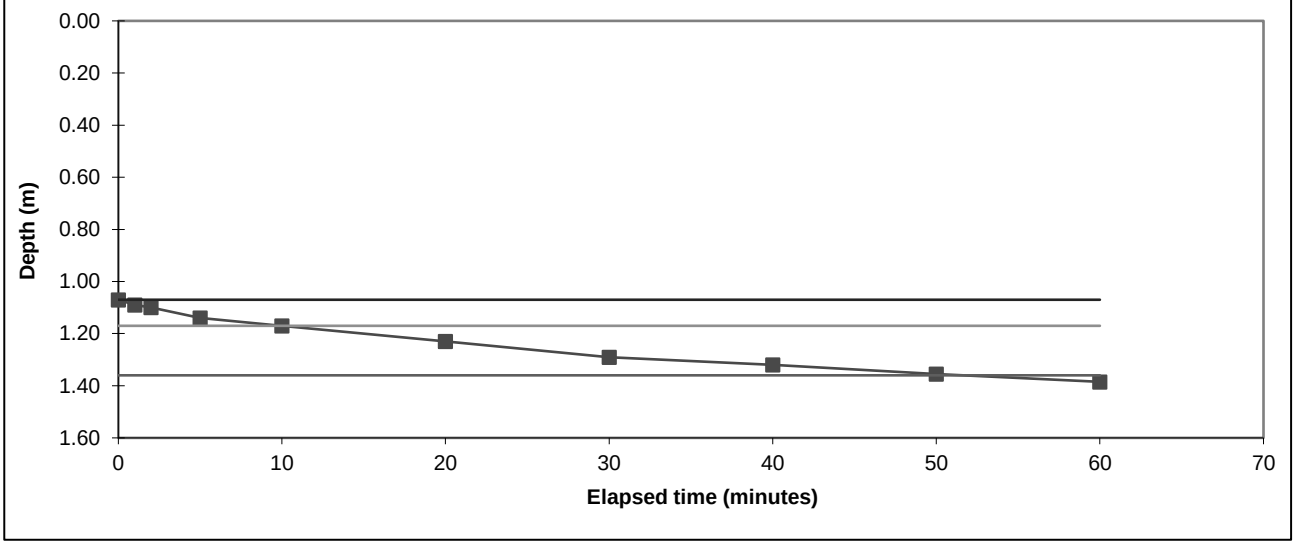
## Soakaway Results

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP0 | Test No: | 1 | Date: | 31.07.2025 |
| Length (m): | 1.700 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.45 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.070 | | |
| 1 | 1.090 | | |
| 2 | 1.100 | | |
| 5 | 1.140 | | |
| 10 | 1.170 | | |
| 20 | 1.230 | | |
| 30 | 1.290 | | |
| 40 | 1.320 | | |
| 50 | 1.355 | | |
| 60 | 1.385 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.07 | | |
| 75% effective depth (mbgl): | 1.17 | Elapsed time (mins): | 10.0 |
| 50% effective depth (mbgl): | 1.26 | | |
| 25% effective depth (mbgl): | 1.36 | Elapsed time (mins): | 51.7 |
| Base of soakage zone (mbgl): | 1.45 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.097 |
| Mean surface area of outflow ($m^2$): | 1.27 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 41.7 |

| **Soil infiltration rate (m/s):** | **3.0E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).

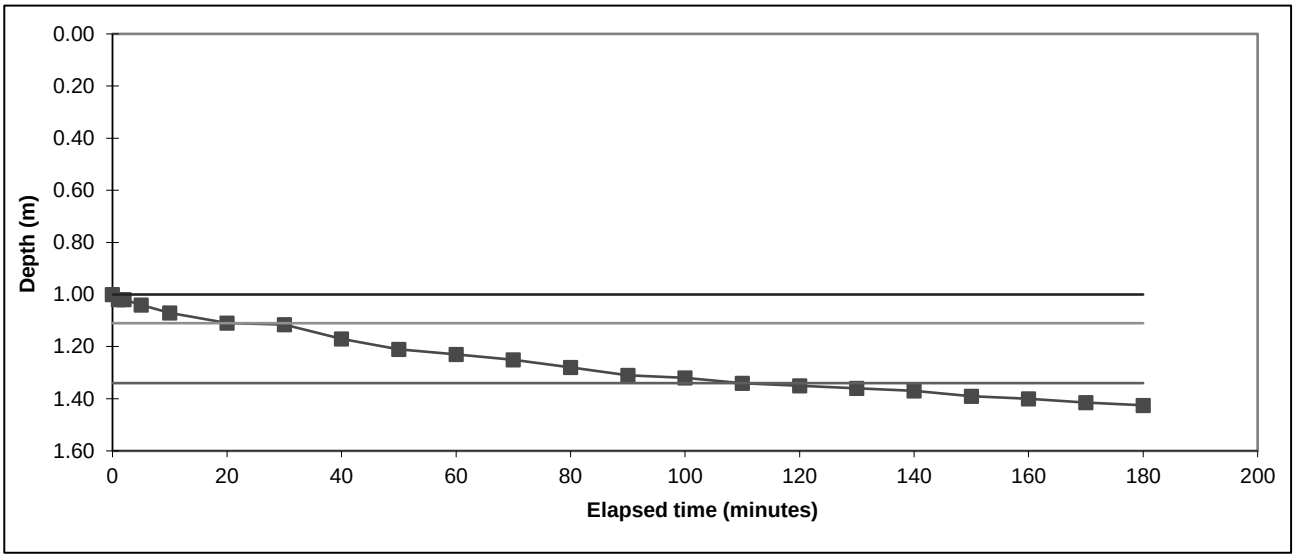
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP0 | Test No: | 2 | Date: | 31.07.2025 |
| Length (m): | 1.700 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.45 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.000 | 110 | 1.340 |
| 1 | 1.020 | 120 | 1.350 |
| 2 | 1.020 | 130 | 1.360 |
| 5 | 1.040 | 140 | 1.370 |
| 10 | 1.070 | 150 | 1.390 |
| 20 | 1.110 | 160 | 1.400 |
| 30 | 1.115 | 170 | 1.415 |
| 40 | 1.170 | 180 | 1.425 |
| 50 | 1.210 | | |
| 60 | 1.230 | | |
| 70 | 1.250 | | |
| 80 | 1.280 | | |
| 90 | 1.310 | | |
| 100 | 1.320 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.00 | | |
| 75% effective depth (mbgl): | 1.11 | Elapsed time (mins): | 20.0 |
| 50% effective depth (mbgl): | 1.23 | | |
| 25% effective depth (mbgl): | 1.34 | Elapsed time (mins): | 110.0 |
| Base of soakage zone (mbgl): | 1.45 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.117 |
| Mean surface area of outflow ($m^2$): | 1.39 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 90.0 |

| **Soil infiltration rate (m/s):** | **1.6E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).

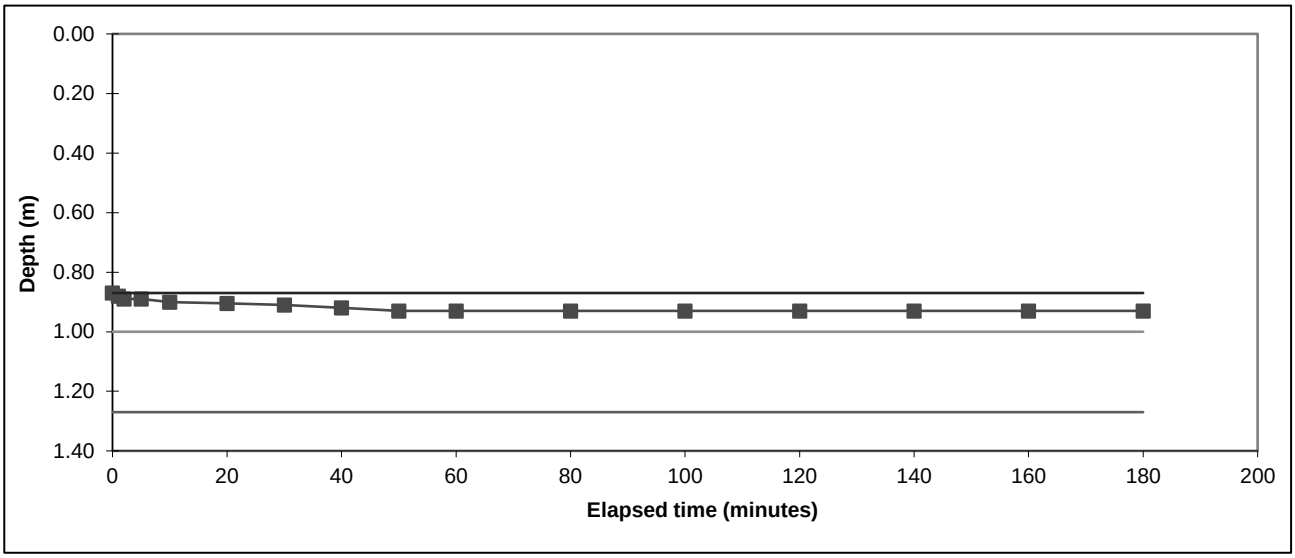
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP1 | Test No: | 1 | Date: | 31.07.2025 |
| Length (m): | 1.500 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.40 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 0.870 | 160 | 0.930 |
| 1 | 0.880 | 180 | 0.930 |
| 2 | 0.890 | | |
| 5 | 0.890 | | |
| 10 | 0.900 | | |
| 20 | 0.905 | | |
| 30 | 0.910 | | |
| 40 | 0.920 | | |
| 50 | 0.930 | | |
| 60 | 0.930 | | |
| 80 | 0.930 | | |
| 100 | 0.930 | | |
| 120 | 0.930 | | |
| 140 | 0.930 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 0.87 | | |
| 75% effective depth (mbgl): | 1.00 | Elapsed time (mins): | #N/A |
| 50% effective depth (mbgl): | 1.14 | | |
| 25% effective depth (mbgl): | 1.27 | Elapsed time (mins): | #N/A |
| Base of soakage zone (mbgl): | 1.40 | | |
| Volume outflow between 75% and 25% effective depth ($m^3$): | | | |
| Mean surface area of outflow ($m^2$): | | | 1.39 |
| (side area at 50% effective depth + base area) | | | |
| Time for outflow between 75% and 25% effective depth (mins): | | | |

| | |
|---|---|
| **Soil infiltration rate (m/s):** | **Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.** |

**Remarks** Results processed following BRE 365 (2007).
Ground appears to be practically impermeable.

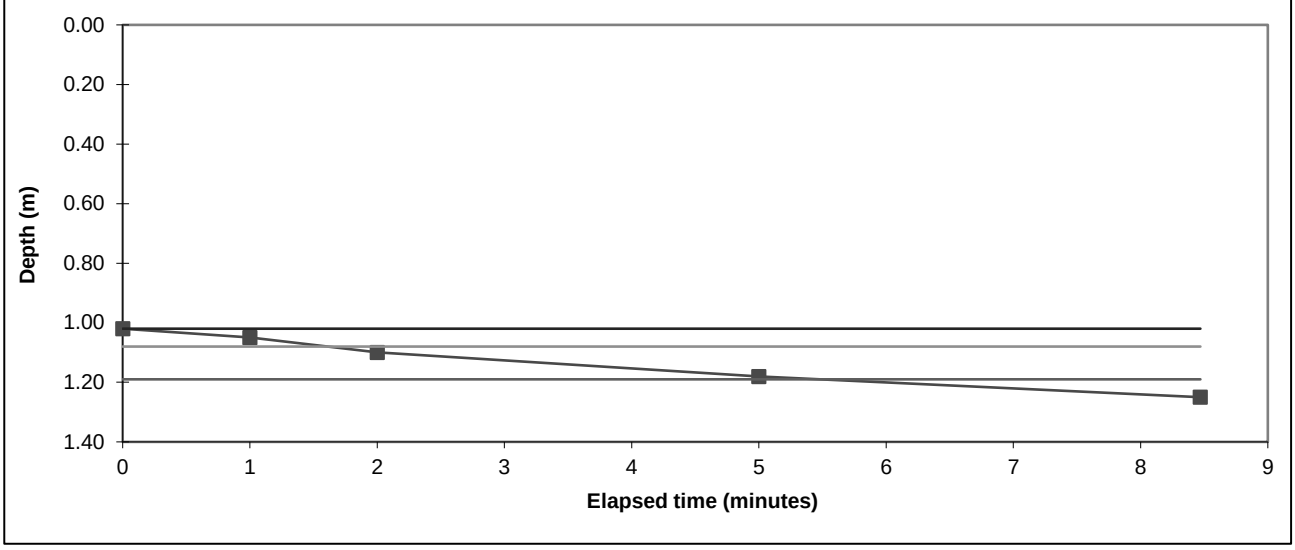
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP2 | Test No: | 1 | Date: | 30.07.2025 |
| Length (m): | 1.350 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.25 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.020 | | |
| 1 | 1.050 | | |
| 2 | 1.100 | | |
| 5 | 1.180 | | |
| 8.47 | 1.250 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.02 | | |
| 75% effective depth (mbgl): | 1.08 | Elapsed time (mins): | 1.6 |
| 50% effective depth (mbgl): | 1.14 | | |
| 25% effective depth (mbgl): | 1.19 | Elapsed time (mins): | 5.5 |
| Base of soakage zone (mbgl): | 1.25 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.045 |
| Mean surface area of outflow ($m^2$): | 0.77 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 3.9 |

| **Soil infiltration rate (m/s):** | **2.5E-4** |
|---|---|

| | |
|---|---|
| **Remarks** | Results processed following BRE 365 (2007).<br>Water appeared to drain out into a sinkhole. New base of pit due to silt and sand settlement. |

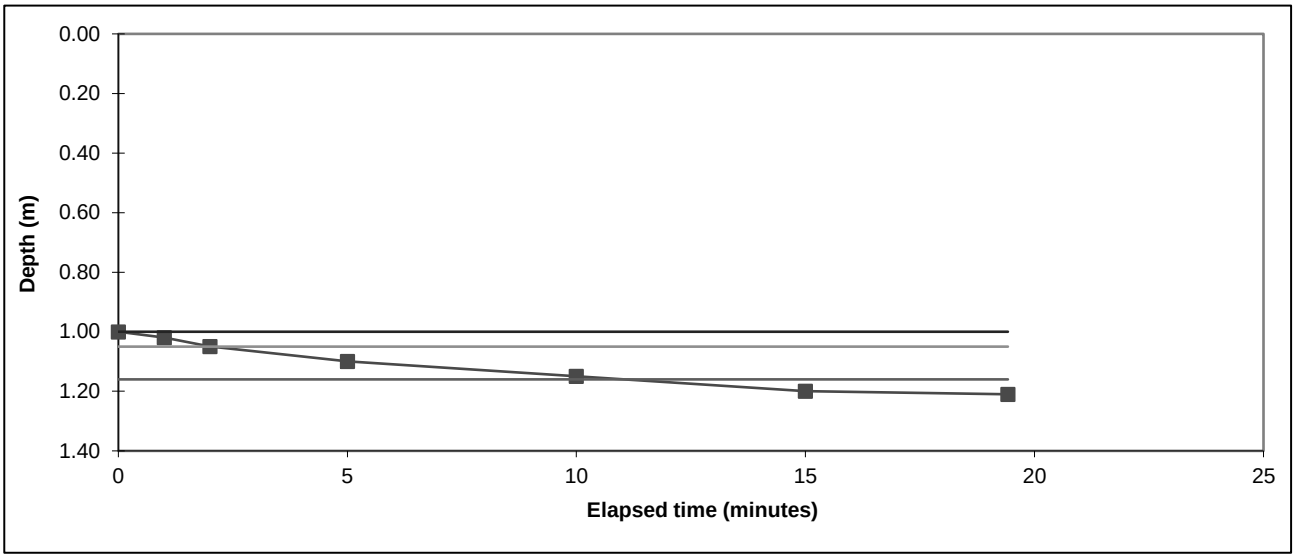
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP2 | Test No: | 2 | Date: | 30.07.2025 |
| Length (m): | 1.350 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.21 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.000 | | |
| 1 | 1.020 | | |
| 2 | 1.050 | | |
| 5 | 1.100 | | |
| 10 | 1.150 | | |
| 15 | 1.200 | | |
| 19.42 | 1.210 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.00 | | |
| 75% effective depth (mbgl): | 1.05 | Elapsed time (mins): | 2.0 |
| 50% effective depth (mbgl): | 1.11 | | |
| 25% effective depth (mbgl): | 1.16 | Elapsed time (mins): | 11.0 |
| Base of soakage zone (mbgl): | 1.21 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.045 |
| Mean surface area of outflow ($m^2$): | 0.74 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 9.0 |

| **Soil infiltration rate (m/s):** | **1.1E-4** |
|---|---|

| | |
|---|---|
| **Remarks** | Results processed following BRE 365 (2007).<br>Water appeared to drain out into a sinkhole. New base of pit due to silt and sand settlement. |

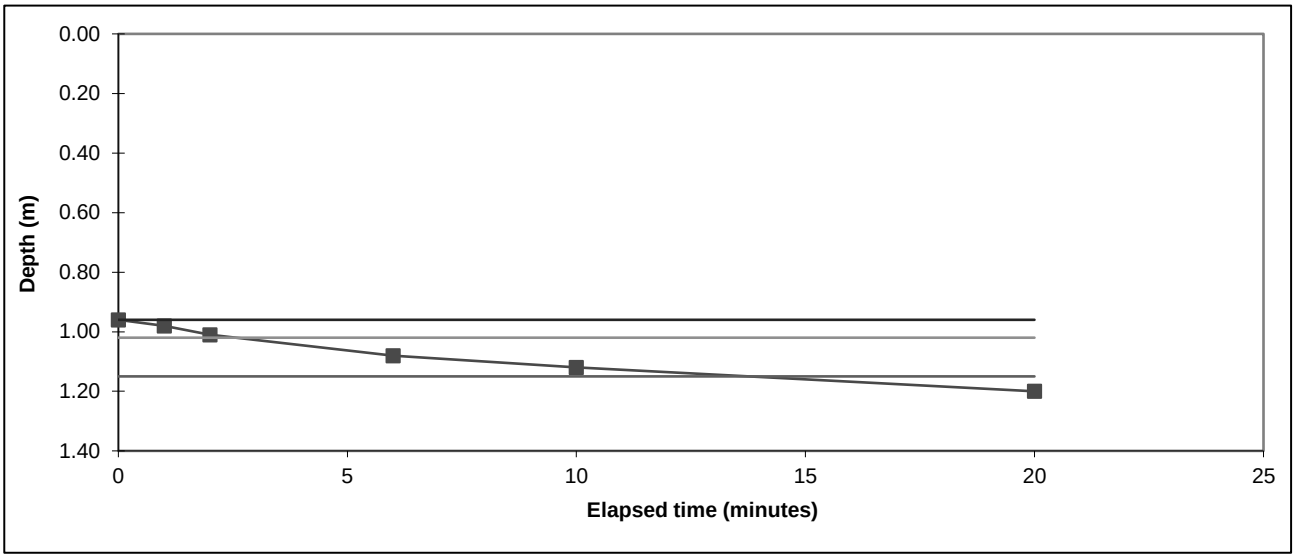
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP2 | Test No: | 3 | Date: | 30.07.2025 |
| Length (m): | 1.350 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.21 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 0.960 | | |
| 1 | 0.980 | | |
| 2 | 1.010 | | |
| 6 | 1.080 | | |
| 10 | 1.120 | | |
| 20 | 1.200 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 0.96 | | |
| 75% effective depth (mbgl): | 1.02 | Elapsed time (mins): | 2.6 |
| 50% effective depth (mbgl): | 1.09 | | |
| 25% effective depth (mbgl): | 1.15 | Elapsed time (mins): | 13.8 |
| Base of soakage zone (mbgl): | 1.21 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.053 |
| Mean surface area of outflow ($m^2$): | 0.80 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 11.2 |

| **Soil infiltration rate (m/s):** | **9.8E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
Water appeared to drain out into a sinkhole.

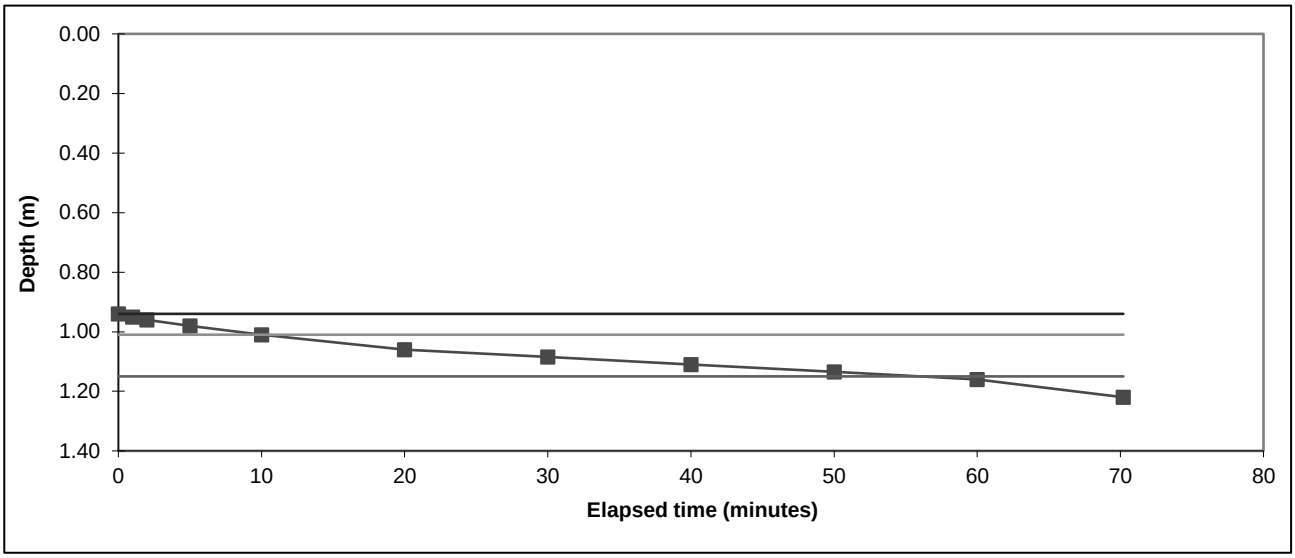
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP3 | Test No: | 1 | Date: | 30.07.2025 |
| Length (m): | 1.400 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.22 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 0.940 | | |
| 1 | 0.950 | | |
| 2 | 0.960 | | |
| 5 | 0.980 | | |
| 10 | 1.010 | | |
| 20 | 1.060 | | |
| 30 | 1.085 | | |
| 40 | 1.110 | | |
| 50 | 1.135 | | |
| 60 | 1.160 | | |
| 70.21 | 1.220 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 0.94 | | |
| 75% effective depth (mbgl): | 1.01 | Elapsed time (mins): | 10.0 |
| 50% effective depth (mbgl): | 1.08 | | |
| 25% effective depth (mbgl): | 1.15 | Elapsed time (mins): | 56.0 |
| Base of soakage zone (mbgl): | 1.22 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.059 |
| Mean surface area of outflow ($m^2$): | 0.90 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 46.0 |

| **Soil infiltration rate (m/s):** | **2.4E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
New base of pit due to silt and sand.

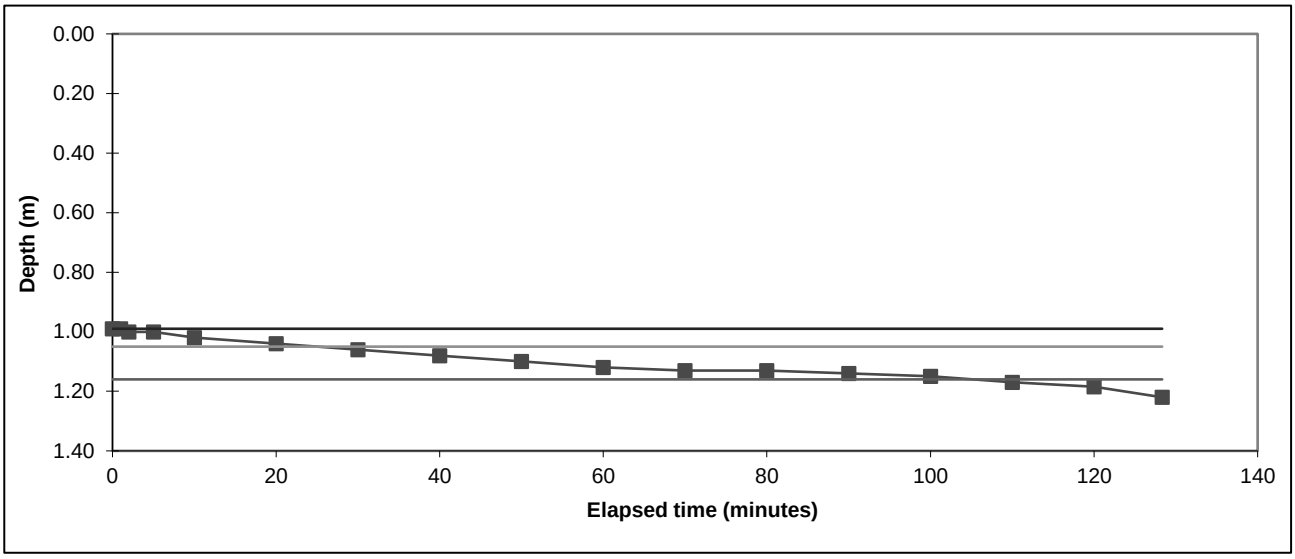
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP3 | Test No: | 2 | Date: | 30.07.2025 |
| Length (m): | 1.400 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.22 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 0.990 | 110 | 1.170 |
| 1 | 0.990 | 120 | 1.185 |
| 2 | 1.000 | 128.33 | 1.220 |
| 5 | 1.000 | | |
| 10 | 1.020 | | |
| 20 | 1.040 | | |
| 30 | 1.060 | | |
| 40 | 1.080 | | |
| 50 | 1.100 | | |
| 60 | 1.120 | | |
| 70 | 1.130 | | |
| 80 | 1.130 | | |
| 90 | 1.140 | | |
| 100 | 1.150 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 0.99 | | |
| 75% effective depth (mbgl): | 1.05 | Elapsed time (mins): | 25.0 |
| 50% effective depth (mbgl): | 1.11 | | |
| 25% effective depth (mbgl): | 1.16 | Elapsed time (mins): | 105.0 |
| Base of soakage zone (mbgl): | 1.22 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.046 |
| Mean surface area of outflow ($m^2$): | 0.79 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 80.0 |

| **Soil infiltration rate (m/s):** | **1.2E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).

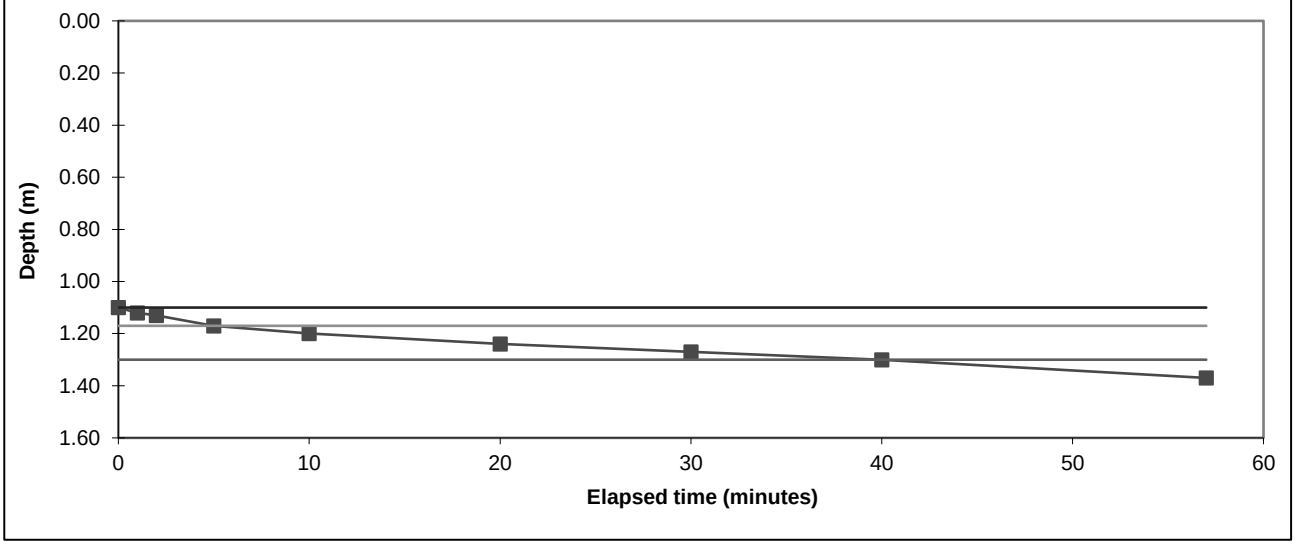
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP4 | Test No: | 1 | Date: | 30.07.2025 |
| Length (m): | 1.700 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.37 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.100 | | |
| 1 | 1.120 | | |
| 2 | 1.130 | | |
| 5 | 1.170 | | |
| 10 | 1.200 | | |
| 20 | 1.240 | | |
| 30 | 1.270 | | |
| 40 | 1.300 | | |
| 57 | 1.370 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.10 | | |
| 75% effective depth (mbgl): | 1.17 | Elapsed time (mins): | 5.0 |
| 50% effective depth (mbgl): | 1.24 | | |
| 25% effective depth (mbgl): | 1.30 | Elapsed time (mins): | 40.0 |
| Base of soakage zone (mbgl): | 1.37 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.066 |
| Mean surface area of outflow ($m^2$): | 1.03 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 35.0 |

| **Soil infiltration rate (m/s):** | **3.1E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
New base of pit due to silt and sand.

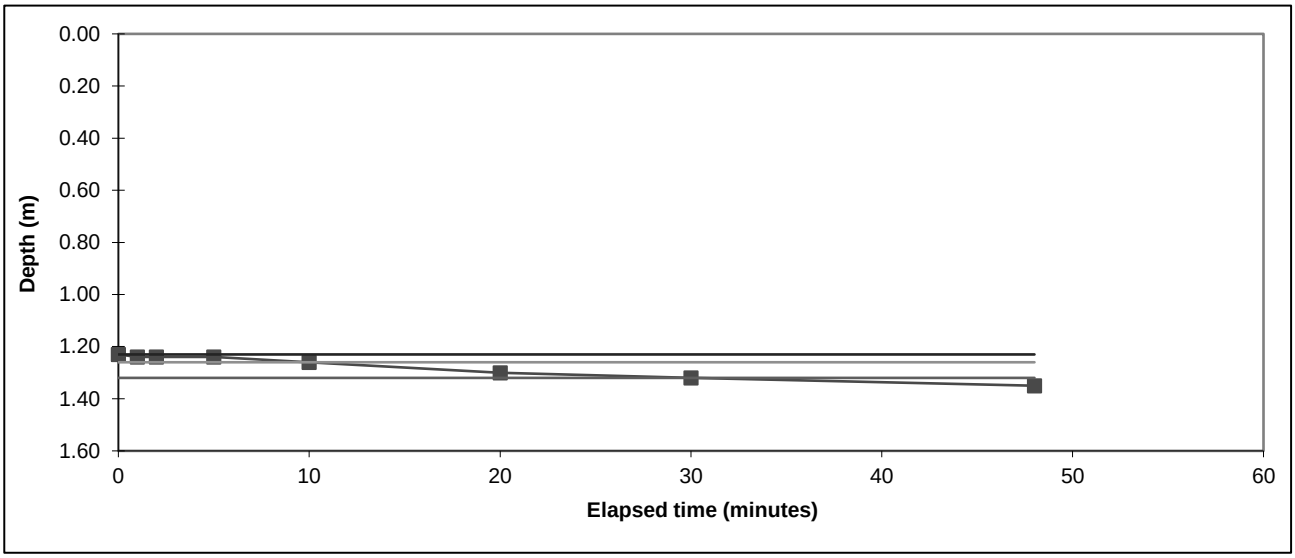
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP4 | Test No: | 2 | Date: | 30.07.2025 |
| Length (m): | 1.700 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.35 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.230 | | |
| 1 | 1.240 | | |
| 2 | 1.240 | | |
| 5 | 1.240 | | |
| 10 | 1.260 | | |
| 20 | 1.300 | | |
| 30 | 1.320 | | |
| 48 | 1.350 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.23 | | |
| 75% effective depth (mbgl): | 1.26 | Elapsed time (mins): | 10.0 |
| 50% effective depth (mbgl): | 1.29 | | |
| 25% effective depth (mbgl): | 1.32 | Elapsed time (mins): | 30.0 |
| Base of soakage zone (mbgl): | 1.35 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.031 |
| Mean surface area of outflow ($m^2$): | 0.75 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 20.0 |

| **Soil infiltration rate (m/s):** | **3.4E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
New base of pit due to silt and sand.

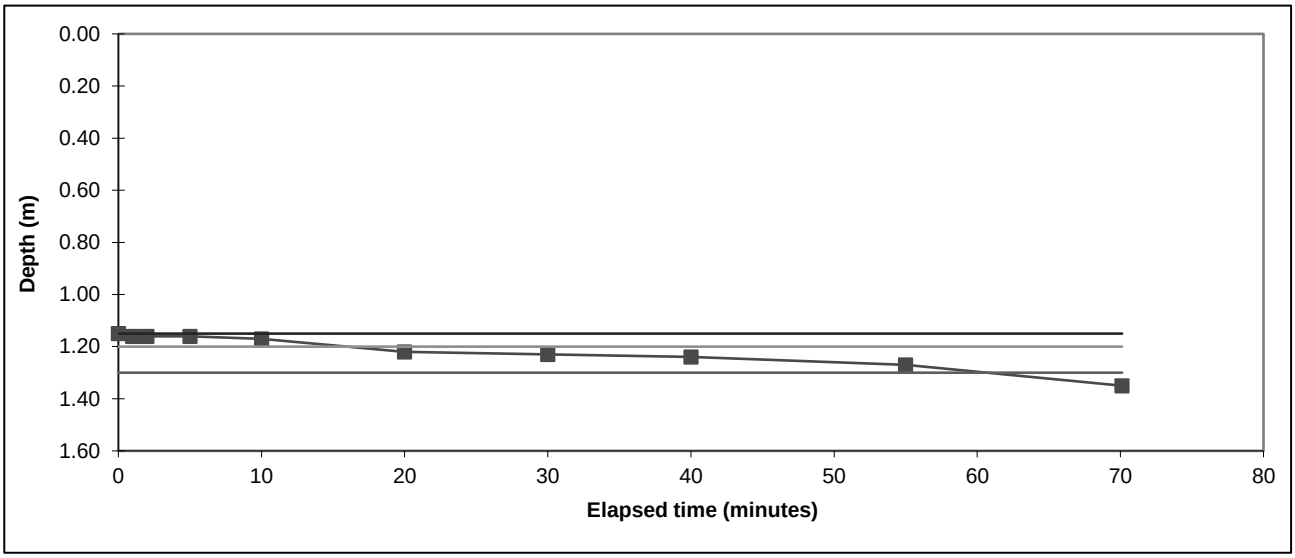
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP4 | Test No: | 3 | Date: | 30.07.2025 |
| Length (m): | 1.700 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.35 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.150 | | |
| 1 | 1.160 | | |
| 2 | 1.160 | | |
| 5 | 1.160 | | |
| 10 | 1.170 | | |
| 20 | 1.220 | | |
| 30 | 1.230 | | |
| 40 | 1.240 | | |
| 55 | 1.270 | | |
| 70.12 | 1.350 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.15 | | |
| 75% effective depth (mbgl): | 1.20 | Elapsed time (mins): | 16.0 |
| 50% effective depth (mbgl): | 1.25 | | |
| 25% effective depth (mbgl): | 1.30 | Elapsed time (mins): | 60.7 |
| Base of soakage zone (mbgl): | 1.35 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.051 |
| Mean surface area of outflow ($m^2$): | 0.91 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 44.7 |

| **Soil infiltration rate (m/s):** | **2.1E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).

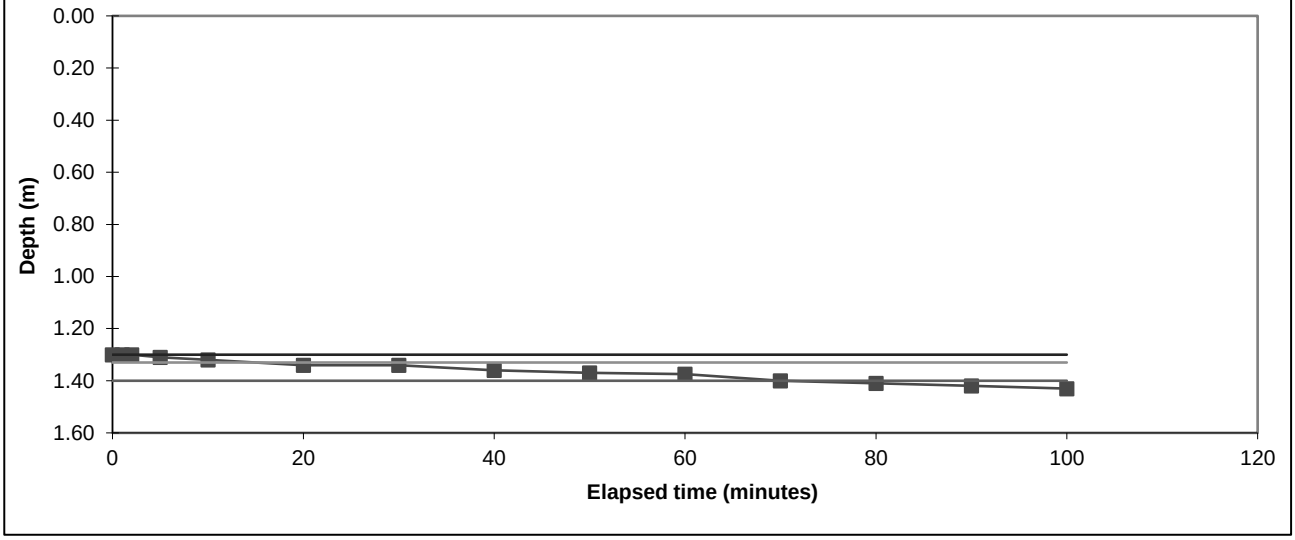
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP5 | Test No: | 1 | Date: | 30.07.2025 |
| Length (m): | 1.400 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.43 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.300 | | |
| 1 | 1.300 | | |
| 2 | 1.300 | | |
| 5 | 1.310 | | |
| 10 | 1.320 | | |
| 20 | 1.340 | | |
| 30 | 1.340 | | |
| 40 | 1.360 | | |
| 50 | 1.370 | | |
| 60 | 1.375 | | |
| 70 | 1.400 | | |
| 80 | 1.410 | | |
| 90 | 1.420 | | |
| 100 | 1.430 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.30 | | |
| 75% effective depth (mbgl): | 1.33 | Elapsed time (mins): | 15.0 |
| 50% effective depth (mbgl): | 1.37 | | |
| 25% effective depth (mbgl): | 1.40 | Elapsed time (mins): | 70.0 |
| Base of soakage zone (mbgl): | 1.43 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.029 |
| Mean surface area of outflow ($m^2$): | 0.62 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 55.0 |

| **Soil infiltration rate (m/s):** | **1.4E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
New base of pit due to silt and sand.

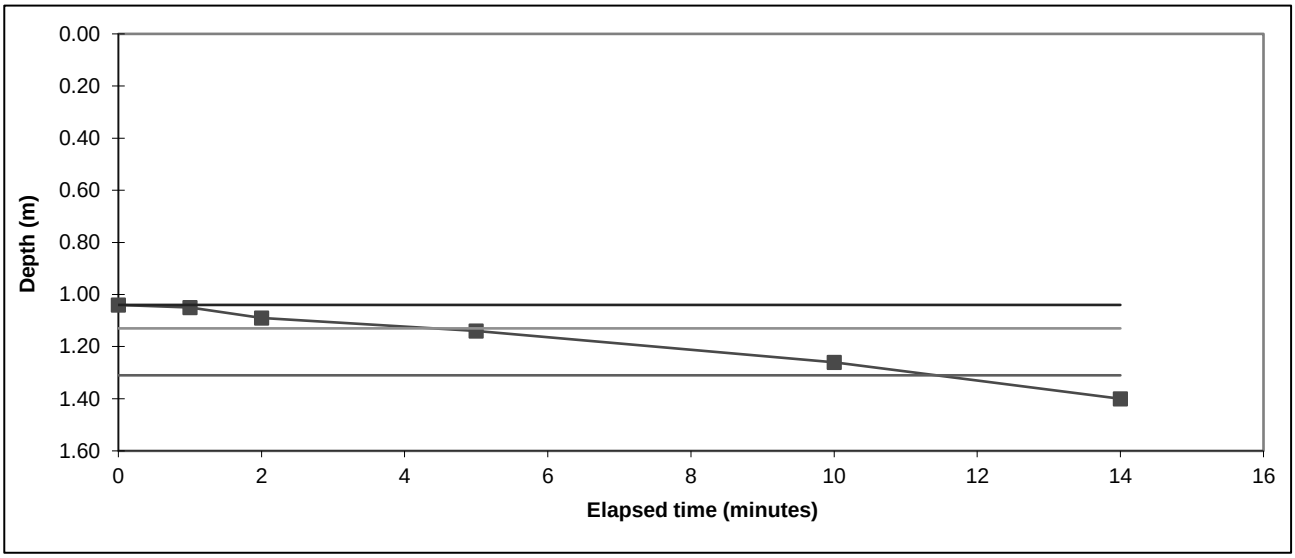
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP5 | Test No: | 2 | Date: | 30.07.2025 |
| Length (m): | 1.400 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.40 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.040 | | |
| 1 | 1.050 | | |
| 2 | 1.090 | | |
| 5 | 1.140 | | |
| 10 | 1.260 | | |
| 14 | 1.400 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.04 | | |
| 75% effective depth (mbgl): | 1.13 | Elapsed time (mins): | 4.4 |
| 50% effective depth (mbgl): | 1.22 | | |
| 25% effective depth (mbgl): | 1.31 | Elapsed time (mins): | 11.4 |
| Base of soakage zone (mbgl): | 1.40 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.076 |
| Mean surface area of outflow ($m^2$): | 1.03 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 7.0 |

| **Soil infiltration rate (m/s):** | **1.7E-4** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
New base of pit due to silt and sand.

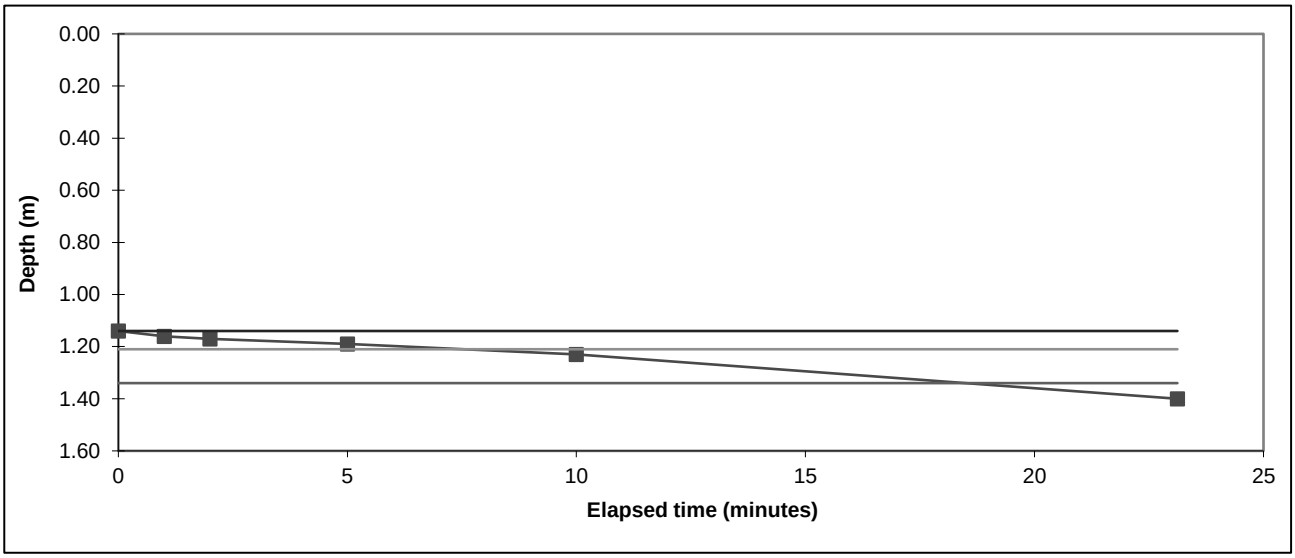
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP5 | Test No: | 3 | Date: | 30.07.2025 |
| Length (m): | 1.400 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.40 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.140 | | |
| 1 | 1.160 | | |
| 2 | 1.170 | | |
| 5 | 1.190 | | |
| 10 | 1.230 | | |
| 23.12 | 1.400 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.14 | | |
| 75% effective depth (mbgl): | 1.21 | Elapsed time (mins): | 7.5 |
| 50% effective depth (mbgl): | 1.27 | | |
| 25% effective depth (mbgl): | 1.34 | Elapsed time (mins): | 18.5 |
| Base of soakage zone (mbgl): | 1.40 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.055 |
| Mean surface area of outflow ($m^2$): | 0.86 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 11.0 |

| **Soil infiltration rate (m/s):** | **9.6E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).

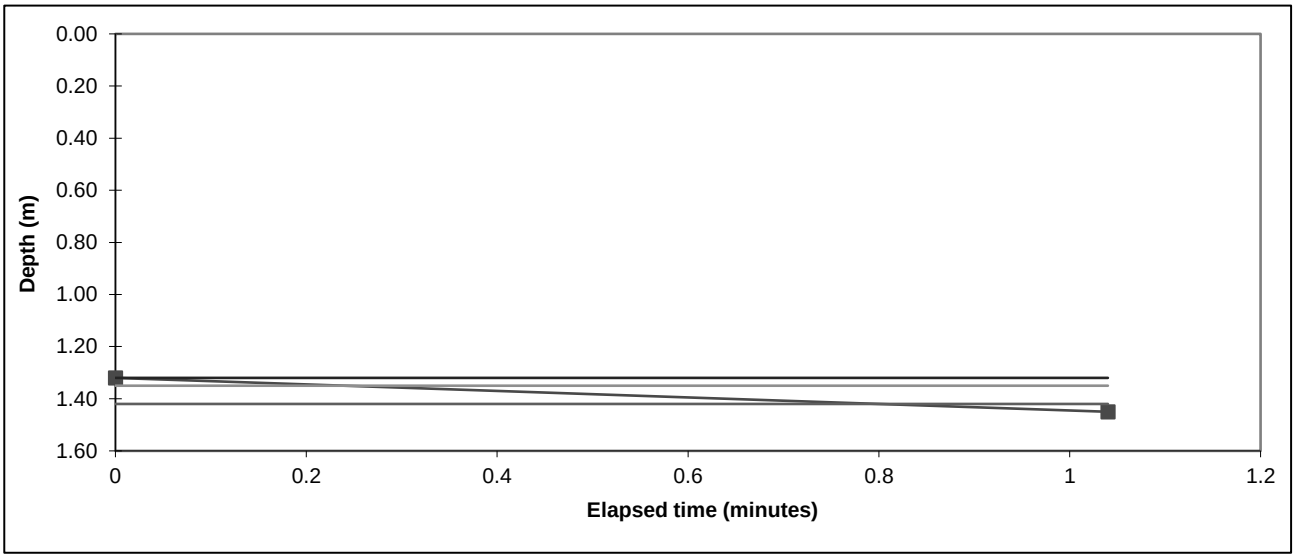
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP6 | Test No: | 1 | Date: | 30.07.2025 |
| Length (m): | 1.500 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.45 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.320 | | |
| 1.04 | 1.450 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.32 | | |
| 75% effective depth (mbgl): | 1.35 | Elapsed time (mins): | 0.2 |
| 50% effective depth (mbgl): | 1.39 | | |
| 25% effective depth (mbgl): | 1.42 | Elapsed time (mins): | 0.8 |
| Base of soakage zone (mbgl): | 1.45 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.031 |
| Mean surface area of outflow ($m^2$): | 0.67 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 0.6 |

| **Soil infiltration rate (m/s):** | **1.3E-3** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
Water appeared to drain into a sinkhole.

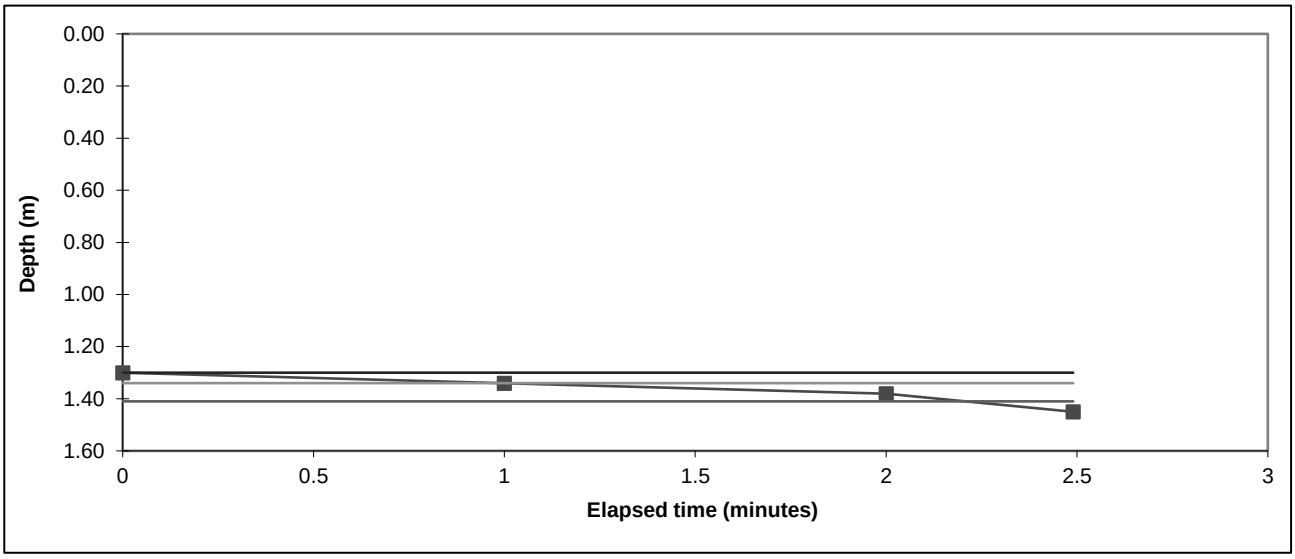
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP6 | Test No: | 2 | Date: | 30.07.2025 |
| Length (m): | 1.500 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.45 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.300 | | |
| 1 | 1.340 | | |
| 2 | 1.380 | | |
| 2.49 | 1.450 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.30 | | |
| 75% effective depth (mbgl): | 1.34 | Elapsed time (mins): | 1.0 |
| 50% effective depth (mbgl): | 1.38 | | |
| 25% effective depth (mbgl): | 1.41 | Elapsed time (mins): | 2.2 |
| Base of soakage zone (mbgl): | 1.45 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.031 |
| Mean surface area of outflow ($m^2$): | 0.70 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 1.2 |

| **Soil infiltration rate (m/s):** | **6.2E-4** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
Water appeared to drain into a sinkhole.

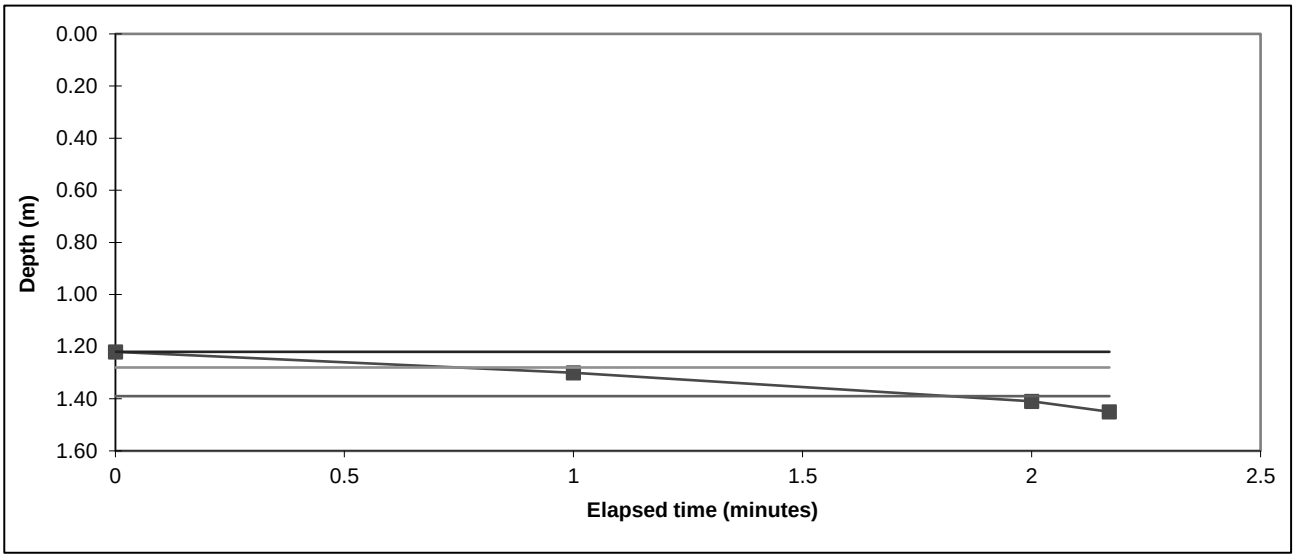
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP6 | Test No: | 3 | Date: | 30.07.2025 |
| Length (m): | 1.500 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.45 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.220 | | |
| 1 | 1.300 | | |
| 2 | 1.410 | | |
| 2.17 | 1.450 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.22 | | |
| 75% effective depth (mbgl): | 1.28 | Elapsed time (mins): | 0.8 |
| 50% effective depth (mbgl): | 1.34 | | |
| 25% effective depth (mbgl): | 1.39 | Elapsed time (mins): | 1.8 |
| Base of soakage zone (mbgl): | 1.45 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.049 |
| Mean surface area of outflow ($m^2$): | 0.85 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 1.0 |

| **Soil infiltration rate (m/s):** | **9.8E-4** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
Water appeared to drain into a sinkhole.

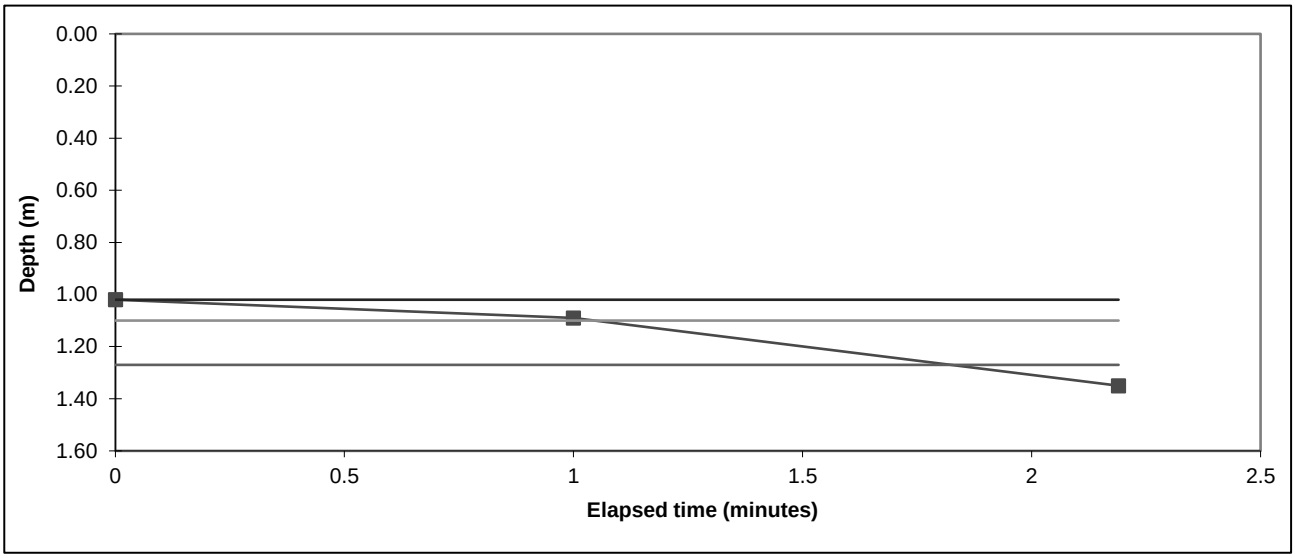
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP7 | Test No: | 1 | Date: | 31.07.2025 |
| Length (m): | 1.500 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.35 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.020 | | |
| 1 | 1.090 | | |
| 2.19 | 1.350 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.02 | | |
| 75% effective depth (mbgl): | 1.10 | Elapsed time (mins): | 1.0 |
| 50% effective depth (mbgl): | 1.19 | | |
| 25% effective depth (mbgl): | 1.27 | Elapsed time (mins): | 1.8 |
| Base of soakage zone (mbgl): | 1.35 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.077 |
| Mean surface area of outflow ($m^2$): | 1.03 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 0.8 |

| **Soil infiltration rate (m/s):** | **1.6E-3** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
Water appeared to drain into a sinkhole.

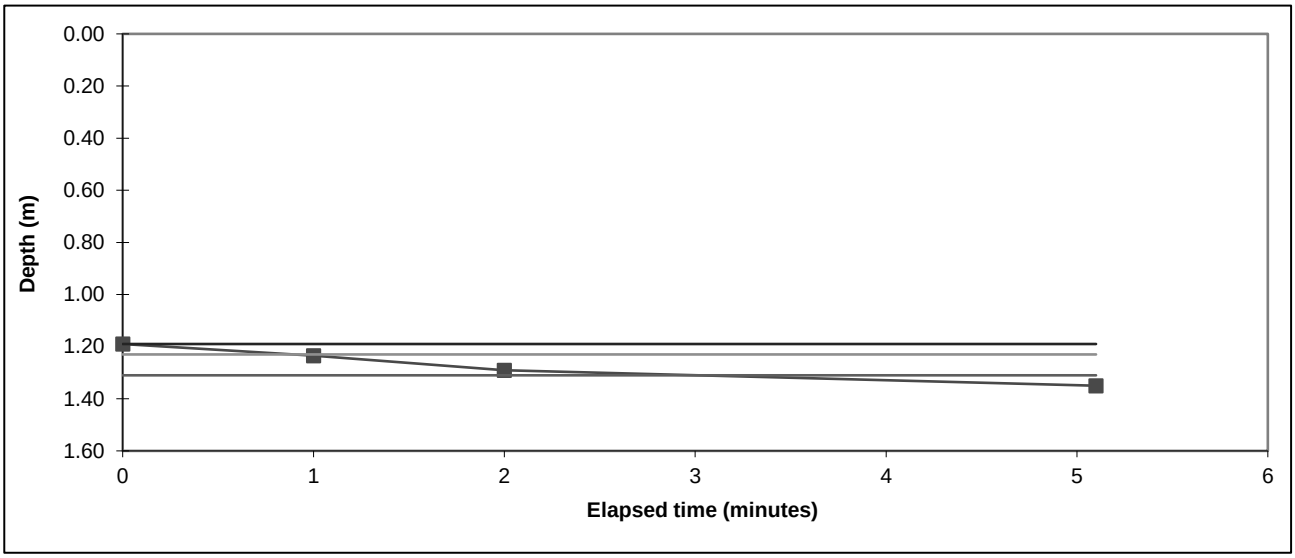
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP7 | Test No: | 2 | Date: | 31.07.2025 |
| Length (m): | 1.500 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.35 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.190 | | |
| 1 | 1.235 | | |
| 2 | 1.290 | | |
| 5.1 | 1.350 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.19 | | |
| 75% effective depth (mbgl): | 1.23 | Elapsed time (mins): | 0.9 |
| 50% effective depth (mbgl): | 1.27 | | |
| 25% effective depth (mbgl): | 1.31 | Elapsed time (mins): | 3.0 |
| Base of soakage zone (mbgl): | 1.35 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.036 |
| Mean surface area of outflow ($m^2$): | 0.74 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 2.1 |

| **Soil infiltration rate (m/s):** | **3.9E-4** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
Water appeared to drain into a sinkhole.

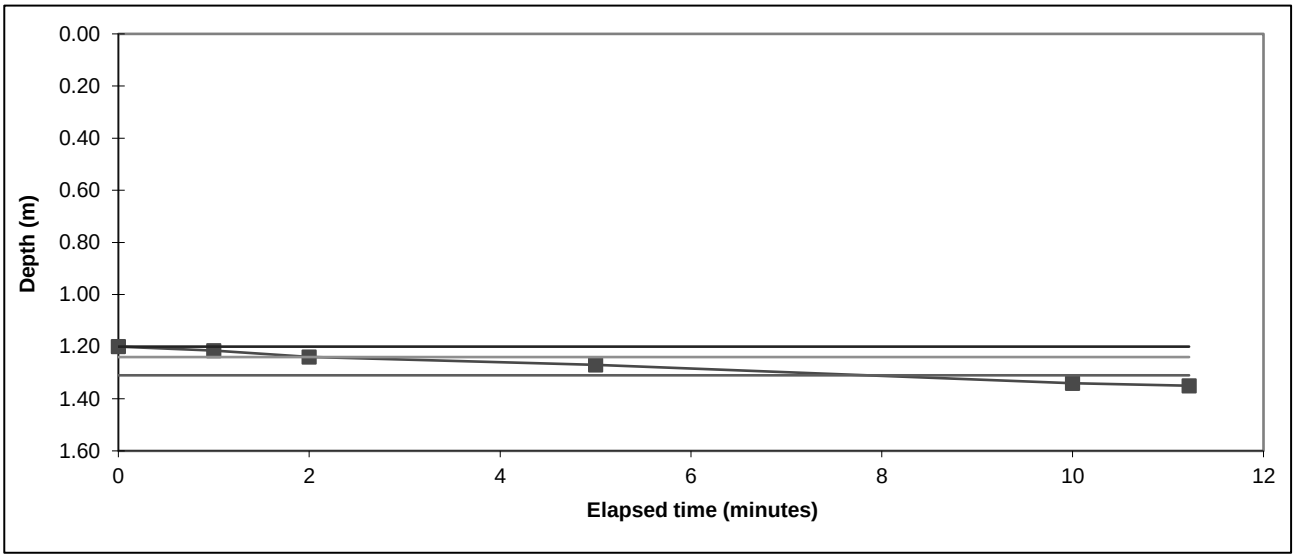
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP7 | Test No: | 1 | Date: | 31.07.2025 |
| Length (m): | 1.500 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.35 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.200 | | |
| 1 | 1.215 | | |
| 2 | 1.240 | | |
| 5 | 1.270 | | |
| 10 | 1.340 | | |
| 11.22 | 1.350 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.20 | | |
| 75% effective depth (mbgl): | 1.24 | Elapsed time (mins): | 2.0 |
| 50% effective depth (mbgl): | 1.28 | | |
| 25% effective depth (mbgl): | 1.31 | Elapsed time (mins): | 7.9 |
| Base of soakage zone (mbgl): | 1.35 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.032 |
| Mean surface area of outflow ($m^2$): | 0.70 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 5.9 |

| **Soil infiltration rate (m/s):** | **1.3E-4** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
Water appeared to drain into a sinkhole.

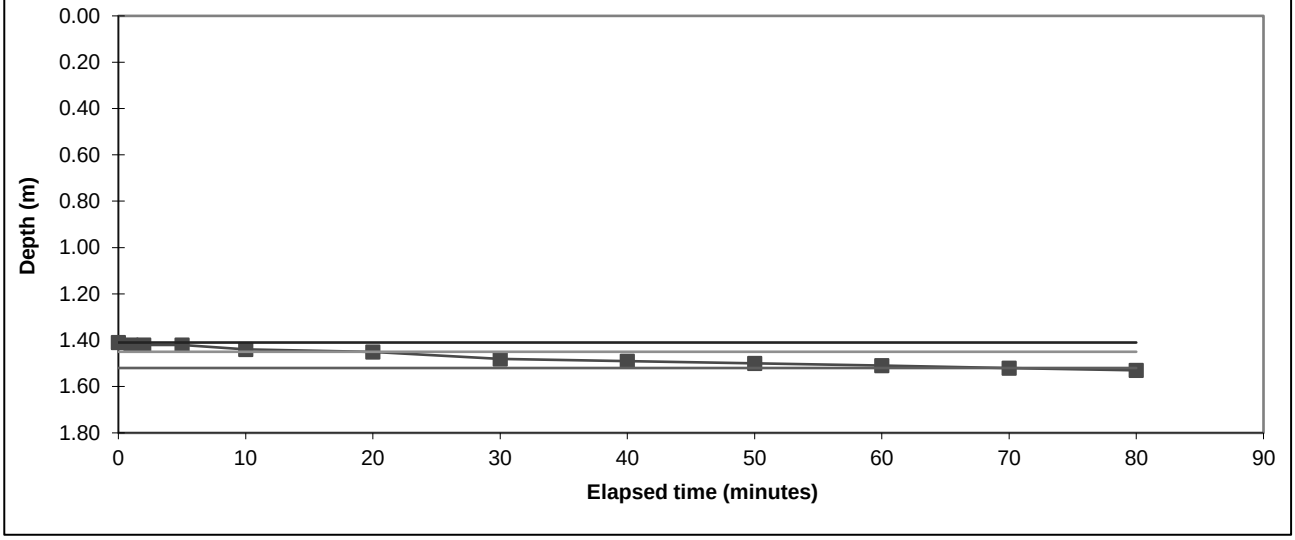
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP8 | Test No: | 1 | Date: | 31.07.2025 |
| Length (m): | 1.500 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.56 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.410 | | |
| 1 | 1.420 | | |
| 2 | 1.420 | | |
| 5 | 1.420 | | |
| 10 | 1.440 | | |
| 20 | 1.450 | | |
| 30 | 1.480 | | |
| 40 | 1.490 | | |
| 50 | 1.500 | | |
| 60 | 1.510 | | |
| 70 | 1.520 | | |
| 80 | 1.530 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.41 | | |
| 75% effective depth (mbgl): | 1.45 | Elapsed time (mins): | 20.0 |
| 50% effective depth (mbgl): | 1.49 | | |
| 25% effective depth (mbgl): | 1.52 | Elapsed time (mins): | 70.0 |
| Base of soakage zone (mbgl): | 1.56 | | |

| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.032 |
| Mean surface area of outflow ($m^2$): | 0.70 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 50.0 |

| **Soil infiltration rate (m/s):** | **1.5E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).
New base of pit due to silt and sand.

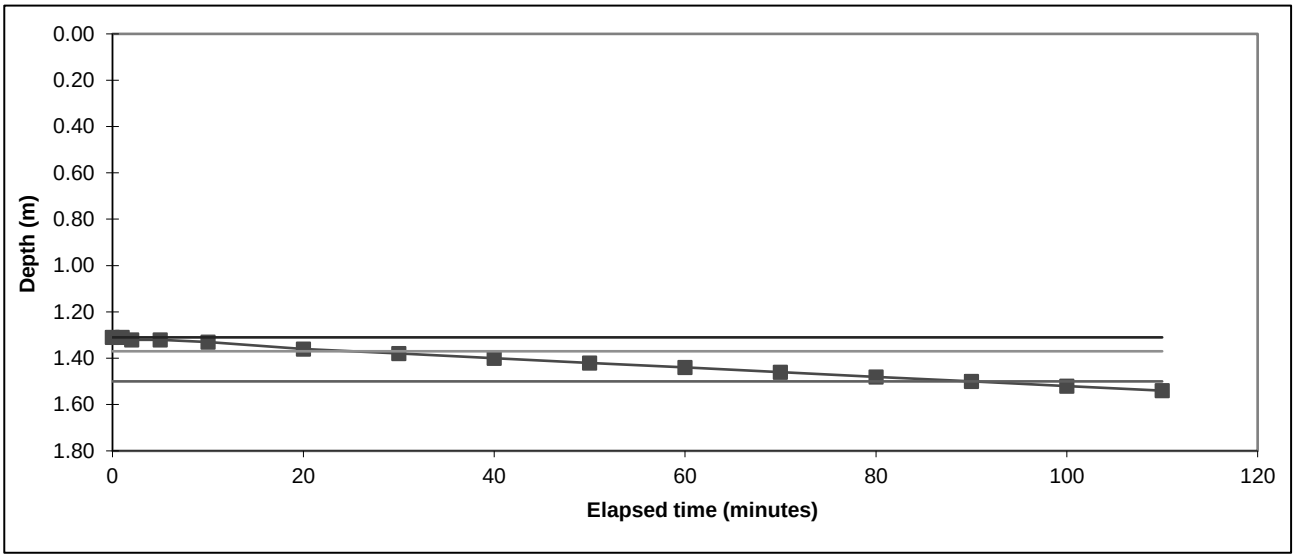
| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Rogers Geotechnical Services L

## Soakaway Test

| | | | | | |
|---|---|---|---|---|---|
| Trial Pit No: | TP8 | Test No: | 2 | Date: | 31.07.2025 |
| Length (m): | 1.500 | | Datum Height: | 0.00 | m agl |
| Width (m): | 0.30 | | Granular infill: | None | |
| Depth (m): | 1.56 | | Porosity of infill: | 1 | (assumed) |

| Elapsed time (minutes) | Water Depth (m below datum) | Elapsed time (minutes) | Water Depth (m below datum) |
|---|---|---|---|
| 0 | 1.310 | 110 | 1.540 |
| 1 | 1.310 | | |
| 2 | 1.320 | | |
| 5 | 1.320 | | |
| 10 | 1.330 | | |
| 20 | 1.360 | | |
| 30 | 1.380 | | |
| 40 | 1.400 | | |
| 50 | 1.420 | | |
| 60 | 1.440 | | |
| 70 | 1.460 | | |
| 80 | 1.480 | | |
| 90 | 1.500 | | |
| 100 | 1.520 | | |




| | | | |
|---|---|---|---|
| Start water depth for analysis (mbgl): | 1.31 | | |
| 75% effective depth (mbgl): | 1.37 | Elapsed time (mins): | 25.0 |
| 50% effective depth (mbgl): | 1.44 | | |
| 25% effective depth (mbgl): | 1.50 | Elapsed time (mins): | 90.0 |
| Base of soakage zone (mbgl): | 1.56 | | |

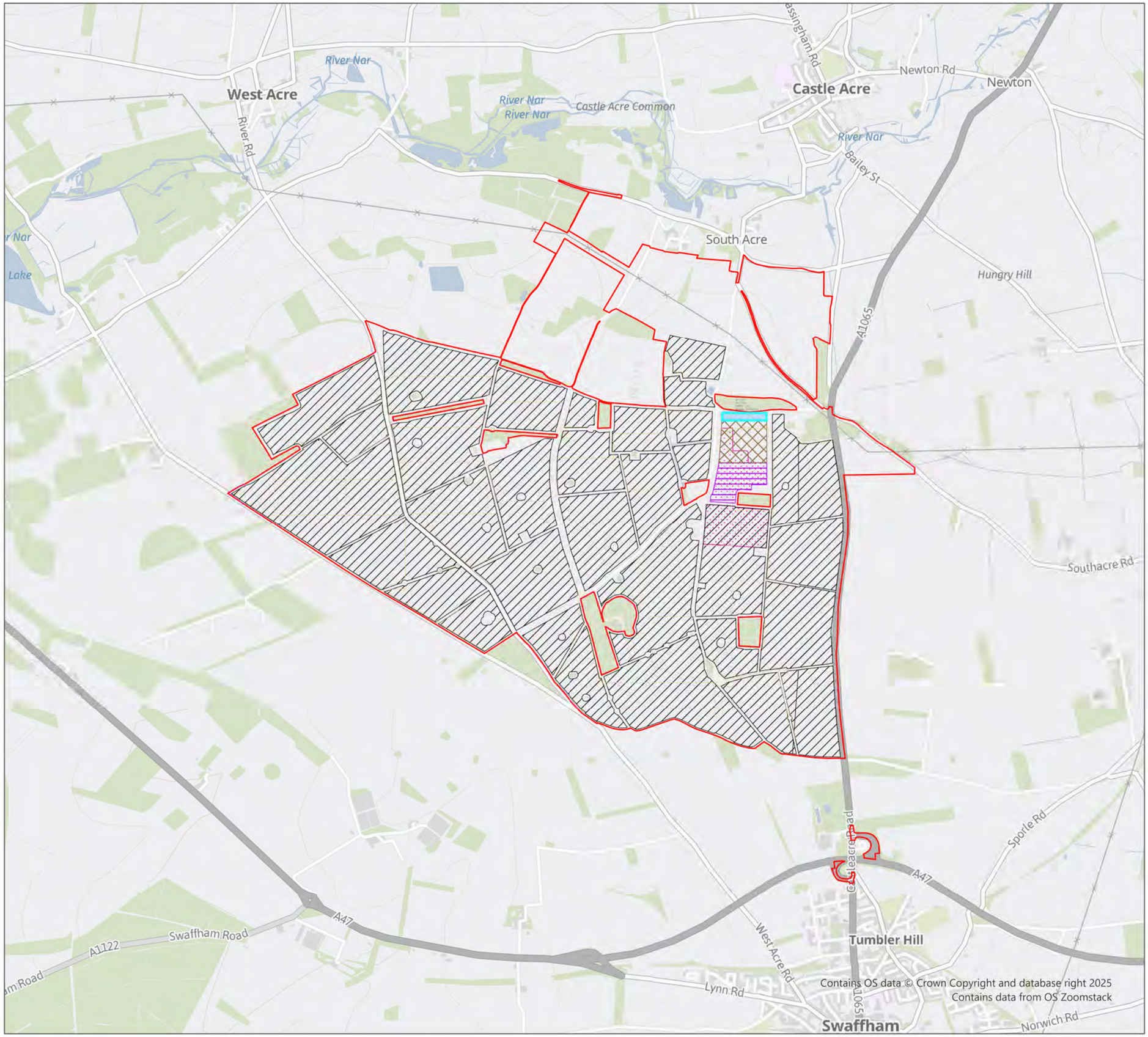
| | |
|---|---|
| Volume outflow between 75% and 25% effective depth ($m^3$): | 0.058 |
| Mean surface area of outflow ($m^2$): | 0.88 |
| (side area at 50% effective depth + base area) | |
| Time for outflow between 75% and 25% effective depth (mins): | 65.0 |

| **Soil infiltration rate (m/s):** | **1.7E-5** |
|---|---|

**Remarks** Results processed following BRE 365 (2007).

| | | |
|---|---|---|
| **Client:** | Raincloud Consulting Ltd | **Job No:** |
| **Site:** | Swaffham Road, Swaffham, Norfolk, PE37 7HY | C5239/25/E/8044 |

# Annex C: Outline Surface Water Attenuation Area




THE DROVES
SOLAR FARM
RAINCLOUD

- Order Limits / Core Study Area
- Work No. 1: Solar PV
- Work No. 2: BESS Compound
- Work No. 3: Customer Substation
- Work No. 4: National Substation
- Proposed Track
- Surface Water Attenuation Area

1:25,000 Scale @ A3

0 0.5 1 km

N

| Ref: 083-SWD-003 | Date: 17/11/2025 |
|---|---|

**Outline Surface Water Attenuation Area**
**Annex C**

**The Droves Solar Farm**
**Flood Risk Assessment**

# Annex D: InfoDrainage Results

| The Droves: | Date: 11/09/2025 | | |
|---|---|---|---|
| | Designed by: EL | Checked by: LN | Approved By: LN |
| Report Details: Type: Inflows Storm Phase: 1.5mBasin | www.raincloud-consulting.co.uk: | | |

**Catchment Area 1**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 14.262 |

## Preliminary Sizing

| | |
|---|---|
| Volumetric Runoff Coefficient | 1.000 |
| Percentage Impervious (%) | 100 |
| Time of Concentration (mins) | 5 |

## Dynamic Sizing

| Runoff Method | Time of Concentration |
|---|---|
| Summer Volumetric Runoff | 1.000 |
| Winter Volumetric Runoff | 1.000 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |

**Catchment Area 2**

Type : Catchment Area

| | |
|---|---|
| Area (ha) | 11.084 |

## Preliminary Sizing

| | |
|---|---|
| Volumetric Runoff Coefficient | 1.000 |
| Percentage Impervious (%) | 100 |
| Time of Concentration (mins) | 5 |

## Dynamic Sizing

| Runoff Method | Time of Concentration |
|---|---|
| Summer Volumetric Runoff | 1.000 |
| Winter Volumetric Runoff | 1.000 |
| Time of Concentration (mins) | 5 |
| Percentage Impervious (%) | 100 |

**Pond**

Type : Pond

## Dimensions

| | |
|---|---|
| Exceedance Level (m) | 51.500 |
| Depth (m) | 1.500 |
| Base Level (m) | 50.000 |
| Freeboard (mm) | 0 |
| Initial Depth (m) | 0.000 |
| Porosity (%) | 100 |
| Average Slope (1:X) | 4.014 |
| Total Volume (m³) | 24909.021 |

| Depth (m) | Area (m²) | Volume (m³) |
|---|---|---|
| 0.000 | 15250.00 | 0.000 |
| 1.500 | 18000.00 | 24909.021 |

## Inlets

### Inlet

| | |
|---|---|
| Inlet Type | Point Inflow |
| Incoming Item(s) | Catchment Area 1 |
| Bypass Destination | (None) |
| Capacity Type | No Restriction |

### Inlet (1)

| | |
|---|---|
| Inlet Type | Point Inflow |
| Incoming Item(s) | Catchment Area 2 |
| Bypass Destination | (None) |
| Capacity Type | No Restriction |

## Advanced

| | |
|---|---|
| Base Infiltration Rate (m/hr) | 0.043 |
| Side Infiltration Rate (m/hr) | 0.043 |
| Safety Factor | 1.5 |
| Perimeter | Circular |
| Length (m) | 224.931 |
| Friction Scheme | Manning's n |
| n | 0.035 |

| The Droves: | Date: 11/09/2025 | | |
|---|---|---|---|
| | Designed by: EL | Checked by: LN | Approved By: LN |
| Report Details: Type: Inflow Summary Storm Phase: 1.5mBasin | www.raincloud-consulting.co.uk: | | |

| Inflow Label | Connected To | Flow (L/s) | Runoff Method | Area (ha) | Percentage Impervious (%) | Urban Creep (%) | Adjusted Percentage Impervious (%) | Area Analysed (ha) |
|---|---|---|---|---|---|---|---|---|
| Catchment Area 1 | Pond | | Time of Concentration | 14.262 | 100 | 0 | 100 | 14.262 |
| Catchment Area 2 | Pond | | Time of Concentration | 11.084 | 100 | 0 | 100 | 11.084 |
| **TOTAL** | | **0.0** | | **25.346** | | | | **25.346** |

| The Droves: | Date: 11/09/2025 | | |
|---|---|---|---|
| | Designed by: EL | Checked by: LN | Approved By: LN |
| Report Details: Type: Network Design Criteria Storm Phase: 1.5mBasin | www.raincloud-consulting.co.uk: | | |

## Flow Options

| | |
|---|---|
| Peak Flow Calculation | (UK) Modified Rational Method |
| Min. Time of Entry (mins) | 5 |
| Max. Travel Time (mins) | 30 |

## Pipe Options

| | |
|---|---|
| Lock Slope Options | None |
| Design Options | Minimise Excavation |
| Design Level | Level Soffits |
| Min. Cover Depth (m) | 1.200 |
| Min. Slope (1:X) | 500.00 |
| Max. Slope (1:X) | 40.00 |
| Min. Velocity (m/s) | 1.0 |
| Max. Velocity (m/s) | 3.0 |
| Use Flow Restriction | ☐ |
| Reduce Channel Depths | ☐ |

## Manhole Options

| | |
|---|---|
| Apply Offset | ☐ |

| The Droves: | Date: 11/09/2025 | | |
|---|---|---|---|
| | Designed by: EL | Checked by: LN | Approved By: LN |
| Report Title: Rainfall Analysis Criteria | www.raincloud-consulting.co.uk: | | |

| | |
|---|---|
| Runoff Type | Dynamic |
| Output Interval (mins) | 5 |
| Time Step | Default |
| Urban Creep | Apply Global Value |
| Urban Creep Global Value (%) | 0 |
| Junction Flood Risk Margin (mm) | 300 |
| Perform No Discharge Analysis | ☐ |

| The Droves: | Date: 11/09/2025 | | |
|---|---|---|---|
| | Designed by: EL | Checked by: LN | Approved By: LN |
| Report Details: Type: Inflows Summary Storm Phase: 1.5mBasin | www.raincloud-consulting.co.uk: | | |

**Critical Storm Per Item: Rank By: Max. Inflow**

| Inflow | Storm Event | Inflow Area (ha) | Max. Inflow (L/s) | Total Inflow Volume (m³) |
|---|---|---|---|---|
| Catchment Area 1 | FEH: 100 years: +40 %: 15 mins: Summer | 14.26 | 12803.8 | 5769.399 |
| Catchment Area 2 | FEH: 100 years: +40 %: 15 mins: Summer | 11.08 | 9951.0 | 4483.900 |

| The Droves: | Date: 11/09/2025 | | |
|---|---|---|---|
| | Designed by: EL | Checked by: LN | Approved By: LN |
| Report Details: Type: Stormwater Controls Summary Storm Phase: 1.5mBasin | www.raincloud-consulting.co.uk: | | |

**Critical Storm Per Item: Rank By: Max. Avg. Depth**

| Stormwater Control | Storm Event | Max. US Level (m) | Max. DS Level (m) | Max. US Depth (m) | Max. DS Depth (m) | Max. Inflow (L/s) | Max. Resident Volume (m³) | Max. Flooded Volume (m³) | Total Lost Volume (m³) | Max. Outflow (L/s) | Total Discharge Volume (m³) | Percentage Available (%) | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pond | FEH: 100 years: +40 %: 960 mins: Winter | 51.472 | 51.472 | 1.472 | 1.472 | 1387.2 | 24404.129 | 0.000 | 15353.863 | 0.0 | 0.000 | 2.027 | OK |

| The Droves: | Date: 11/09/2025 | | |
|---|---|---|---|
| | Designed by: EL | Checked by: LN | Approved By: LN |
| Report Details: Type: Phase Management Storm Phase: 1.5mBasin | www.raincloud-consulting.co.uk: | | |

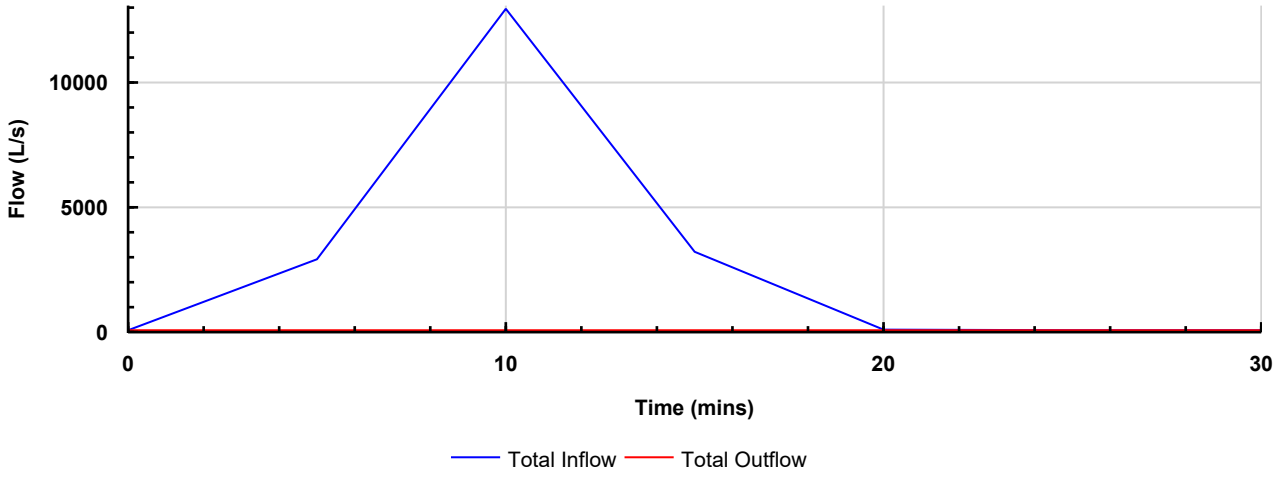
**1.5mBasin**
**FEH: 30 years: Increase Rainfall (%): +0: 15 mins: Summer**

## Tables

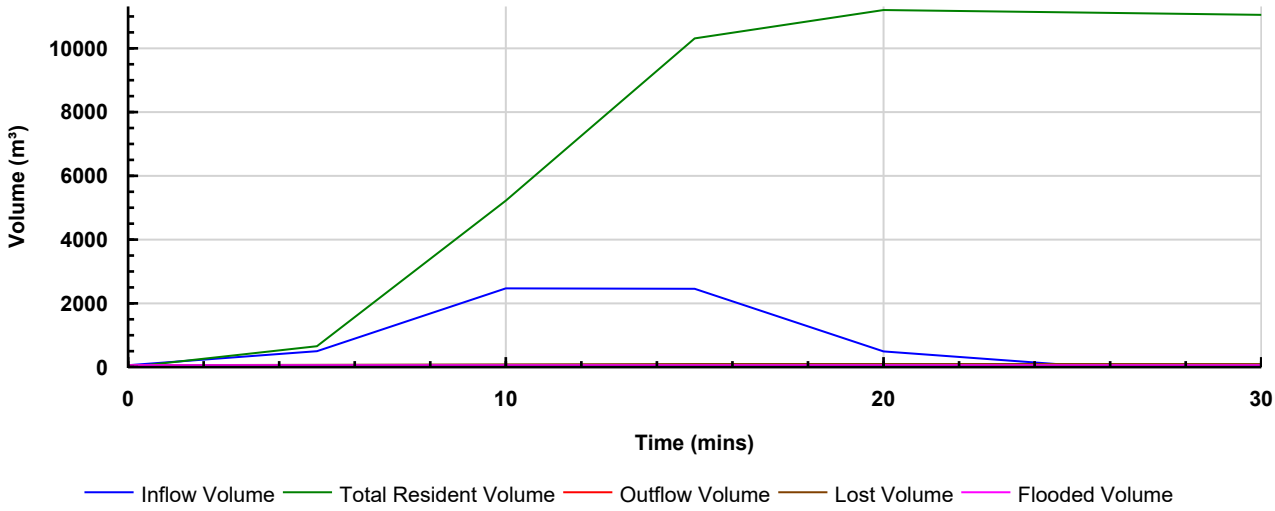
| Name | Max. Inflow (L/s) | Total Inflow Volume (m³) | Max. Outflow (L/s) | Total Outflow Volume (m³) |
|---|---|---|---|---|
| TOTAL | 12950.9 | 5710.912 | 0.0 | 0.000 |

## Graphs

**Flow Graph**




**Volume Graph**



**Catchment Area 1**
**Critical Storm: FEH: 100 years: Increase Rainfall (%): +40: 15 mins: Summer**

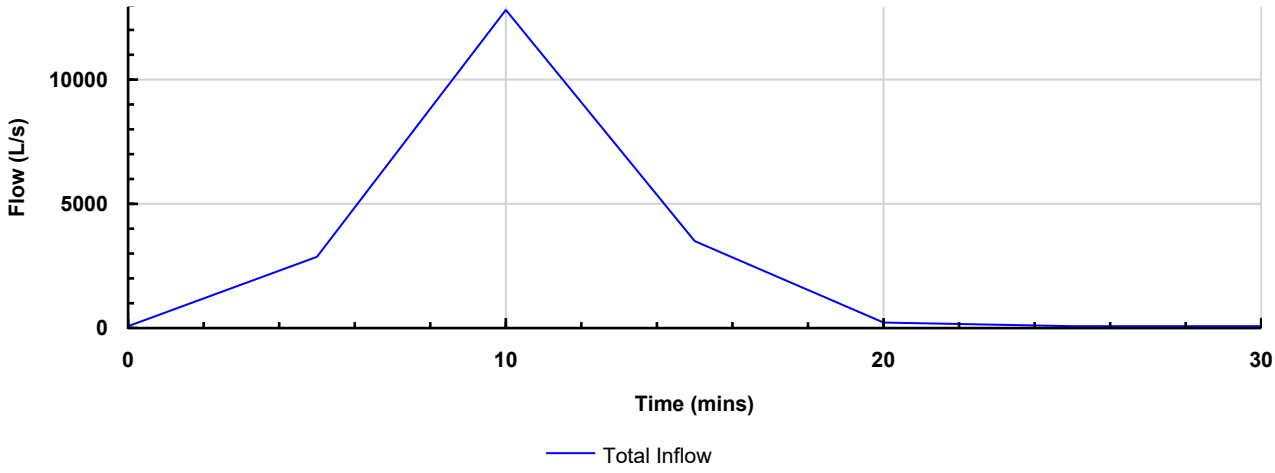
Type : Catchment Area

## Inflow

| | |
|---|---|
| Max. Inflow (L/s) | 12803.8 |
| Total Inflow Volume (m³) | 5769.399 |

## Graphs

**Flow Graph**



| The Droves: | Date: 11/09/2025 | | |
|---|---|---|---|
| | Designed by: EL | Checked by: LN | Approved By: LN |
| Report Details: Type: Inflow Results Storm Phase: 1.5mBasin | www.raincloud-consulting.co.uk: | | |

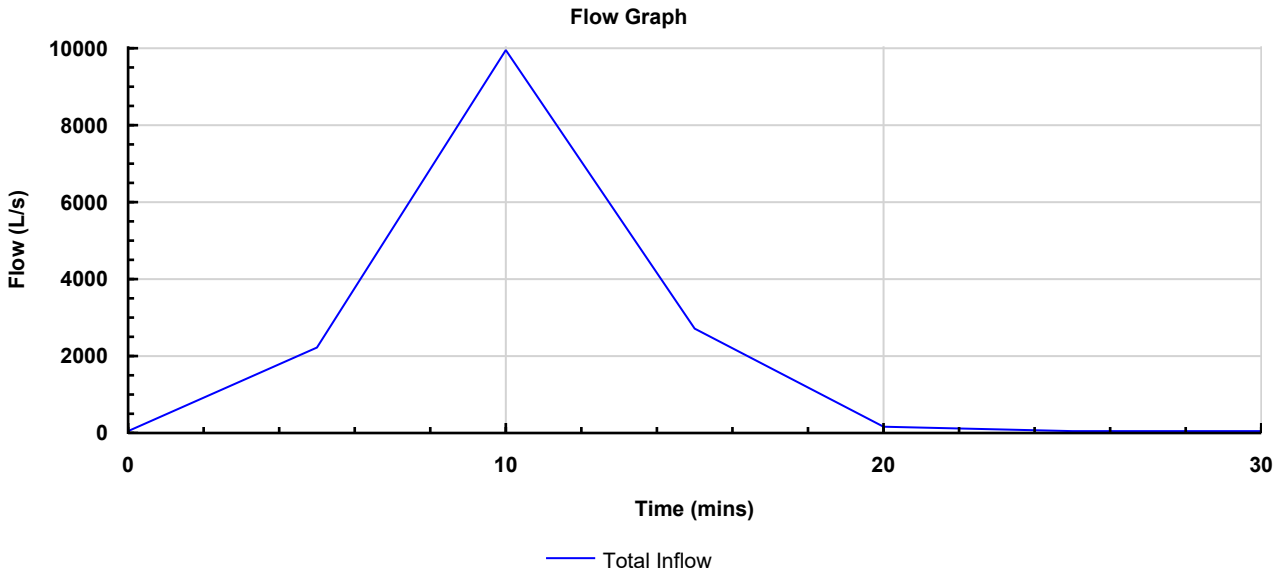
**Catchment Area 2**
**Critical Storm: FEH: 100 years: Increase Rainfall (%): +40: 15 mins: Summer**

Type : Catchment Area

## Inflow

| | |
|---|---|
| Max. Inflow (L/s) | 9951.0 |
| Total Inflow Volume (m³) | 4483.900 |

## Graphs

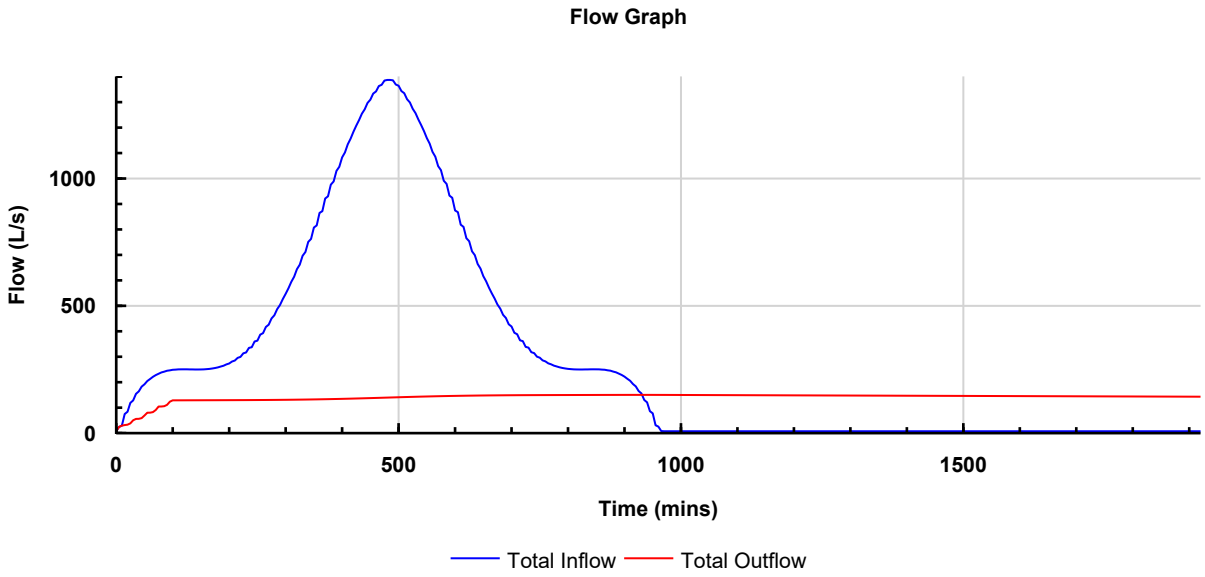


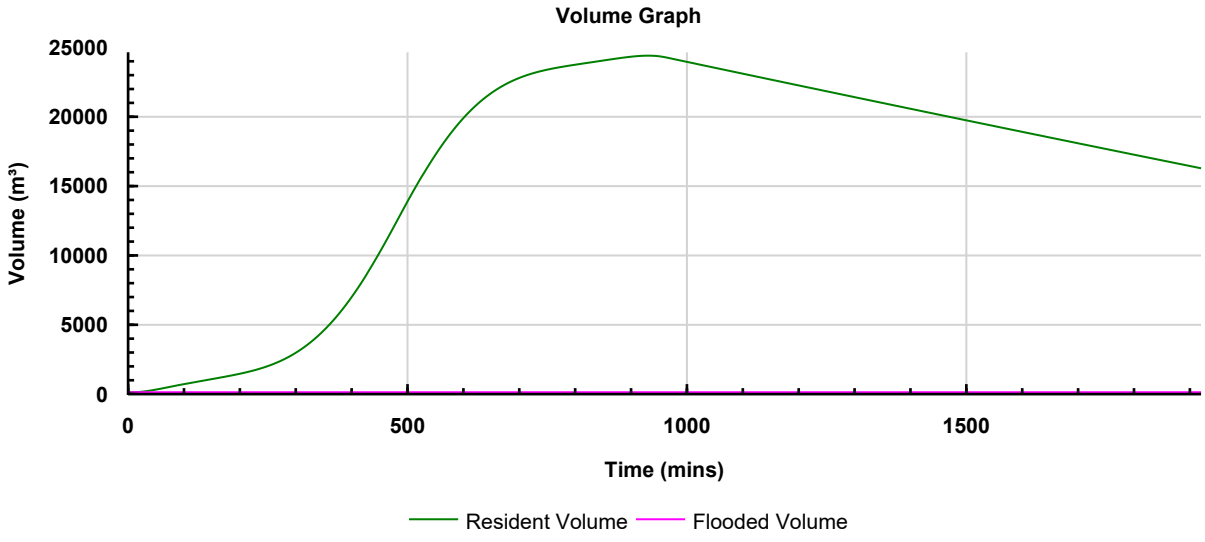
| The Droves: | Date: 11/09/2025 | | |
|---|---|---|---|
| | Designed by: EL | Checked by: LN | Approved By: LN |
| Report Details: Type: Stormwater Control Results Storm Phase: 1.5mBasin | www.raincloud-consulting.co.uk: | | |

**Pond**
**Critical Storm: FEH: 100 years: Increase Rainfall (%): +40: 960 mins: Winter**

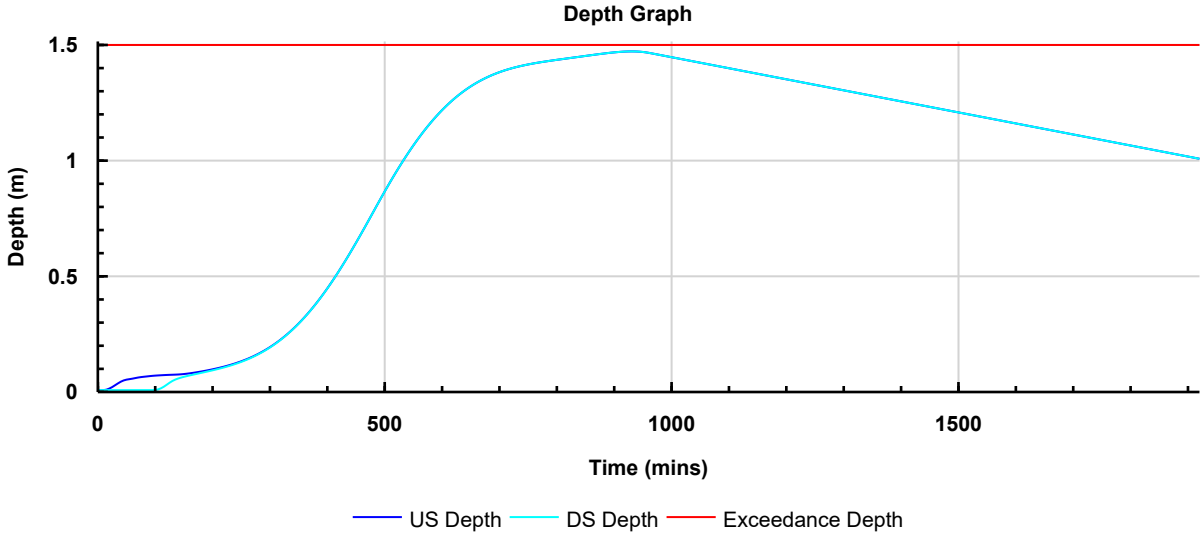
Type : Pond

## Graphs

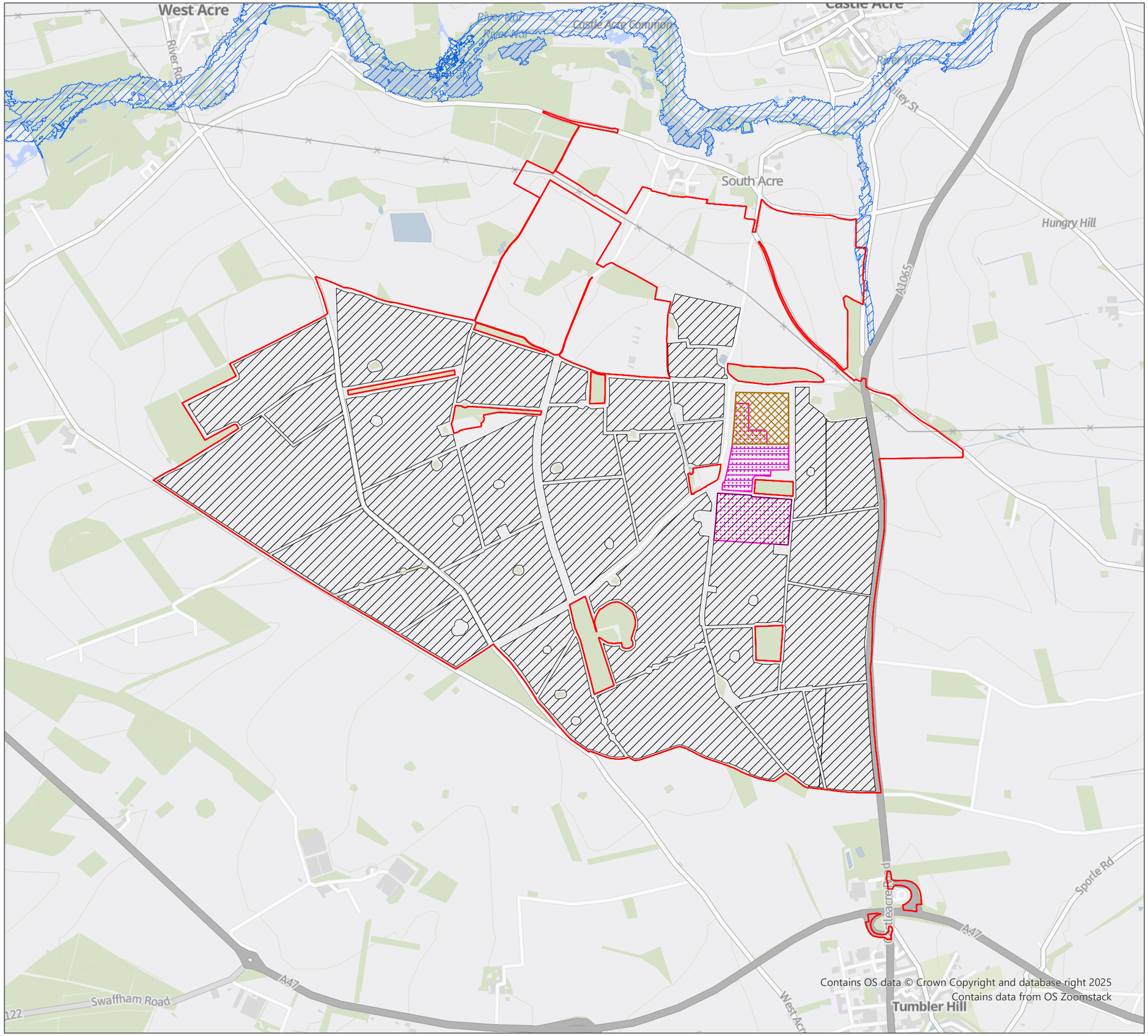


| The Droves: | Date: 11/09/2025 | | |
|---|---|---|---|
| | Designed by: EL | Checked by: LN | Approved By: LN |
| Report Details: Type: Stormwater Control Results Storm Phase: 1.5mBasin | www.raincloud-consulting.co.uk: | | |



# Annex E: A3 Scale Figures




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

NaFRA2 Flood Zones

Flood Zone

FZ2

FZ3

Work No. 1: Solar PV

Work No. 2: BESS Compound

Work No. 3: Customer Substation

Work No. 4: National Grid Substation

1:21,214 Scale @ A3

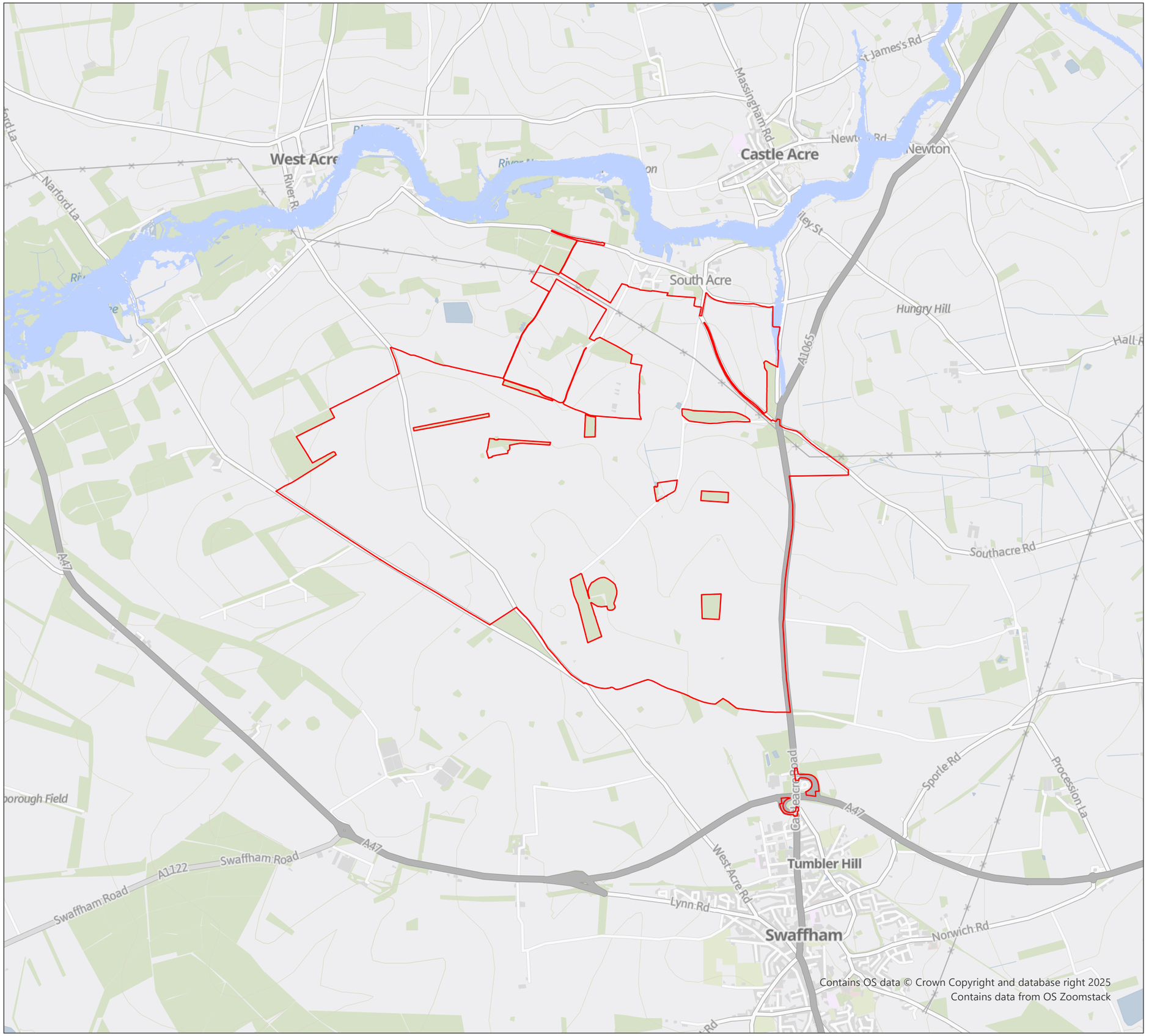
0 0.35 0.7 km

N

| Ref: 083-FRA-002B | Date: 17/11/2025 |
|---|---|

**Flood Zones**
Figure A12-1-1

**The Droves Solar Farm**
**Flood Risk Assessment**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

1 % AEP 2036 - 2069

1:30,000 Scale @ A3

0 0.5 1 km

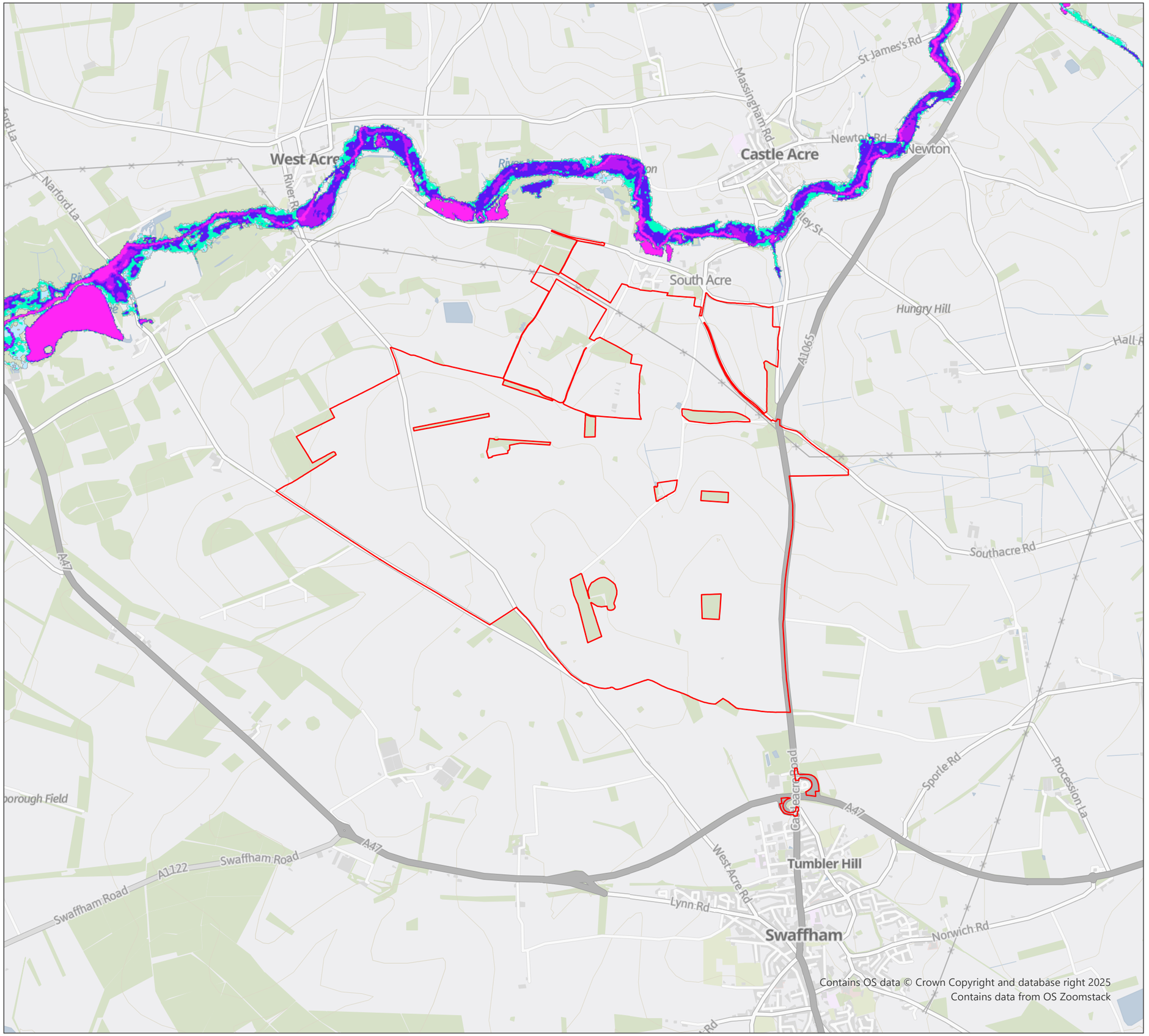
N

| Ref: 083-FRA-003B | Date: 30/09/2025 |
|---|---|

**NaFRA2 Flood Map 2036-2069 (reproduced from the Rivers and Sea map - EA)**

Figure A12-1-2

**The Droves Solar Farm**
**Flood Risk Assessment**






THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

Upper Nar 0.1 % AEP

Depth (m)

- 0.02 - 0.1
- 0.11 - 0.3
- 0.31 - 0.6
- 0.61 - 0.9
- > 0.9

1:30,000 Scale @ A3

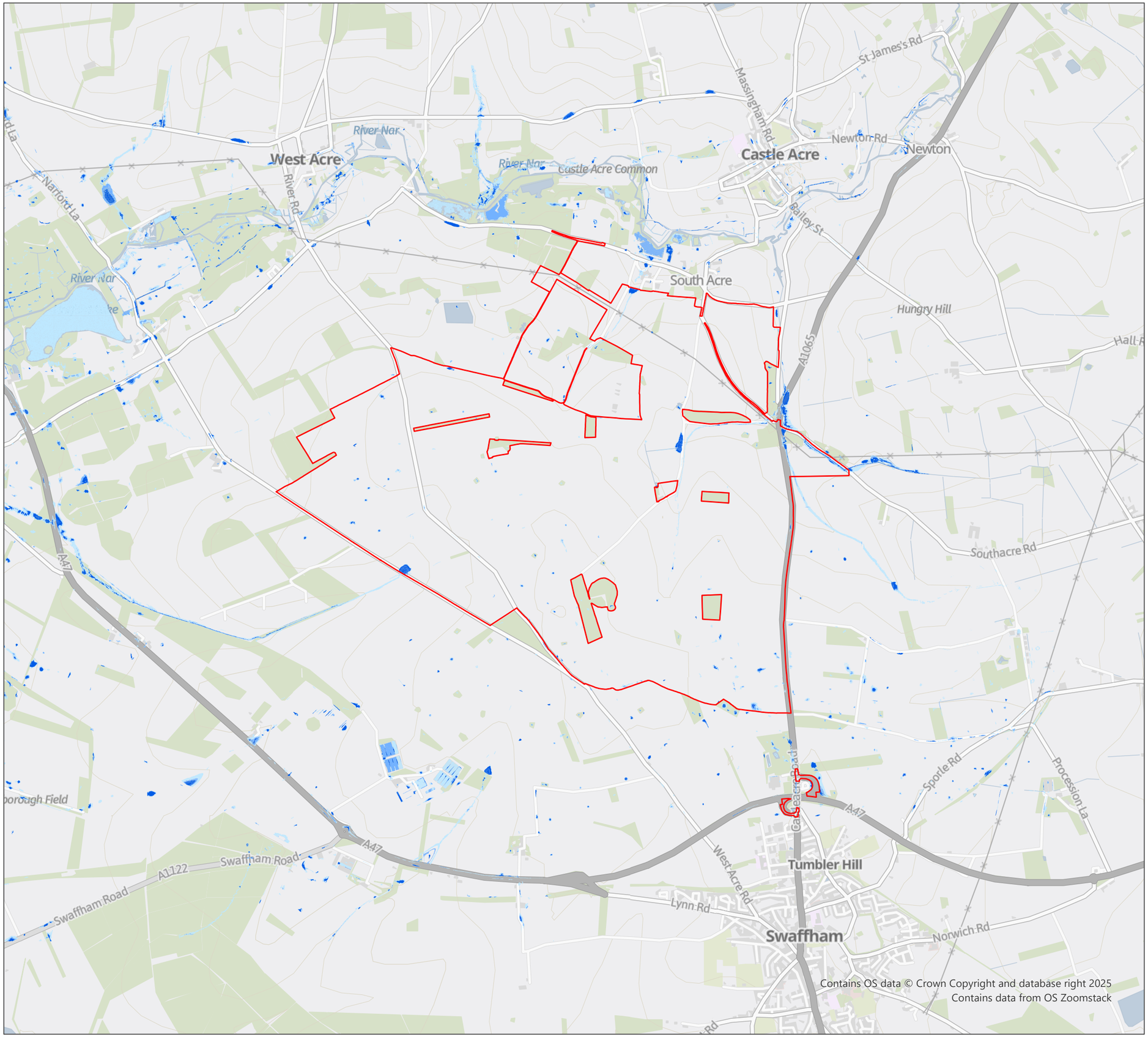
0 0.5 1 km

N

| Ref: 083-FRA-004B | Date: 30/09/2025 |
|---|---|

**River Nar - 0.1% AEP**
**Fluvial Flood Depths**
Figure A12-1-3

**The Droves Solar Farm**
**Flood Risk Assessment**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

EA Risk of Surface Water Flooding

Risk Band

- High
- Medium
- Low

1:30,000 Scale @ A3

0 0.5 1 km

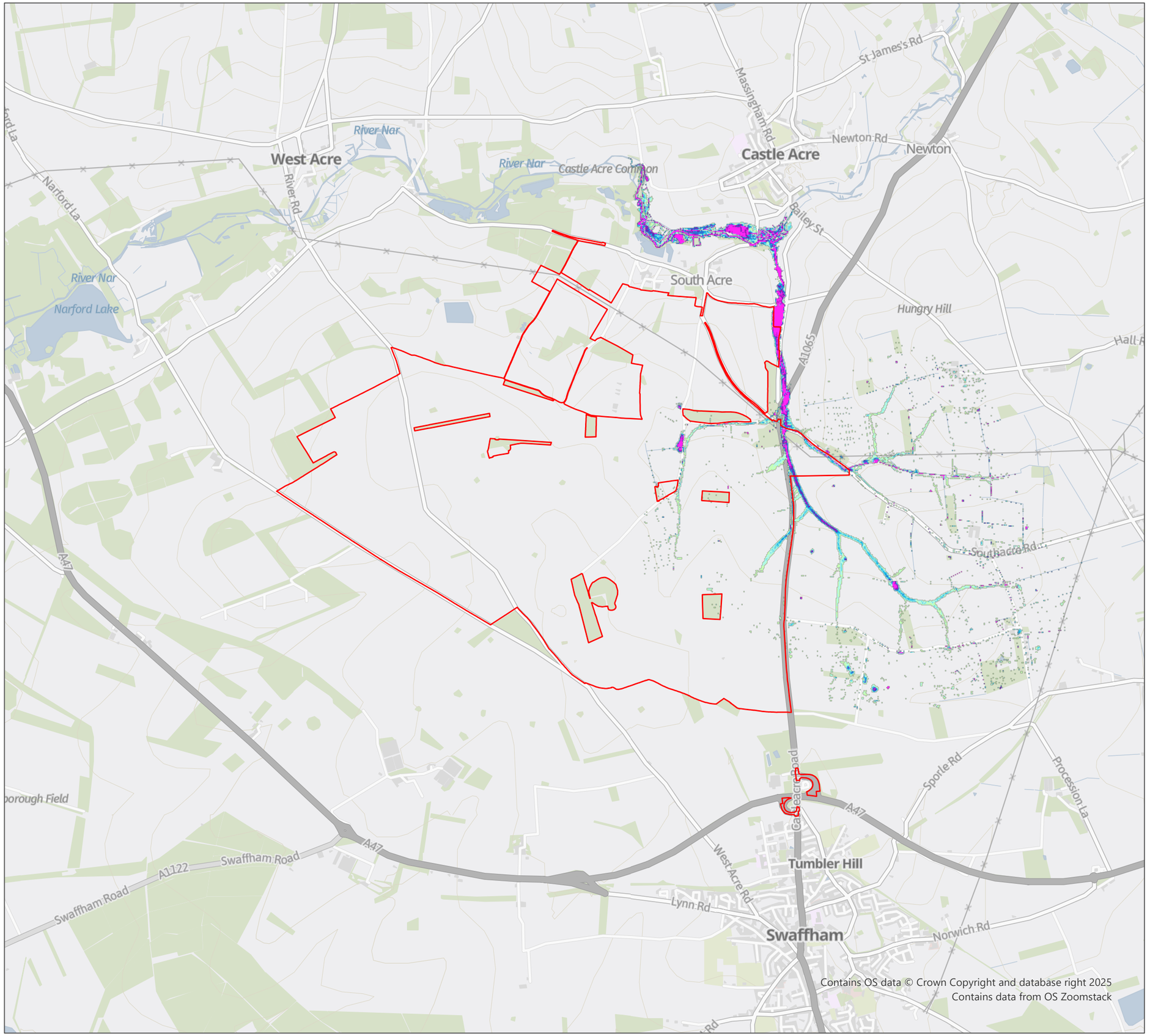
N

| Ref: 083-FRA-005B | Date: 30/09/2025 |
|---|---|

**1 % AEP Pluvial Flood Extents (EA - RoFSW 2025)**

Figure A12-1-4

**The Droves Solar Farm**
**Flood Risk Assessment**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

1 % AEP - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:30,000 Scale @ A3

0 0.55 1.1 km

N

| Ref: 083-FRA-006B | Date: 30/09/2025 |
|---|---|

**1 % AEP Flood Depths - Raincloud 2D Modelling**

Figure A12-1-5

**The Droves Solar Farm Flood Risk Assessment**

THE DROVES
SOLAR FARM
RAINCLOUD

- Order Limits / Core Study Area
- Work No. 1: Solar PV
- Work No. 2: BESS Work Area
- Work No. 3: Customer Substation
- Work No. 4: National Grid Substation

1 % AEP + 25 % CC - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.1
- 0.101 - 0.15
- 0.151 - 0.2
- 0.201 - 0.25
- 0.251 - 0.3
- 0.301 - 0.35
- 0.351 - 0.4
- 0.401 - 0.45
- > 0.45

1:30,000 Scale @ A3

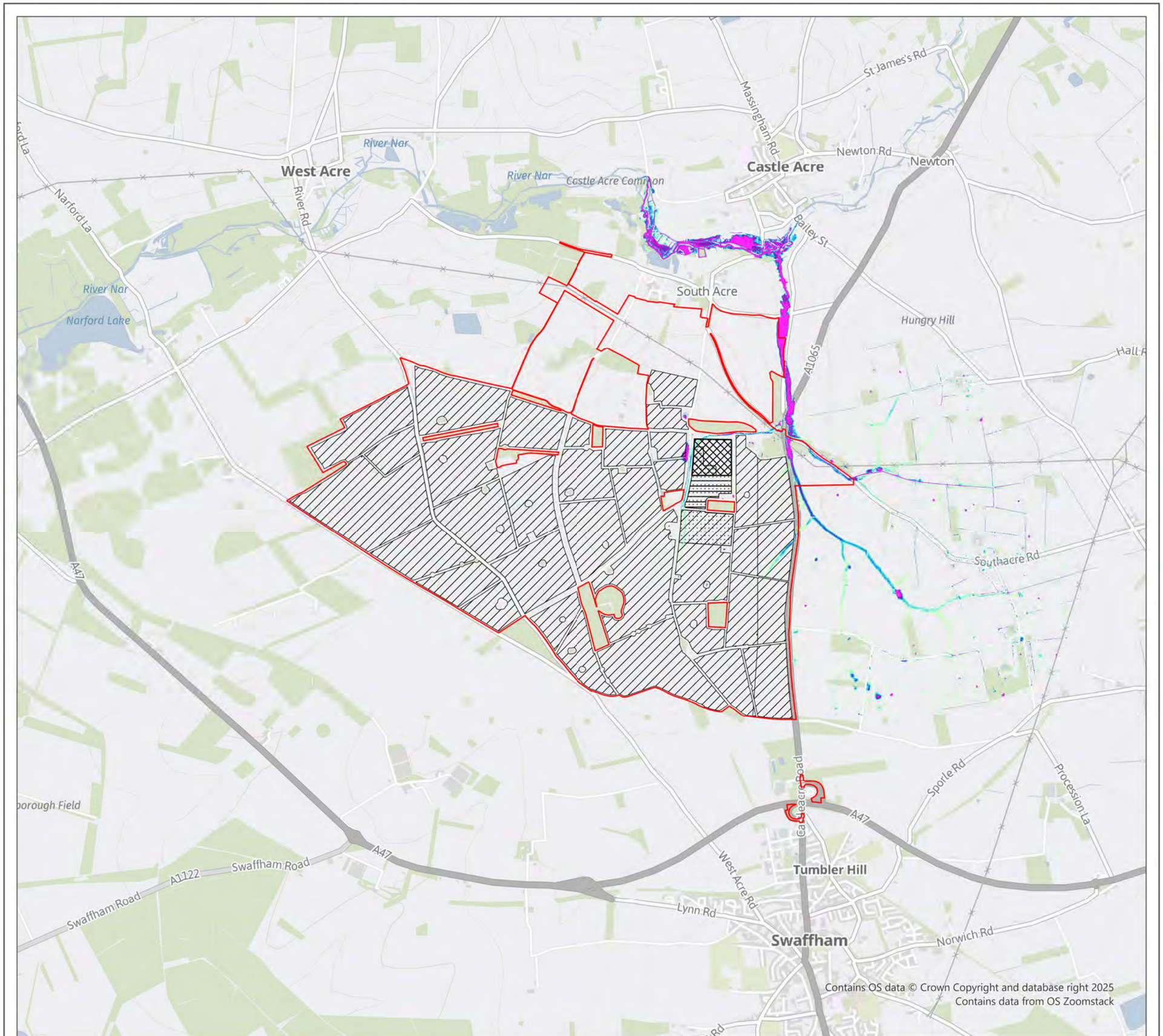
0 0.5 1 km

N

| Ref: 083-FRA-007B | Date: 17/11/2025 |
|---|---|

**1 % AEP + 25 % CC Flood Depths - Raincloud 2D Modelling**
Figure A12-1-6

**The Droves Solar Farm**
**Flood Risk Assessment**




THE DROVES
SOLAR FARM
RAINCLOUD

- Order Limits / Core Study Area
- Work No. 1: Solar PV
- Work No. 2: BESS Work Area
- Work No. 3: Customer Substation
- Work No. 4: National Grid Substation

1 % AEP + 25 % CC - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.1
- 0.101 - 0.15
- 0.151 - 0.2
- 0.201 - 0.25
- 0.251 - 0.3
- 0.301 - 0.35
- 0.351 - 0.4
- 0.401 - 0.45
- > 0.45

1:30,000 Scale @ A3

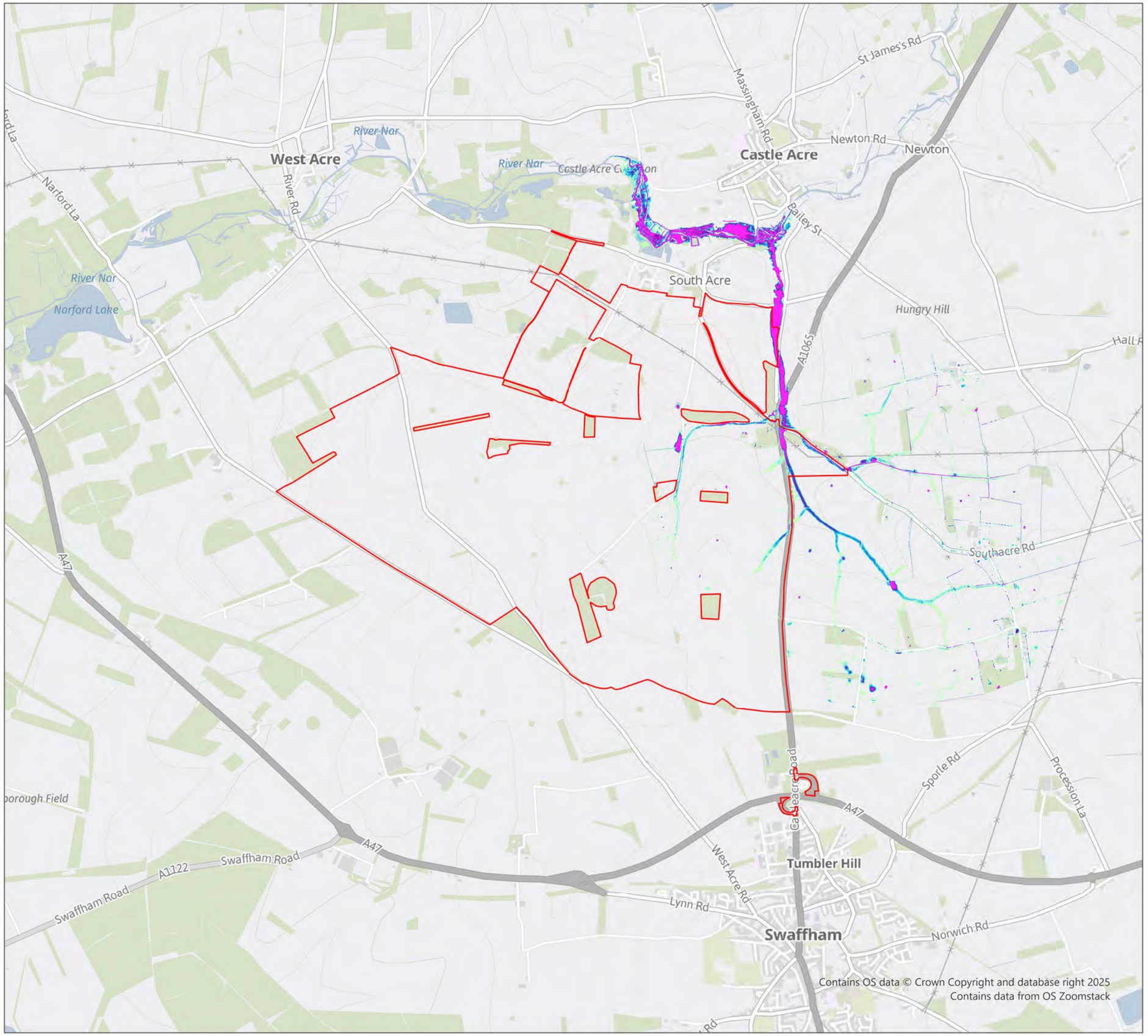
0 0.5 1 km

N

| Ref: 083-FRA-008B | Date: 17/11/2025 |
|---|---|

**Modelled 1 % AEP + 25 % CC Pluvial Flood Depth**
**Figure A12-1-8**

**The Droves Solar Farm**
**Flood Risk Assessment**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

1 % AEP + 40 % CC - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:30,000 Scale @ A3

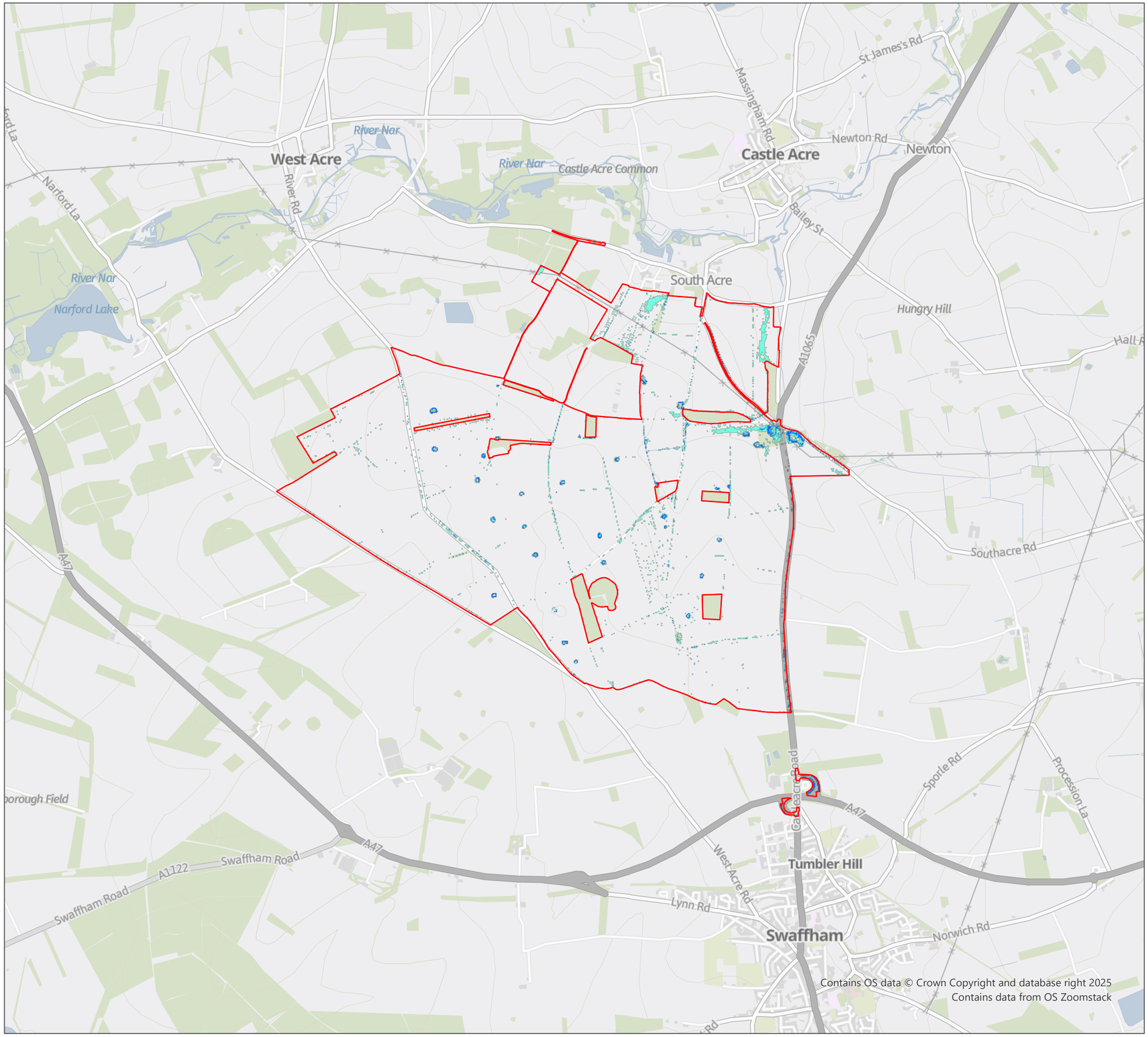
0 0.5 1 km

N

| Ref: 083-FRA-009B | Date: 17/11/2025 |
|---|---|

**1 % AEP + 40 % CC Flood Depths - Raincloud 2D Modelling**
Figure A12-1-7

**The Droves Solar Farm**
**Flood Risk Assessment**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

Slope
%

0.001 - 6

6.001 - 12

> 12.001

1:30,000 Scale @ A3

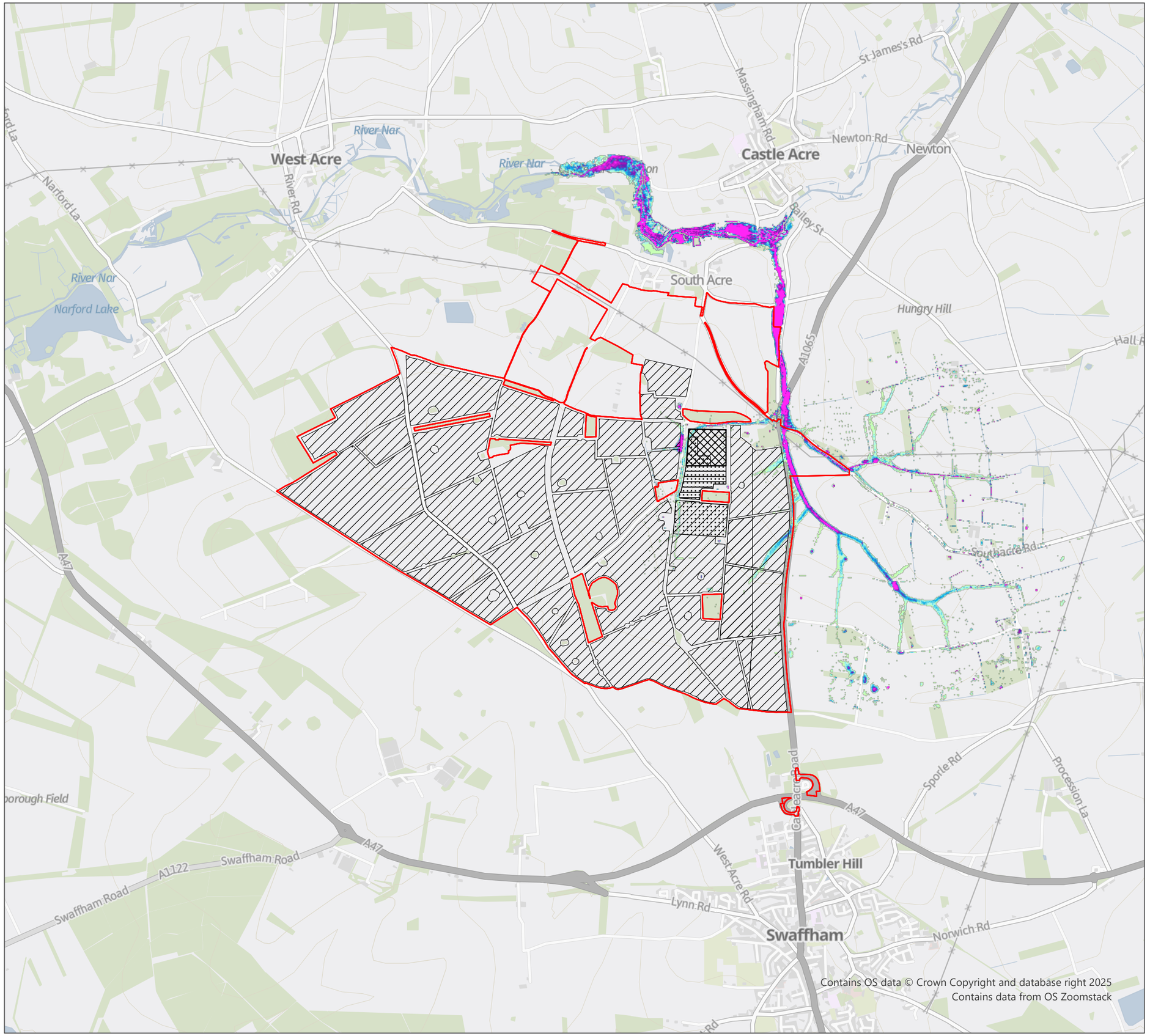
0 0.5 1 km

N

| Ref: 083-FRA-010B | Date: 30/09/2025 |
|---|---|

**Slope of CSA**
Figure A12-1-10

**The Droves Solar Farm**
**Flood Risk Assessment**




THE DROVES
SOLAR FARM
RAINCLOUD

- Work No. 1: Solar PV
- Work No. 2: BESS
- Work No. 3: Customer Substation
- Work No. 4: National Grid Substation

1 % AEP + 40 % CC - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:30,000 Scale @ A3

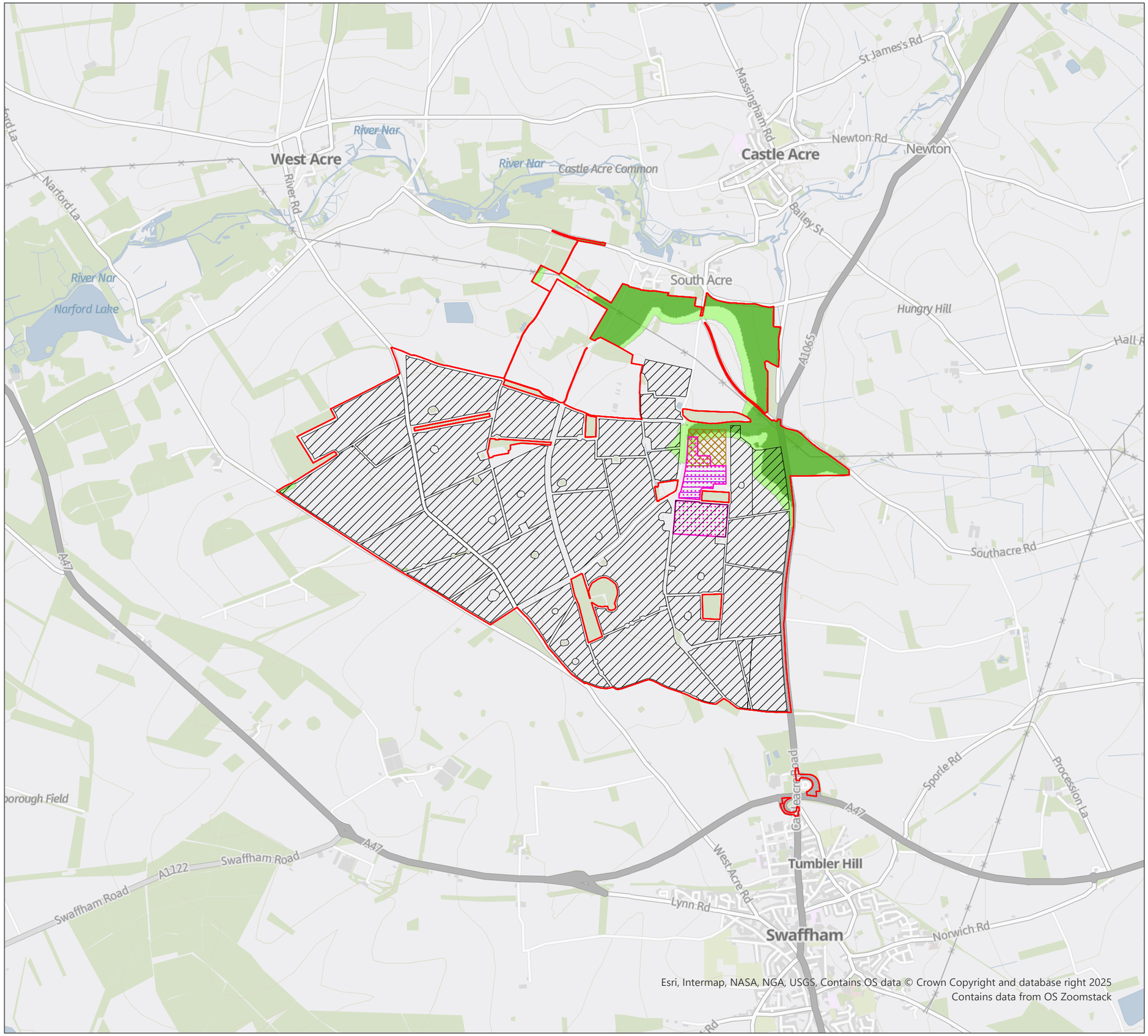
0 0.5 1 km

N

| Ref: 083-FRA-012B | Date: 17/11/2025 |
|---|---|

**Modelled 1 % AEP + 40 % CC Pluvial Flood Depth**
Figure A12-1-9

**The Droves Solar Farm**
**Flood Risk Assessment**




THE DROVES
SOLAR FARM
RAINCLOUD

- Order Limits / Core Study Area
- Work No. 1: Solar PV
- Work No. 2: BESS Compound
- Work No. 3: Customer Substation
- Work No. 4: National Grid Substation

Minimum Groundwater Depth

Depth (m BGL)

- < 12
- 12 - 15
- > 15

1:30,000 Scale @ A3

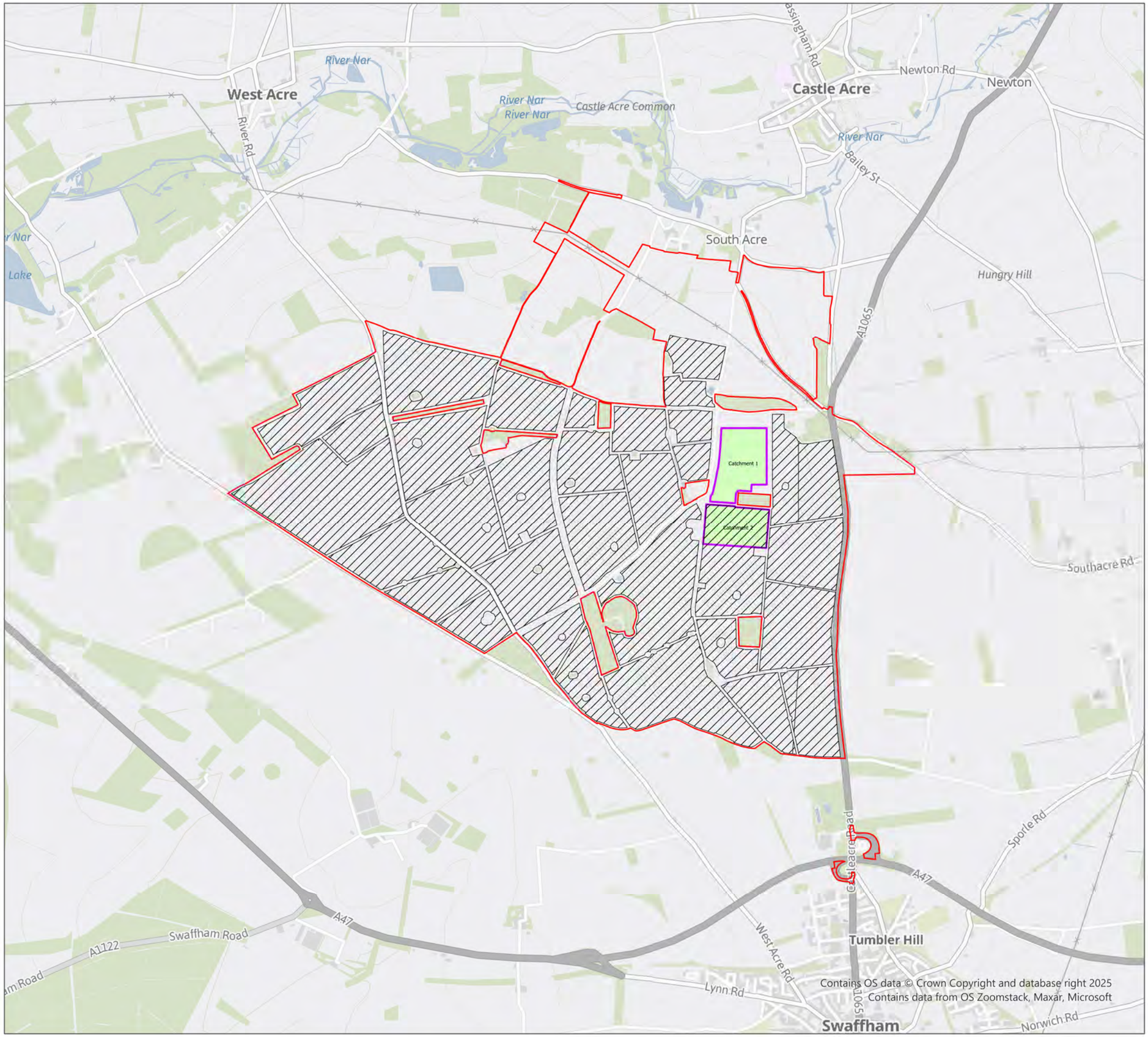
0 0.5 1 km

N

| Ref: 083-FRA-015B2 | Date: 17/11/2025 |
|---|---|

**Minimum Groundwater Depths**
Figure 12-1-11

**The Droves Solar Farm**
**Flood Risk Assessment**




THE DROVES
SOLAR FARM
RAINCLOUD

- Order Limits / Core Study Area
- Work No. 1: Solar PV
- Impermeable Area
- Catchment

1:25,000 Scale @ A3

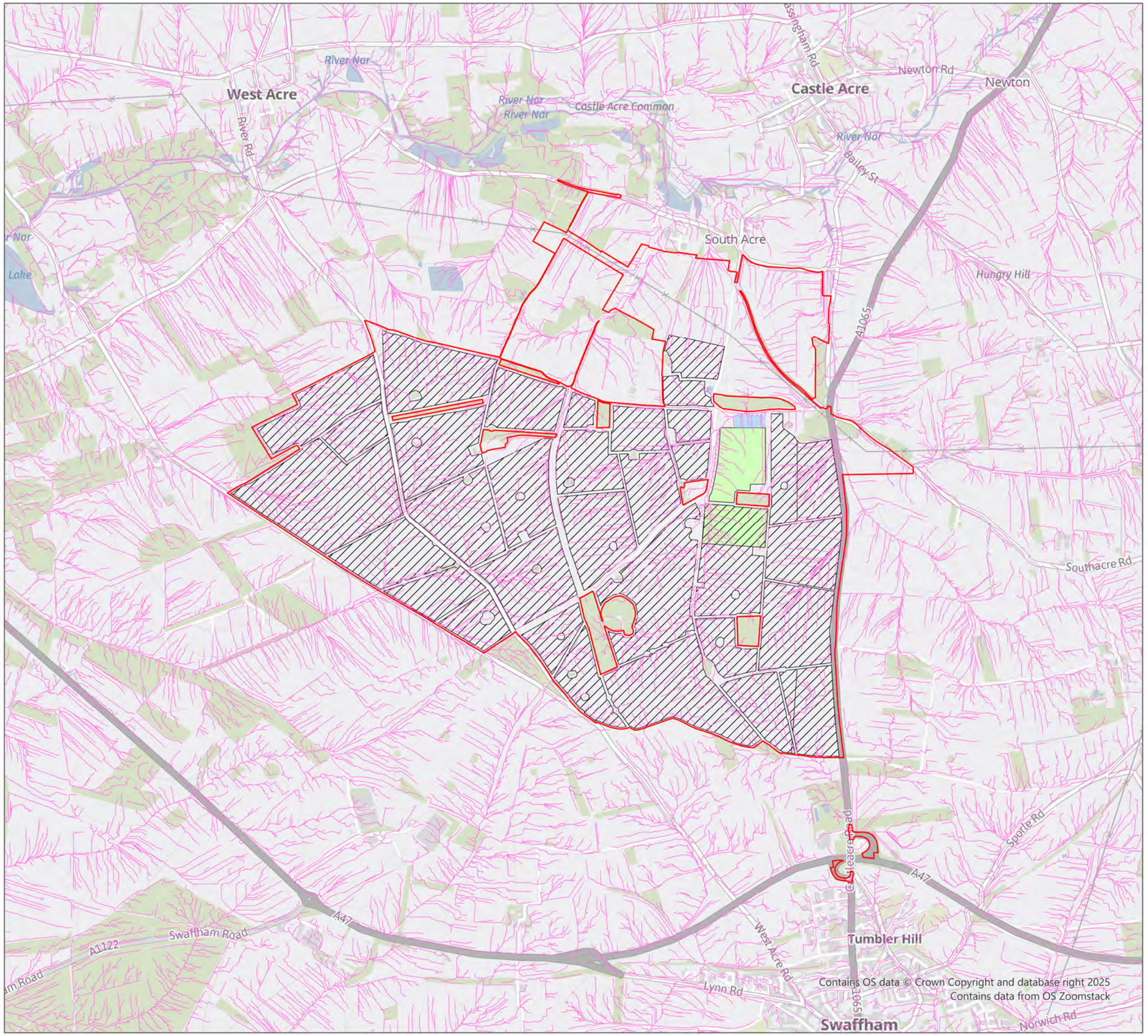
0 0.5 1 km

N

| Ref: C83-SWD-001A | Date: 01/10/2025 |
|---|---|

**Contributing Catchments and Impermeable Areas**
Figure A12-1-12

**The Droves Solar Farm**
**Flood Risk Assessment**




THE DROVES
SOLAR FARM
RAINCLOUD

- Order Limits / Core Study Area
- Work No. 1: Solar PV
- Impermeable Area
- Proposed Attenuation Basin Area
- Flow Pathway

1:25,000 Scale @ A3

0 0.5 1 km

N

| Ref: 083-SWD-002A | Date: 01/10/2025 |
|---|---|

**Exceedance Pathways**
Figure A12-1-13

**The Droves Solar Farm**
**Flood Risk Assessment**

# Annex F: 2D Modelling Report

# The Droves Solar Farm

## Environmental Statement (ES)

## Volume 4, Annex F: Pluvial Flood Modelling Report

Date: November 2025

Planning Inspectorate Reference: EN0110013
Document Reference: APP/6.4
APFP Regulation 5(2)(a)

## Issue Sheet

Report Prepared for: The Droves Solar Farm Limited.
DCO Submission

## Appendix F - Pluvial Flood Modelling Report

| Prepared by: Raincloud Consulting | | | |
|---|---|---|---|
| Approved by: Island Green Power | | | |
| Revision | Date | Technical lead (Initials): | Approved by (Initials): |
| Final v 0.1 | 19/10/2025 | LN | HS |
| | | | |

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Appendix 2 Pluvial Flood Depths

# 12 Modelling Report

## 12.1 Introduction

12.1.1 This technical note presents the results of the hydraulic modelling carried out to verify pluvial flood depths and flow routes within the River Nar catchment.

12.1.2 The hydraulic modelling has been calculated using the direct rainfall method (DRM) 2D pluvial flood modelling in Flood Modeller Pro.

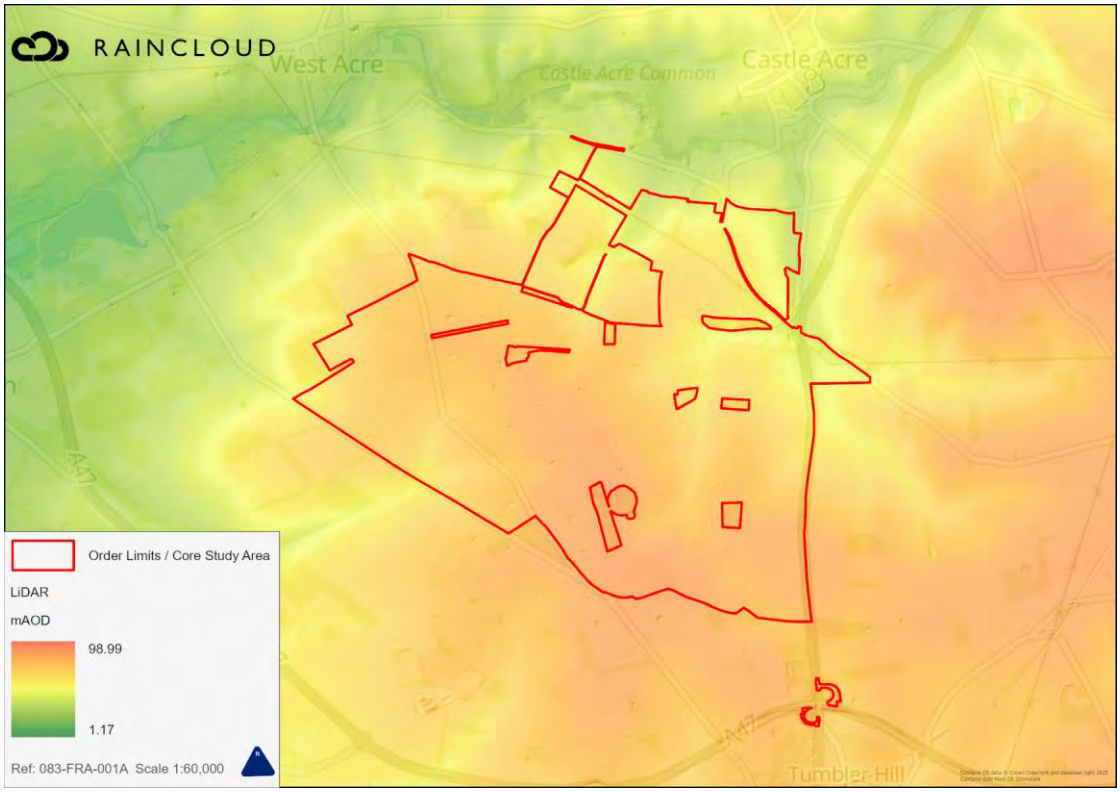
## 12.2 Study Area

### Site Inspections/Topography

12.2.1 Site walkovers were initially taken on 1st October 2024. An additional walkover was undertaken in September 2025 to verify the results of the 2D rainfall modelling as part of the **ES Appendix 12.2: Flood Risk Assessment** [**APP/6.4**].

12.2.2 1 metre (m) resolution Lidar data shows that land within the CSA is generally gently sloping, with elevations from 37 m above ordnance datum (AOD) in the south to 85 m AOD in the northeast, as shown in Figure B12-1-1.

**Plate B12-1-1: Topography within CSA**



### Watercourses

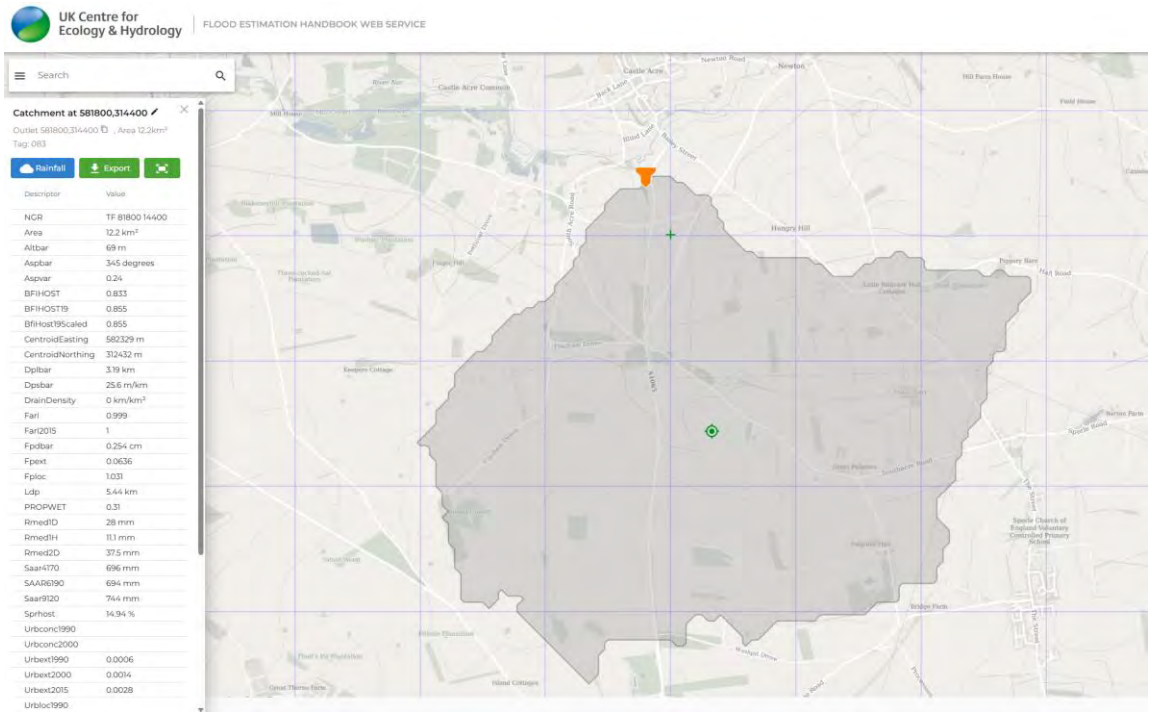
12.2.3 The Core and Wider Study Areas are located within the primary catchment of the River Nar, which is located approximately 540 m north of the CSA at its nearest point.

12.2.4 An unnamed tributary of the River Nar is located to the east of Southacre Road in the eastern section of the CSA. There is a topographical rise of 5 m from the southern bank of the unnamed watercourse to the proposed access point to the Scheme.

### Catchment

12.2.5 The River Nar catchment extent ('the Catchment'), grid reference TF818144, located southwest of South Acre, and is shown in Plate B12-1-2.

**Plate B12-1-2: Catchment Extent**




12.2.6 The Catchment is predominately agricultural, with a few minor roads included.

12.2.7 The total extent based on the Flood Estimation Handbook (FEH) is 12.2 km$^2$.

## 12.3 Methodology

### Modelling Approach

12.3.1 A direct rainfall approach using 2D hydraulic modelling software Flood Modeller Pro (version 7.3.9316.27677) has been used.

12.3.2 Rainfall profiles (hyetographs) are derived using catchment descriptors from the FEH Web Service are used alongside ReFH2 software to generate rainfall depth duration frequency (DDF) estimates. DDF catchment descriptors are shown within Appendix 1 of this Report.

12.3.3 The rainfall events of known probability are directly applied to ground surface and routed overland to provide an indication of potential surface water depths.

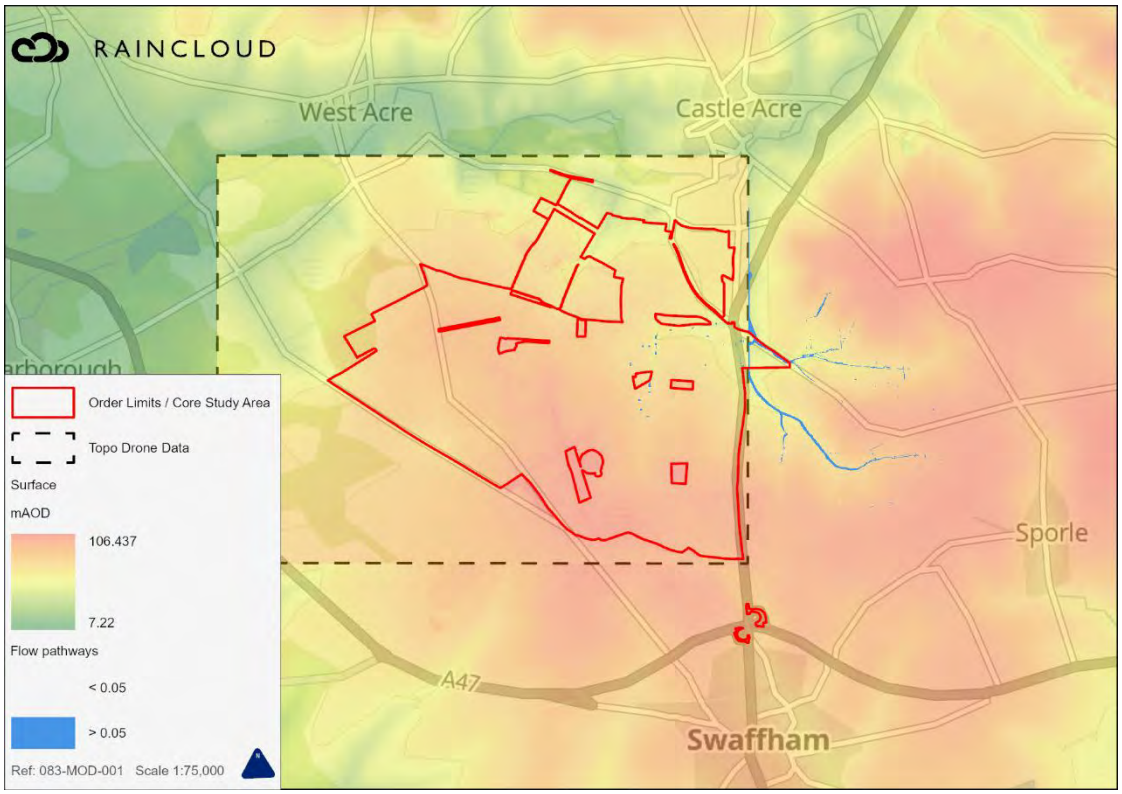
12.3.4 These depths were retrieved for a range of return periods and storm durations for both Summer and Winter storm profiles.

## Topography

12.3.5 The 2022 LiDAR DTM with a horizontal resolution of 1m was retrieved from the Environmental Agency open source web portal. A 2m grid resolution was used in the model.

12.3.6 Topographical levels have been obtained from a drone survey for Site and was merged with the LiDAR from outside of the Site boundary. Resolution of the topographical drone data does not provide a sufficiently accurate topographical base for modelling fine details including flow pathways compared to the LiDAR data and leads to an underrepresentation of pluvial flooding within the Site, as shown in Plate B12-1-3.

**Plate B12-1-3: Flow pathways with Topographical drone data and LiDAR**



12.3.7 Flow pathways obtained using LiDAR are at a higher resolution than pathways obtained using the topographical data, and therefore topographical data derived from drone survey has been discounted for flood modelling.

12.3.8 LiDAR data levels were spot checked against drone derived topographical levels in open fields. A good correlation was found between LiDAR and topographical data values. As such, LiDAR data was used as the surface layer for flood modelling.

### Mesh Modifications

12.3.9 Surface roughness values were determined by industry standard methods (Chow, 1959).

12.3.10 A default global Manning's n roughness of 0.035 was initially applied to the whole catchment, representing mature row crops[1].

12.3.11 The OS MasterMap land use data identifies roads. buildings, and woodlands. The height of these layers are adjusted above or below LiDAR elevation within the model and are shown within Table B12-1-1.

**Table B12-1-1: Land use data and LiDAR elevation**

| Land Cover | Height Adjusted (m) |
|---|---|
| Roads | - 0.01 |
| Buildings | + 2.0 |
| Woodland | + 0.1 |

### Structures

12.3.12 There are no structures, such as river culverts, embankments and flow controls that have been incorporated into the model.

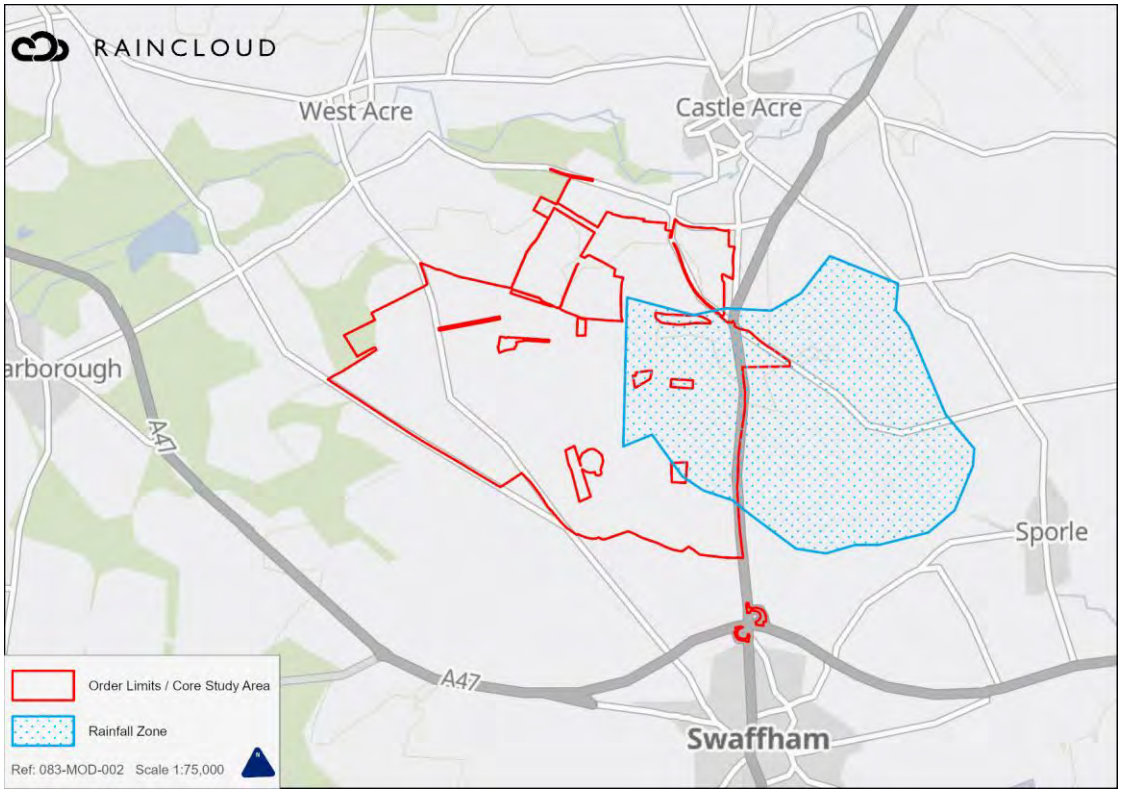
## 12.4 Rainfall Analysis

### Rainfall Zone

12.4.1 The Rainfall Zone relates to the area where rainfall is applied to the 2D domain and was chosen to reflect the EA pluvial pathways and depths which could impact the placement or function of electrically sensitive infrastructure of the Scheme. The Rainfall Zone is shown in Plate B12-1-4.

[1] Manning's n for Channels (Chow, 1959)

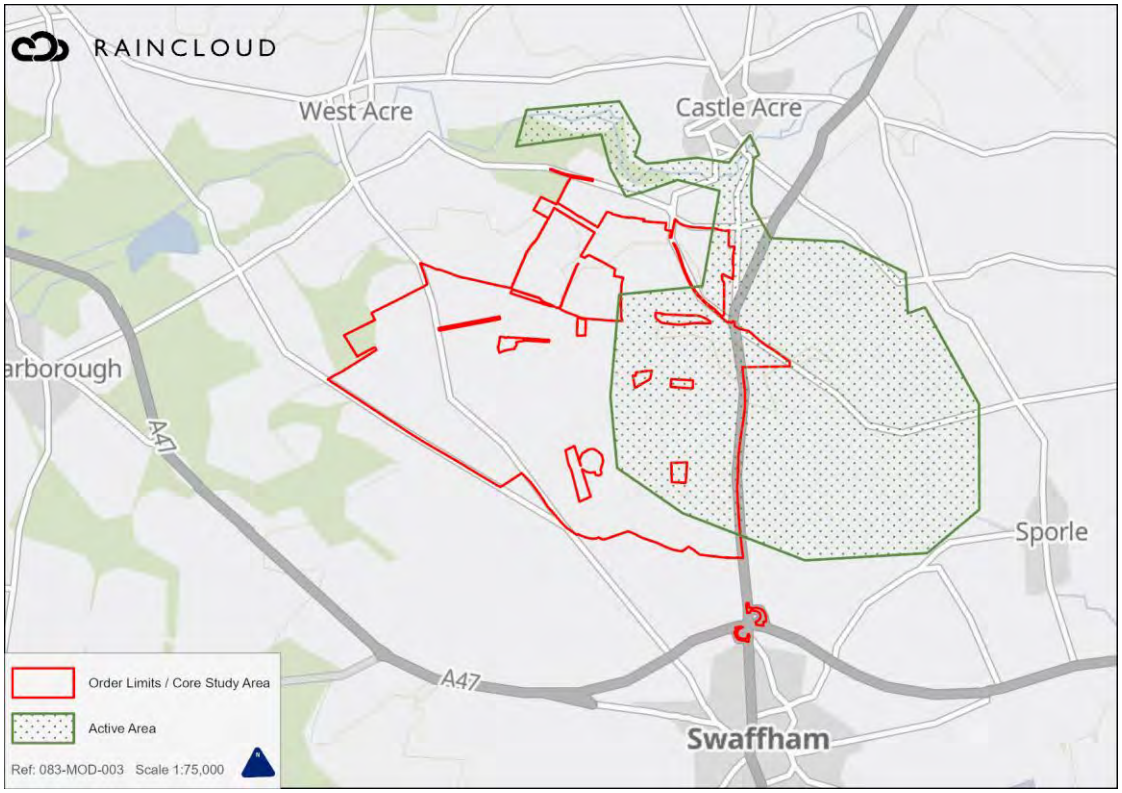
**Plate B12-1-4: Rainfall Zone**




## Active Area

12.4.2 Plate B12-1-5 shows the features of the 2D domain used to represent the pluvial flood plain and its structures. The extent of the 2D domain was adjusted during the model stages of the modelling, with the active area set to allow flood waters in the modelled events flow unimpeded through the model and not ‘glasswall’.

**Plate B12-1-5: Active Area**




## Climate Change Allowances

12.4.3 The latest climate change allowances for peak rainfall were applied to the rainfall hyetographs input. Table B12-1-2 shows the Environment Agency climate change allowances for peak rainfall intensity for North West Norfolk Management Catchment[2].

**Table B12-1-2: Climate Change Peak Rainfall Intensities - DEFRA**

| Allowance | Total Potential Anticipated Change for the 2050's | Total Potential Anticipated Change for the 2070's |
|---|---|---|
| Central | 20% | 25% |
| Upper End Allowance | 40% | 40% |

12.4.4 North West Norfolk Management Catchment peak rainfall Central Allowance of 25% for the 2070 epoch was initially +used to assess pluvial flooding.

[2] https://environment-test.data.gov.uk/hydrology/climate-change-allowances/rainfall?mgmtcatid=3065

12.4.5 However, there is the potential that some elements of the Scheme, such as the National Grid Substation which may remain operational beyond the proposed design life of 60 years, and therefore an uplift of 40% to the rainfall within the direct rainfall modelling is applied.

12.4.6 Therefore, the Central Allowance and the Upper End Allowance for the 2070's epoch have been applied to the direct rainfall hyetographs for the 1% AEP event.

### Return Periods

12.4.7 Hyetographs for the following rainfall events were generated:

- 3.33% AEP
- 1% AEP
- 1% AEP plus 25 % CC; and
- 1% AEP plus 40 % CC.

### Storm Duration

12.4.8 The model was run for a duration of 3 hours for each event to allow surface water flows to pass through the catchment following the end of the storm.

12.4.9 The critical storm duration was the summer 3-hour storm duration as it resulted in the greatest surface water depths and therefore is used for design runs.

12.4.10 The net rainfall value from ReFH2 was applied to the model, as ReFH2 net rainfall accounts for infiltration and other hydrological processes and is deemed an appropriate methodology by the EA, as per the Flood Estimation guidelines.

12.4.11 The ReFH2 net rainfall does not account for losses to the sewer network or highways drainage network and therefore provides a worst-case scenario to the Site.

## 12.5 Model Results

12.5.1 Outputs from Flood Modeller Pro are presented as mapped pluvial flood extents and depths in Appendix 2. Flood depths below 0.05 m have been filtered in accordance with Section 7.3 Depths of the EA's What is the Risk of Flooding from Surface Water map? Report (version 2.0 April 2019) document.

### Model Health

12.5.2 The model simulation log files show that peak and final mass error is less than 0.01% for all events. The log files are shown in Plate B12-1-6.

## 12.6 Model Proving

### Run performance

The time step used was set at 1 second.

The total mass error is within +/-1.0% for all model runs undertaken, as demonstrated in Plate B12-1-6.

**Plate B12-1-6: Mass error for 1% AEP and 1 % AEP + 25% climate change run**

```
Maximum Courant number:20.5
Wet cell count:
   Total number of cells wetted:    1442019
   Maximum number of wet cells :    1267774 at time       0.95hr
   Final number of wet cells   :     610682
   Final mass error            :       0.00%
Volumes:
   Maximum volume :  111742.    m3 at time       2.15hr
   Final volume   :  111212.    m3
Vertical/horizontal extents:
   Bounding rectangle : ( 580571.00, 310834.00), ( 584237.00, 315266.00)
   Wet bounding cells : 0.71% (62 out of         8728   )

Run completed in 7278.4 seconds
Spatial diagnostic output written to D:\OneDrive - raincloud-consulting.co.uk\Projects\083_TheDroves\FM\2D\\083_2D_1AEP_diagnostics.sdd
```

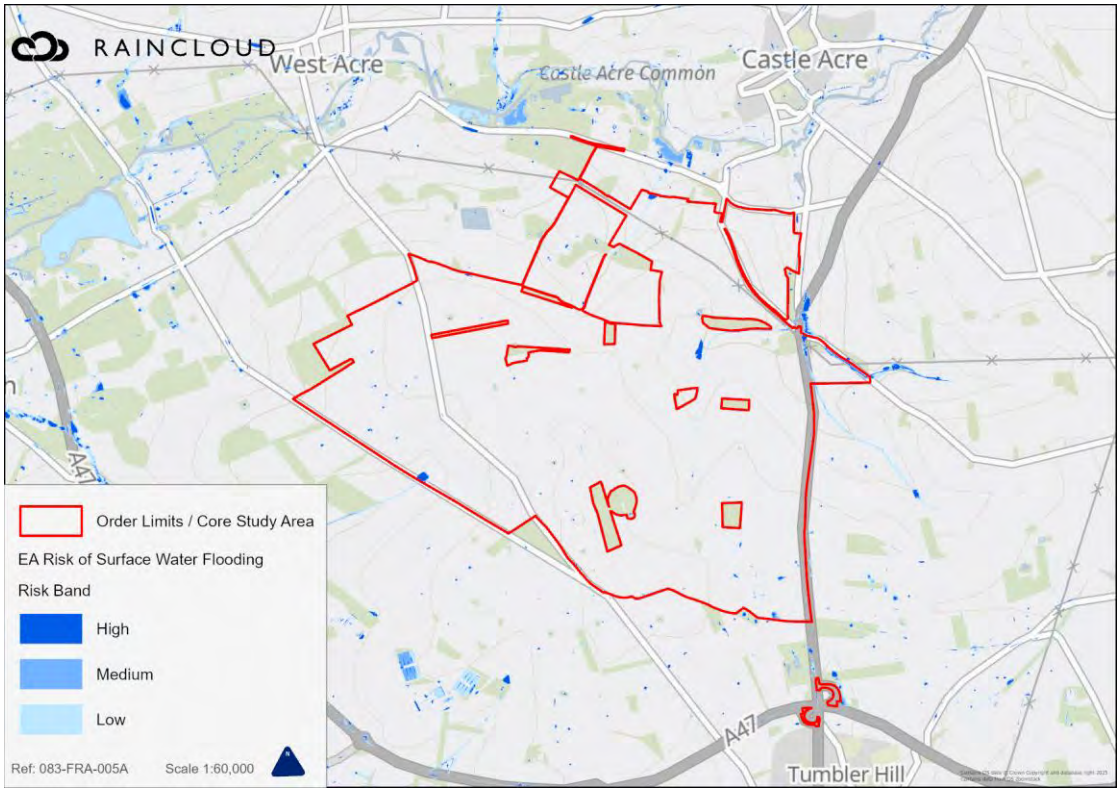
```
Maximum Courant number:18.9
Wet cell count:
   Total number of cells wetted:    1521236
   Maximum number of wet cells :    1352147 at time       0.93hr
   Final number of wet cells   :     656684
   Final mass error            :       0.01%
Volumes:
   Maximum volume :  140405.    m3 at time       2.13hr
   Final volume   :  139856.    m3
Vertical/horizontal extents:
   Bounding rectangle : ( 580211.00, 310832.00), ( 584237.00, 315292.00)
   Wet bounding cells : 0.93% (81 out of         8728   )

Run completed in 6469.8 seconds
Spatial diagnostic output written to D:\OneDrive - raincloud-consulting.co.uk\Projects\083_TheDroves\FM\2D\\083_2D_1AEP_CC_diagnostics.sdd
```

### Calibration and Validation

12.6.1 There is no river (flow or level) gauge situated within an appropriate distance of this location to provide calibration data.

12.6.2 Flood extents generated for this study are similar to those shown on the Environment Agency RoFSW for the 1% AEP event, suggesting the use of 'Net Rainfall' hyetographs and losses included within the ReFH2 model represents the catchment well. The comparison can be seen from Plate B12-1-7.

**Figure B12-1-7: EA RoSWF 2025 Flood Extents**




## Modelling Assumptions

12.6.3 The representation of any complex system by a model requires a number of assumptions to be made:

- LiDAR is representative of the land surface and no errors have been introduced through the filtering algorithms
- ReFH design rainfall inflows accurately represent rainfall for a given return period storm event
- OS MasterMap is an accurate representation of ground cover; and
- Where roughness zones have not been implemented, a Manning's n value of 0.035 is representative.

## Limitations

12.6.4 Whilst the accuracy of a hydraulic model depends largely on the accuracy of the hydrological, topographical and structural data some assumptions and uncertainty can be introduced as part of the modelling process. These could include:

- Estimates of model parameters such as roughness, structure coefficients and percentage runoffs are representative; and
- Decisions made during model proving.

12.6.5 Calibration events were not available, as such the model was calibrated against the EA RoFSW data which has its own limitations. In the absence of historical event data this was deemed the most appropriate option.

12.6.6 No 1D structures were included within the model. The purpose of the modelling is to compare the existing Site scenario to the Scheme scenario, focusing on the Sites runoff and not structures within the model domain therefore it was deemed not applicable to implement into the model setup. No structure data was available at the time of modelling. In addition, the model does not account for the sewer system.

12.6.7 Surface water flood model representing solar farm do not include the solar panels within the model as it is not possible to do so within a 2D domain. It is recognised that solar panels are not impermeable and therefore can be excluded from the model and the solar panel underlying conditions should be represented to provide the most accurate modelling.

## 12.7 Conclusions

12.7.1 The pluvial flood modelling undertaken demonstrates that the use of high-resolution LiDAR data provides more credible results compared to lower resolution topographical drone data.

12.7.2 The model was applied to a range of design storm events, with hyetographs generated for the 3.33% AEP, 1% AEP, and 1% AEP plus climate change events.

12.7.3 The resulting flood extents for the 1% AEP event show good agreement with the EA's RoFSW mapping, providing confidence in the model outputs.

## Appendix 1: FEH Catchment Descriptors

# UK Design Flood Estimation

Generated on Wednesday, July 30, 2025 2:48:32 PM by CharlieHadden
Printed from the ReFH2 Flood Modelling software package, version 4.1.8879.22310

## Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

**Site details** Checksum: 1527-2A6A

Site name: FEH_Catchment_Descriptors_581800_314400_v5_0_1

Easting: 581800

Northing: 314400

Country: England, Wales or Northern Ireland

Catchment Area (km²): 12.2

Using plot scale calculations: Yes

Model: 2.3

Site description: None

# Model run: 100 year 1.25 CC

## Summary of results

| | | | |
|---|---|---|---|
| Rainfall - FEH22 (mm): | 75.96 | Total runoff (ML): | 49.10 |
| Total Rainfall (mm): | 70.00 | Total flow (ML): | 129.56 |
| Peak Rainfall (mm): | 47.41 | Peak flow (m³/s): | 1.80 |

## Parameters

*Where the user has overriden a system-generated value, this original value is shown in square brackets after the value used.*
** Indicates that the user locked the duration/timestep*

### Rainfall parameters (Rainfall - FEH22)

| Name | Value | User-defined? |
|---|---|---|
| Duration (hh:mm:ss) | 03:00:00 [09:00:00] | Yes |
| Timestep (hh:mm:ss) | 01:00:00 | No |
| SCF (Seasonal correction factor) | 0.98 | No |
| ARF (Areal reduction factor) | 0.94 | No |
| Seasonality | Summer [Winter] | Yes |
| Climate change factor | 1.25 | Yes |

### Loss model parameters

| Name | Value | User-defined? |
|---|---|---|
| Cini (mm) | 24.61 | No |
| Cmax (mm) | 1047.37 | No |
| Use alpha correction factor | No | No |
| Alpha correction factor | n/a | No |

### Routing model parameters

| Name | Value | User-defined? |
|---|---|---|
| Tp (hr) | 5.21 | No |
| Up | 0.65 | No |
| Uk | 0.8 | No |

**Baseflow model parameters**

| Name | Value | User-defined? |
|---|---|---|
| BF0 ($m^3/s$) | 0.01 | No |
| BL (hr) | 73.12 | No |
| BR | 3.34 | No |

**Urbanisation parameters**

| Name | Value | User-defined? |
|---|---|---|
| Sewer capacity ($m^3/s$) | 0 | No |
| Exporting drained area ($km^2$) | 0 | No |
| Urban area ($km^2$) | 0.03 | No |
| Effective URBEXT2000 | 0 | n/a |
| Impervious runoff factor | 0.7 | No |
| Imperviousness factor | 0.4 | No |
| Tp scaling factor | 0.75 | No |
| Depression storage depth (mm) | 0.5 | No |

**Time series data**

| Time (hh:mm:ss) | Rain (mm) | Sewer Loss ($m^3/s$) | Net Rain (mm) | Runoff ($m^3/s$) | Baseflow ($m^3/s$) | Total Flow ($m^3/s$) |
|---|---|---|---|---|---|---|
| 00:00:00 | 11.2952 | 0.0000 | 0.3330 | 0.0000 | 0.014 | 0.014 |
| 01:00:00 | 47.4141 | 0.0000 | 2.7261 | 0.0138 | 0.0142 | 0.0279 |
| 02:00:00 | 11.2952 | 0.0000 | 0.9658 | 0.1530 | 0.0177 | 0.171 |
| 03:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.4434 | 0.0306 | 0.474 |
| 04:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.7733 | 0.0572 | 0.831 |
| 05:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.1022 | 0.0981 | 1.2 |
| 06:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.4128 | 0.153 | 1.57 |
| 07:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.5827 | 0.218 | 1.8 |
| 08:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.4818 | 0.283 | 1.77 |
| 09:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.2917 | 0.342 | 1.63 |
| 10:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.1000 | 0.391 | 1.49 |
| 11:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.9106 | 0.431 | 1.34 |
| 12:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.7398 | 0.462 | 1.2 |
| 13:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.6269 | 0.487 | 1.11 |
| 14:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.5389 | 0.506 | 1.05 |
| 15:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.4533 | 0.522 | 0.975 |
| 16:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.3684 | 0.533 | 0.902 |
| 17:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.2844 | 0.541 | 0.825 |
| 18:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.2005 | 0.545 | 0.745 |
| 19:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.1168 | 0.544 | 0.661 |
| 20:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0400 | 0.54 | 0.581 |
| 21:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0054 | 0.534 | 0.54 |
| 22:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.527 | 0.527 |
| 23:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.52 | 0.52 |
| 24:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.513 | 0.513 |
| 25:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.506 | 0.506 |
| 26:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.499 | 0.499 |
| 27:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.492 | 0.492 |
| 28:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.486 | 0.486 |
| 29:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.479 | 0.479 |
| 30:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.472 | 0.472 |
| 31:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.466 | 0.466 |
| 32:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.46 | 0.46 |
| 33:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.453 | 0.453 |

| Time (hh:mm:ss) | Rain (mm) | Sewer Loss ($m^3/s$) | Net Rain (mm) | Runoff ($m^3/s$) | Baseflow ($m^3/s$) | Total Flow ($m^3/s$) |
|---|---|---|---|---|---|---|
| 34:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.447 | 0.447 |
| 35:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.441 | 0.441 |
| 36:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.435 | 0.435 |
| 37:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.429 | 0.429 |
| 38:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.423 | 0.423 |
| 39:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.418 | 0.418 |
| 40:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.412 | 0.412 |
| 41:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.406 | 0.406 |
| 42:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.401 | 0.401 |
| 43:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.395 | 0.395 |
| 44:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.39 | 0.39 |
| 45:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.385 | 0.385 |
| 46:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.38 | 0.38 |
| 47:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.374 | 0.374 |
| 48:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.369 | 0.369 |
| 49:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.364 | 0.364 |
| 50:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.359 | 0.359 |
| 51:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.354 | 0.354 |
| 52:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.35 | 0.35 |
| 53:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.345 | 0.345 |
| 54:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.34 | 0.34 |
| 55:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.336 | 0.336 |
| 56:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.331 | 0.331 |
| 57:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.327 | 0.327 |

## Appendix

### Catchment descriptors

| Name | Value | User-defined value used? |
|---|---|---|
| Area (km²) | 12.2 | No |
| ALTBAR | 69 | No |
| ASPBAR | 345 | No |
| ASPVAR | 0.24 | No |
| BFIHOST | 0.83 | No |
| BFIHOST19 | 0.86 | No |
| DPLBAR (km) | 3.19 | No |
| DPSBAR (mkm-¹) | 25.6 | No |
| FARL | 1 | No |
| LDP | 5.44 | No |
| PROPWET | 0.31 | No |
| RMED1H | 11.1 | No |
| RMED1D | 28 | No |
| RMED2D | 37.5 | No |
| SAAR (mm) | 694 | No |
| SAAR4170 (mm) | 696 | No |
| SPRHOST | 14.94 | No |
| URBEXT2000 | 0 | No |
| URBEXT1990 | 0 | No |
| URBCONC | 0 | No |
| URBLOC | 0 | No |
| DDF parameter C | -0.02 | No |
| DDF parameter D1 | 0.28 | No |
| DDF parameter D2 | 0.34 | No |
| DDF parameter D3 | 0.29 | No |
| DDF parameter E | 0.31 | No |
| DDF parameter F | 2.47 | No |
| DDF parameter C (1km grid value) | -0.02 | No |
| DDF parameter D1 (1km grid value) | 0.28 | No |
| DDF parameter D2 (1km grid value) | 0.32 | No |
| DDF parameter D3 (1km grid value) | 0.31 | No |
| DDF parameter E (1km grid value) | 0.31 | No |
| DDF parameter F (1km grid value) | 2.47 | No |

# UK Design Flood Estimation

Generated on Wednesday, July 30, 2025 2:47:43 PM by CharlieHadden
Printed from the ReFH2 Flood Modelling software package, version 4.1.8879.22310

## Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

**Site details** Checksum: 1527-2A6A

Site name: FEH_Catchment_Descriptors_581800_314400_v5_0_1

Easting: 581800

Northing: 314400

Country: England, Wales or Northern Ireland

Catchment Area (km²): 12.2

Using plot scale calculations: Yes

Model: 2.3

Site description: None

# Model run: 100 year 1.4 CC

## Summary of results

| | | | |
|---|---|---|---|
| Rainfall - FEH22 (mm): | 85.07 | Total runoff (ML): | 58.83 |
| Total Rainfall (mm): | 78.41 | Total flow (ML): | 154.88 |
| Peak Rainfall (mm): | 53.10 | Peak flow (m³/s): | 2.15 |

## Parameters

*Where the user has overriden a system-generated value, this original value is shown in square brackets after the value used.*
** Indicates that the user locked the duration/timestep*

### Rainfall parameters (Rainfall - FEH22)

| Name | Value | User-defined? |
|---|---|---|
| Duration (hh:mm:ss) | 03:00:00 [09:00:00] | Yes |
| Timestep (hh:mm:ss) | 01:00:00 | No |
| SCF (Seasonal correction factor) | 0.98 | No |
| ARF (Areal reduction factor) | 0.94 | No |
| Seasonality | Summer [Winter] | Yes |
| Climate change factor | 1.40 | Yes |

### Loss model parameters

| Name | Value | User-defined? |
|---|---|---|
| Cini (mm) | 24.61 | No |
| Cmax (mm) | 1047.37 | No |
| Use alpha correction factor | No | No |
| Alpha correction factor | n/a | No |

### Routing model parameters

| Name | Value | User-defined? |
|---|---|---|
| Tp (hr) | 5.21 | No |
| Up | 0.65 | No |
| Uk | 0.8 | No |

**Baseflow model parameters**

| Name | Value | User-defined? |
|---|---|---|
| BF0 ($m^3/s$) | 0.01 | No |
| BL (hr) | 73.12 | No |
| BR | 3.34 | No |

**Urbanisation parameters**

| Name | Value | User-defined? |
|---|---|---|
| Sewer capacity ($m^3/s$) | 0 | No |
| Exporting drained area ($km^2$) | 0 | No |
| Urban area ($km^2$) | 0.03 | No |
| Effective URBEXT2000 | 0 | n/a |
| Impervious runoff factor | 0.7 | No |
| Imperviousness factor | 0.4 | No |
| Tp scaling factor | 0.75 | No |
| Depression storage depth (mm) | 0.5 | No |

**Time series data**

| Time (hh:mm:ss) | Rain (mm) | Sewer Loss ($m^3/s$) | Net Rain (mm) | Runoff ($m^3/s$) | Baseflow ($m^3/s$) | Total Flow ($m^3/s$) |
|---|---|---|---|---|---|---|
| 00:00:00 | 12.6507 | 0.0000 | 0.3812 | 0.0000 | 0.014 | 0.014 |
| 01:00:00 | 53.1038 | 0.0000 | 3.2660 | 0.0157 | 0.0142 | 0.0299 |
| 02:00:00 | 12.6507 | 0.0000 | 1.1749 | 0.1810 | 0.0184 | 0.199 |
| 03:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.5280 | 0.0339 | 0.562 |
| 04:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.9231 | 0.0656 | 0.989 |
| 05:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.3170 | 0.115 | 1.43 |
| 06:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.6900 | 0.18 | 1.87 |
| 07:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.8961 | 0.258 | 2.15 |
| 08:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.7770 | 0.337 | 2.11 |
| 09:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.5494 | 0.407 | 1.96 |
| 10:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.3198 | 0.466 | 1.79 |
| 11:00:00 | 0.0000 | 0.0000 | 0.0000 | 1.0928 | 0.514 | 1.61 |
| 12:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.8877 | 0.551 | 1.44 |
| 13:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.7520 | 0.581 | 1.33 |
| 14:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.6467 | 0.604 | 1.25 |
| 15:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.5442 | 0.623 | 1.17 |
| 16:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.4425 | 0.637 | 1.08 |
| 17:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.3417 | 0.646 | 0.988 |
| 18:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.2411 | 0.651 | 0.892 |
| 19:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.1408 | 0.65 | 0.791 |
| 20:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0485 | 0.646 | 0.694 |
| 21:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0066 | 0.638 | 0.645 |
| 22:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.63 | 0.63 |
| 23:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.621 | 0.621 |
| 24:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.613 | 0.613 |
| 25:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.605 | 0.605 |
| 26:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.596 | 0.596 |
| 27:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.588 | 0.588 |
| 28:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.58 | 0.58 |
| 29:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.572 | 0.572 |
| 30:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.565 | 0.565 |
| 31:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.557 | 0.557 |
| 32:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.549 | 0.549 |
| 33:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.542 | 0.542 |

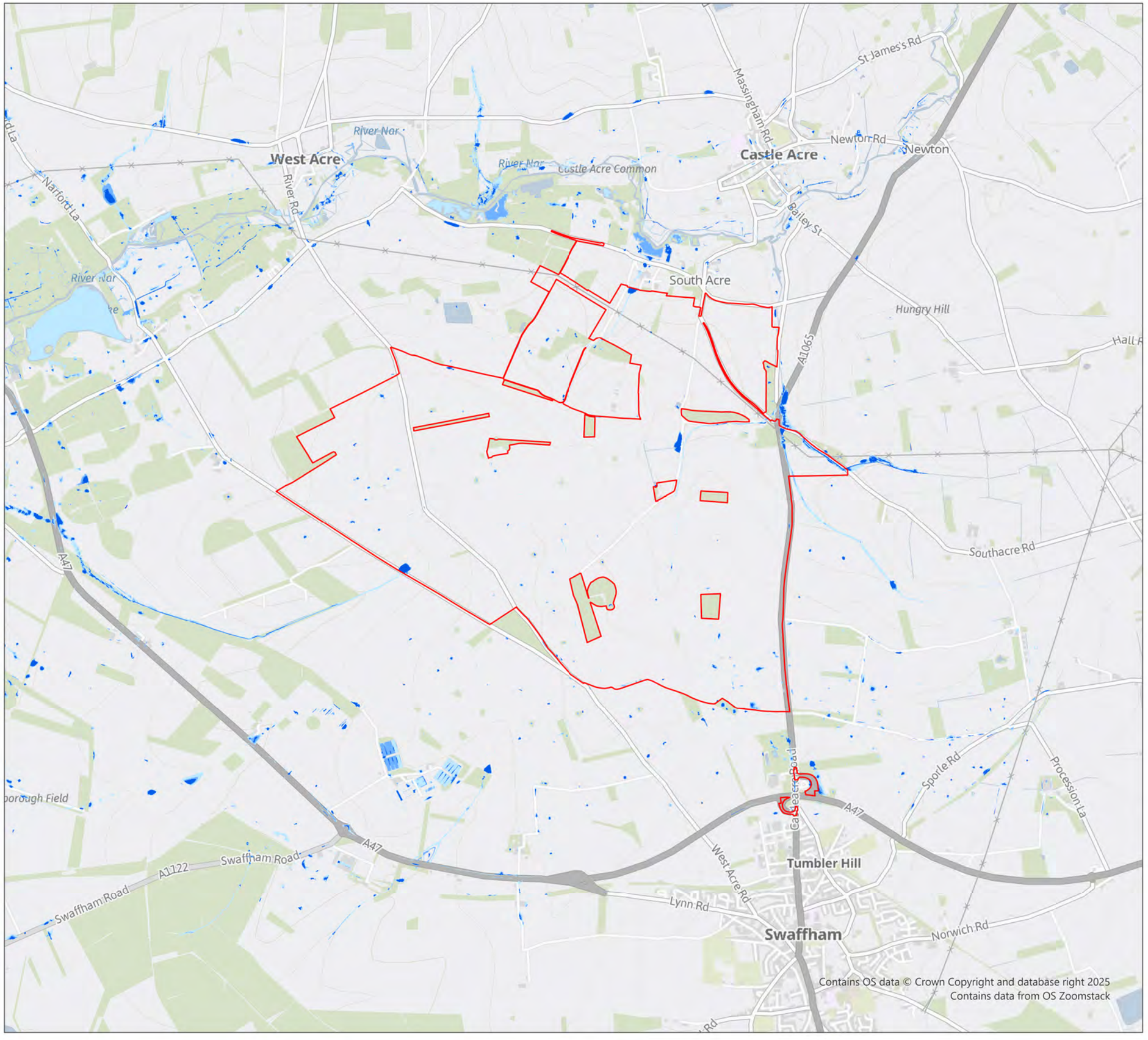
| Time (hh:mm:ss) | Rain (mm) | Sewer Loss ($m^3/s$) | Net Rain (mm) | Runoff ($m^3/s$) | Baseflow ($m^3/s$) | Total Flow ($m^3/s$) |
|---|---|---|---|---|---|---|
| 34:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.535 | 0.535 |
| 35:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.527 | 0.527 |
| 36:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.52 | 0.52 |
| 37:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.513 | 0.513 |
| 38:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.506 | 0.506 |
| 39:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.499 | 0.499 |
| 40:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.492 | 0.492 |
| 41:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.486 | 0.486 |
| 42:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.479 | 0.479 |
| 43:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.473 | 0.473 |
| 44:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.466 | 0.466 |
| 45:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.46 | 0.46 |
| 46:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.454 | 0.454 |
| 47:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.447 | 0.447 |
| 48:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.441 | 0.441 |
| 49:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.435 | 0.435 |
| 50:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.429 | 0.429 |
| 51:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.424 | 0.424 |
| 52:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.418 | 0.418 |
| 53:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.412 | 0.412 |
| 54:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.407 | 0.407 |
| 55:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.401 | 0.401 |
| 56:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.396 | 0.396 |
| 57:00:00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.39 | 0.39 |

## Appendix

### Catchment descriptors

| Name | Value | User-defined value used? |
|---|---|---|
| Area (km²) | 12.2 | No |
| ALTBAR | 69 | No |
| ASPBAR | 345 | No |
| ASPVAR | 0.24 | No |
| BFIHOST | 0.83 | No |
| BFIHOST19 | 0.86 | No |
| DPLBAR (km) | 3.19 | No |
| DPSBAR (mkm-¹) | 25.6 | No |
| FARL | 1 | No |
| LDP | 5.44 | No |
| PROPWET | 0.31 | No |
| RMED1H | 11.1 | No |
| RMED1D | 28 | No |
| RMED2D | 37.5 | No |
| SAAR (mm) | 694 | No |
| SAAR4170 (mm) | 696 | No |
| SPRHOST | 14.94 | No |
| URBEXT2000 | 0 | No |
| URBEXT1990 | 0 | No |
| URBCONC | 0 | No |
| URBLOC | 0 | No |
| DDF parameter C | -0.02 | No |
| DDF parameter D1 | 0.28 | No |
| DDF parameter D2 | 0.34 | No |
| DDF parameter D3 | 0.29 | No |
| DDF parameter E | 0.31 | No |
| DDF parameter F | 2.47 | No |
| DDF parameter C (1km grid value) | -0.02 | No |
| DDF parameter D1 (1km grid value) | 0.28 | No |
| DDF parameter D2 (1km grid value) | 0.32 | No |
| DDF parameter D3 (1km grid value) | 0.31 | No |
| DDF parameter E (1km grid value) | 0.31 | No |
| DDF parameter F (1km grid value) | 2.47 | No |

## Appendix 2: Pluvial Flood Depths




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

EA Risk of Surface Water Flooding

Risk Band

- High
- Medium
- Low

1:30,000 Scale @ A3

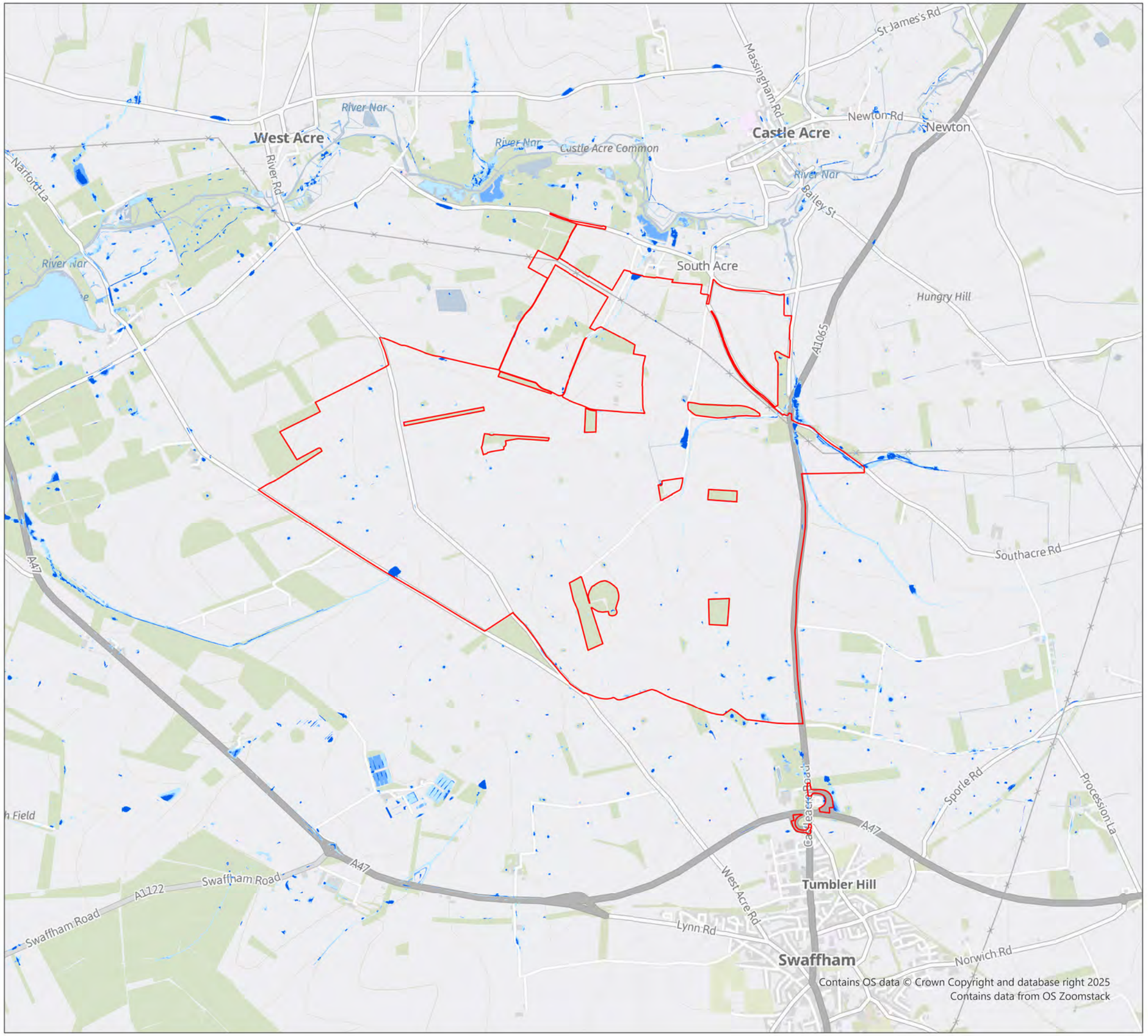
0 0.5 1 km

N

| Ref: 083-FRA-005B | Date: 17/11/2025 |
|---|---|

**1 % AEP Pluvial Flood Extents (EA - RoFSW 2025)**
Figure A12-2-1

**The Droves Solar Farm Modelling Report**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

EA Risk of Surface Water Flooding

Risk Band

- High
- Medium
- Low

1:28,286 Scale @ A3

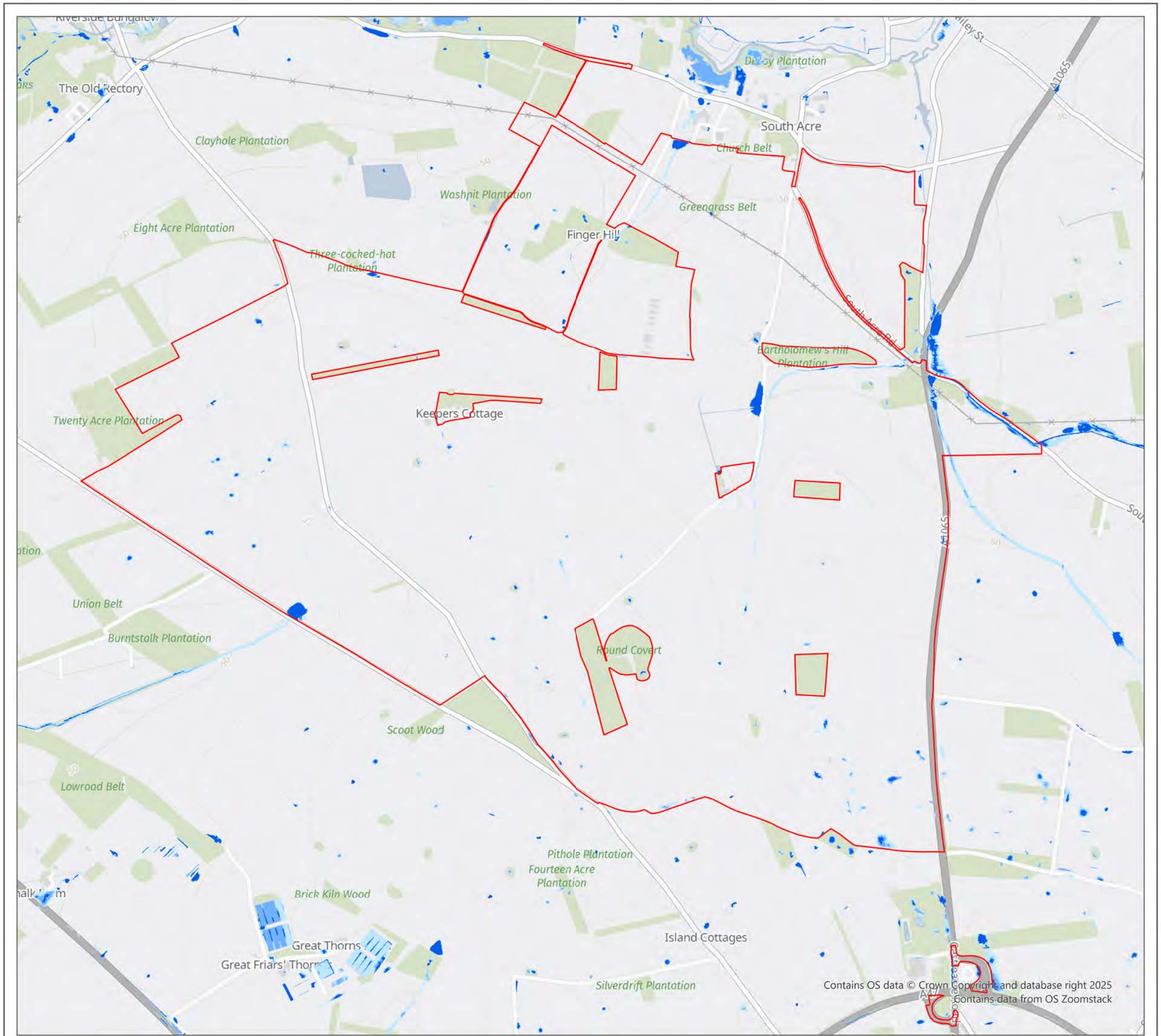
0 0.5 1 km

N

| Ref: 083-FRA-005B | Date: 17/11/2025 |
|---|---|

**1 % AEP Pluvial Flood Extents (EA - RoFSW 2025)**
Figure A12-2-1

**The Droves Solar Farm Modelling Report**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

EA Risk of Surface Water Flooding

Risk Band

- High
- Medium
- Low

1:17,679 Scale @ A3

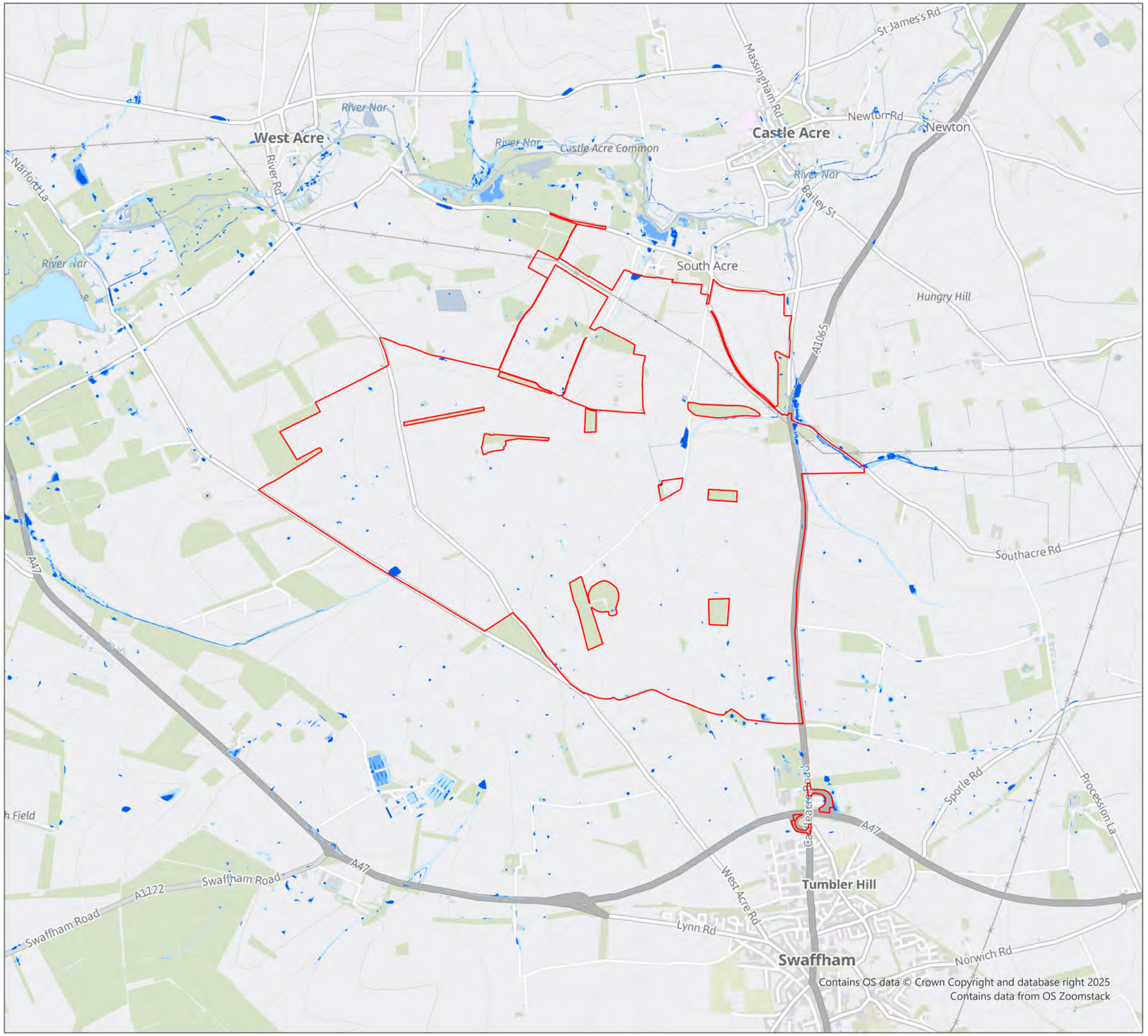
0 0.3 0.6 km

N

| Ref: 083-FRA-005B | Date: 17/11/2025 |
|---|---|

**1 % AEP Pluvial Flood Extents (EA - RoFSW 2025)**
Figure A12-2-1

**The Droves Solar Farm Modelling Report**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

EA Risk of Surface Water Flooding

Risk Band

- High
- Medium
- Low

1:28,286 Scale @ A3

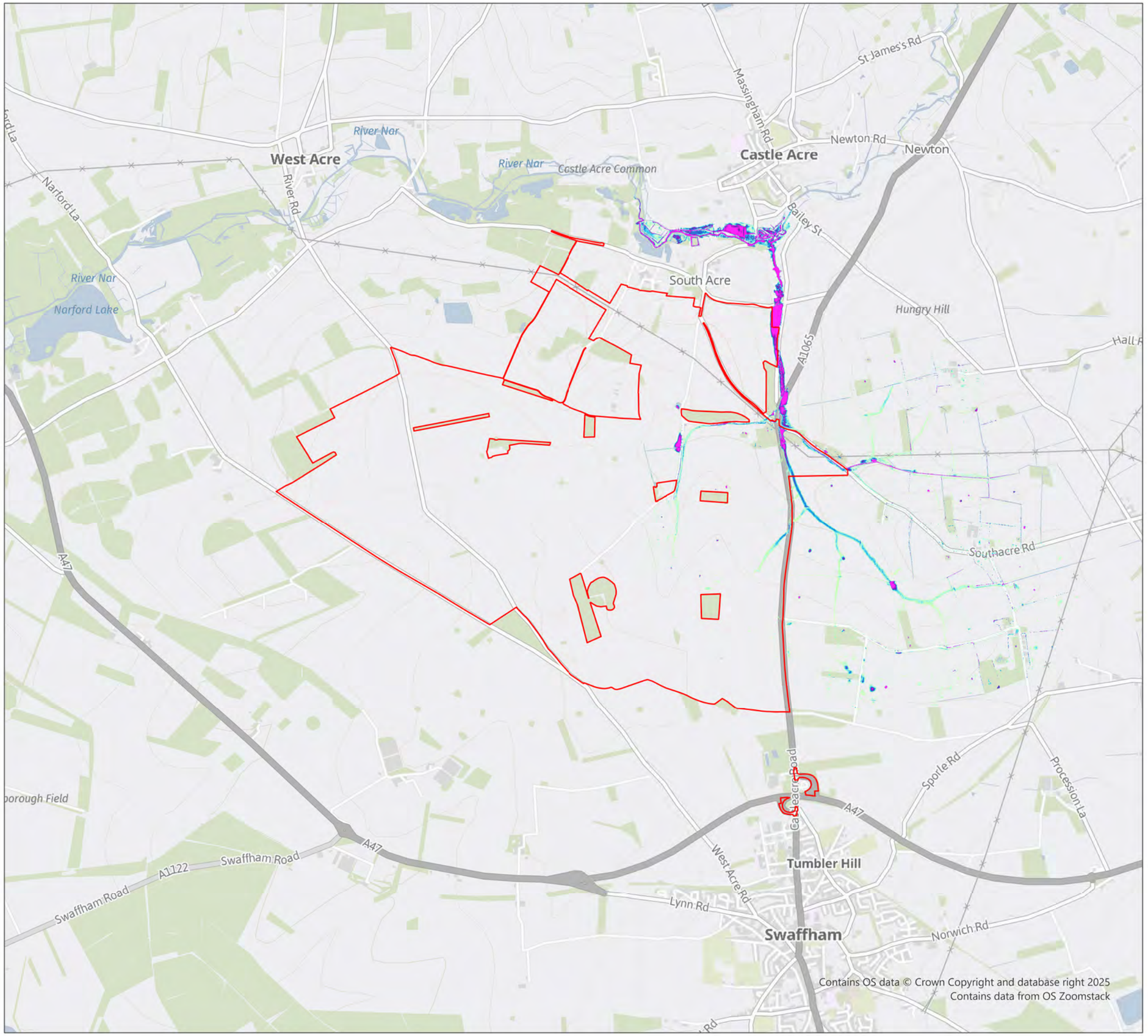
0 0.5 1 km

N

| Ref: 083-FRA-005B | Date: 17/11/2025 |
|---|---|

**1 % AEP Pluvial Flood Extents (EA - RoFSW 2025)**
Figure A12-2-1

**The Droves Solar Farm Modelling Report**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

1 % AEP - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:30,000 Scale @ A3

0 0.5 1 km

N

| Ref: 083-FRA-006B | Date: 17/11/2025 |
|---|---|

**1 % AEP Flood Depths - Raincloud 2D Modelling**
Figure A12-2-2

**The Droves Solar Farm Modelling Report**

THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

1 % AEP - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:28,286 Scale @ A3

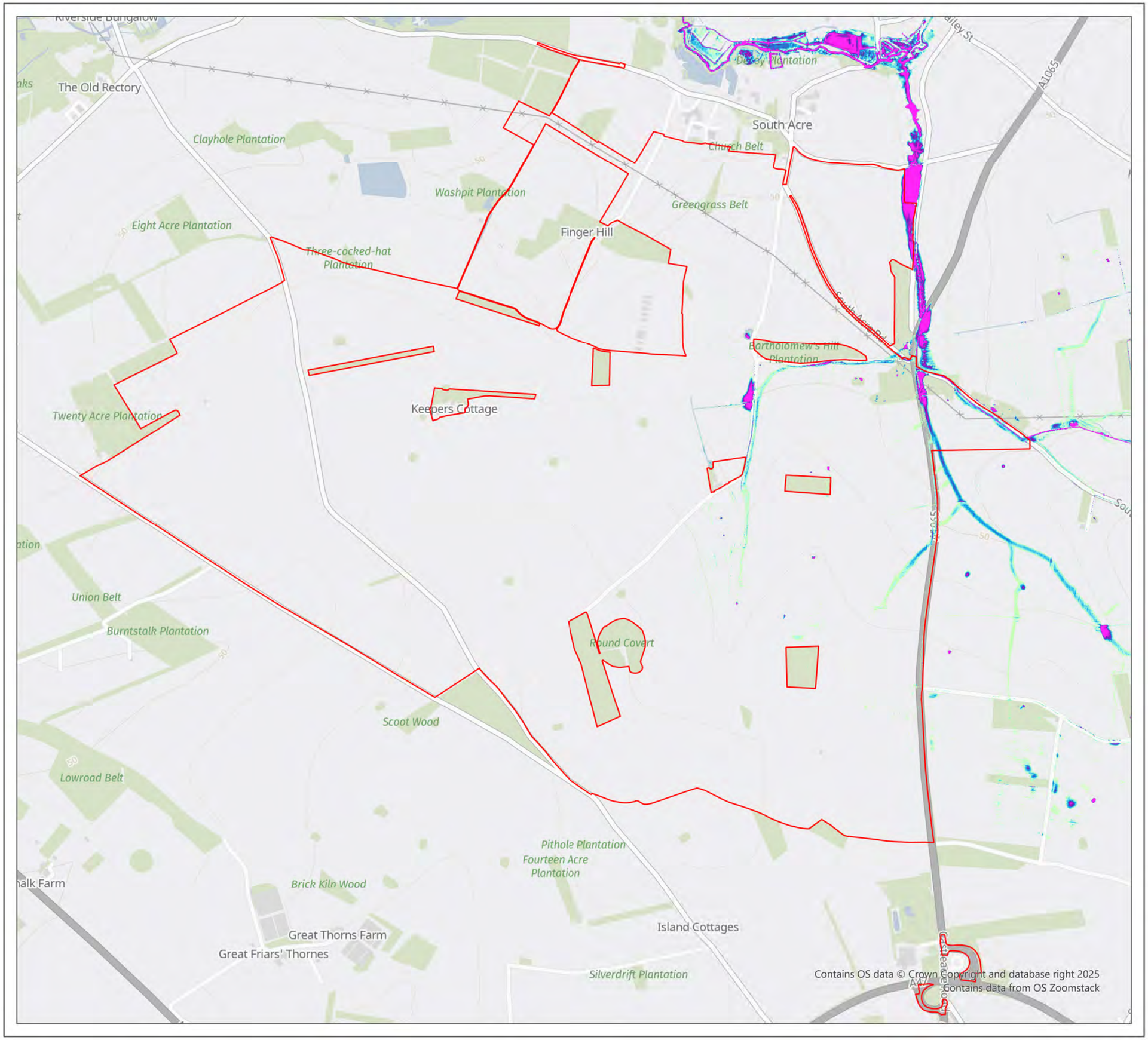
0 0.5 1 km

N

| Ref: 083-FRA-006B | Date: 17/11/2025 |
|---|---|

**1 % AEP Flood Depths - Raincloud 2D Modelling**
Figure A12-2-2

**The Droves Solar Farm Modelling Report**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

1 % AEP - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:17,679 Scale @ A3

0 0.3 0.6 km

N

| Ref: 083-FRA-006B | Date: 17/11/2025 |
|---|---|

**1 % AEP Flood Depths - Raincloud 2D Modelling**
Figure A12-2-2

**The Droves Solar Farm Modelling Report**

THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

1 % AEP - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:28,286 Scale @ A3

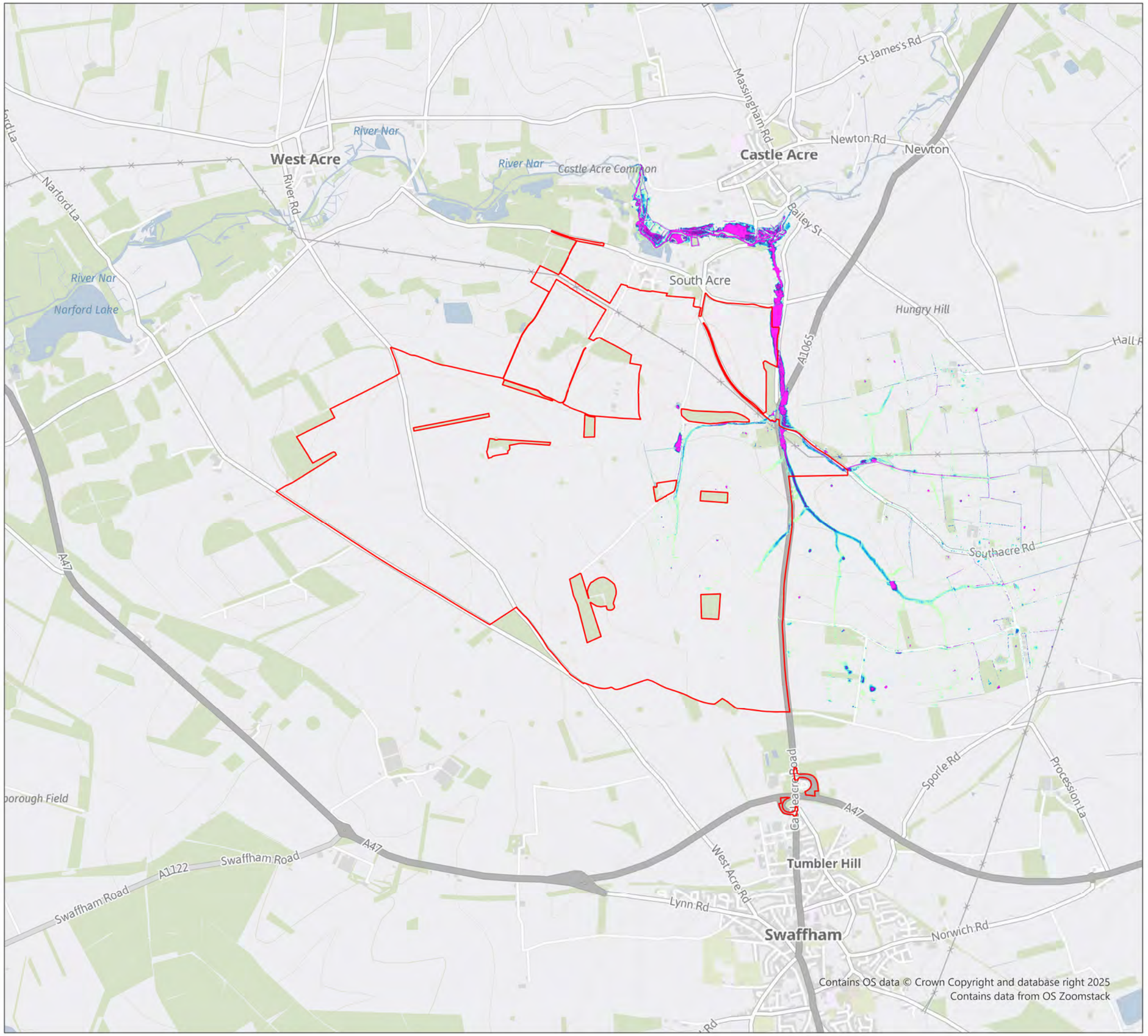
0 0.5 1 km

N

| Ref: 083-FRA-006B | Date: 17/11/2025 |
|---|---|

**1 % AEP Flood Depths - Raincloud 2D Modelling**
Figure A12-2-2

**The Droves Solar Farm Modelling Report**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

1 % AEP + 25 % CC - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.1
- 0.101 - 0.15
- 0.151 - 0.2
- 0.201 - 0.25
- 0.251 - 0.3
- 0.301 - 0.35
- 0.351 - 0.4
- 0.401 - 0.45
- > 0.45

1:30,000 Scale @ A3

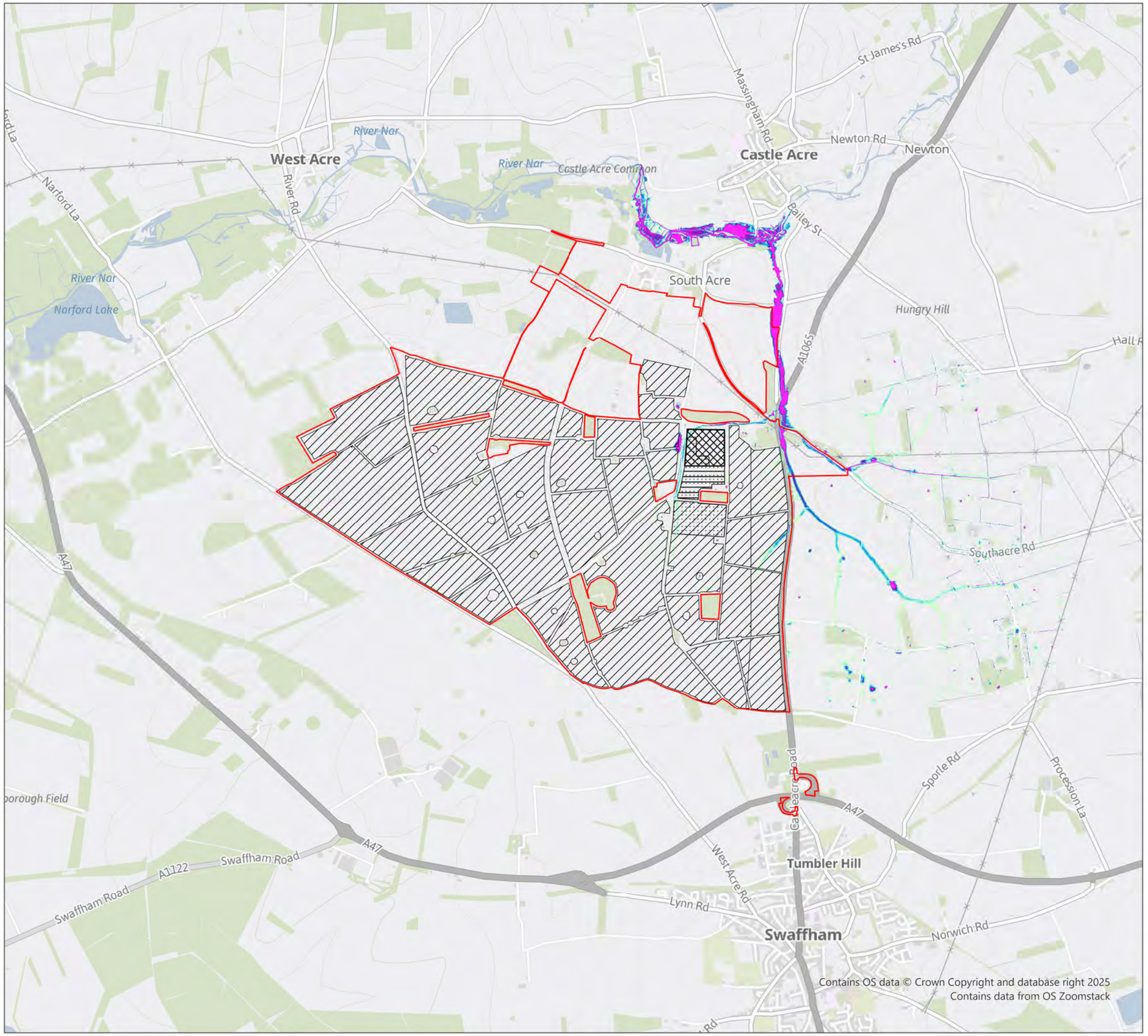
0 0.5 1 km

N

| Ref: 083-FRA-007B | Date: 17/11/2025 |
|---|---|

**1 % AEP + 25 % CC Flood Depths - Raincloud 2D Modelling**
Figure A12-2-3

**The Droves Solar Farm Modelling Report**




THE DROVES
SOLAR FARM
RAINCLOUD

- Order Limits / Core Study Area
- Work No. 1: Solar PV
- Work No. 2: BESS Work Area
- Work No. 3: Customer Substation
- Work No. 4: National Grid Substation

1 % AEP + 25 % CC - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.1
- 0.101 - 0.15
- 0.151 - 0.2
- 0.201 - 0.25
- 0.251 - 0.3
- 0.301 - 0.35
- 0.351 - 0.4
- 0.401 - 0.45
- > 0.45

1:30,000 Scale @ A3

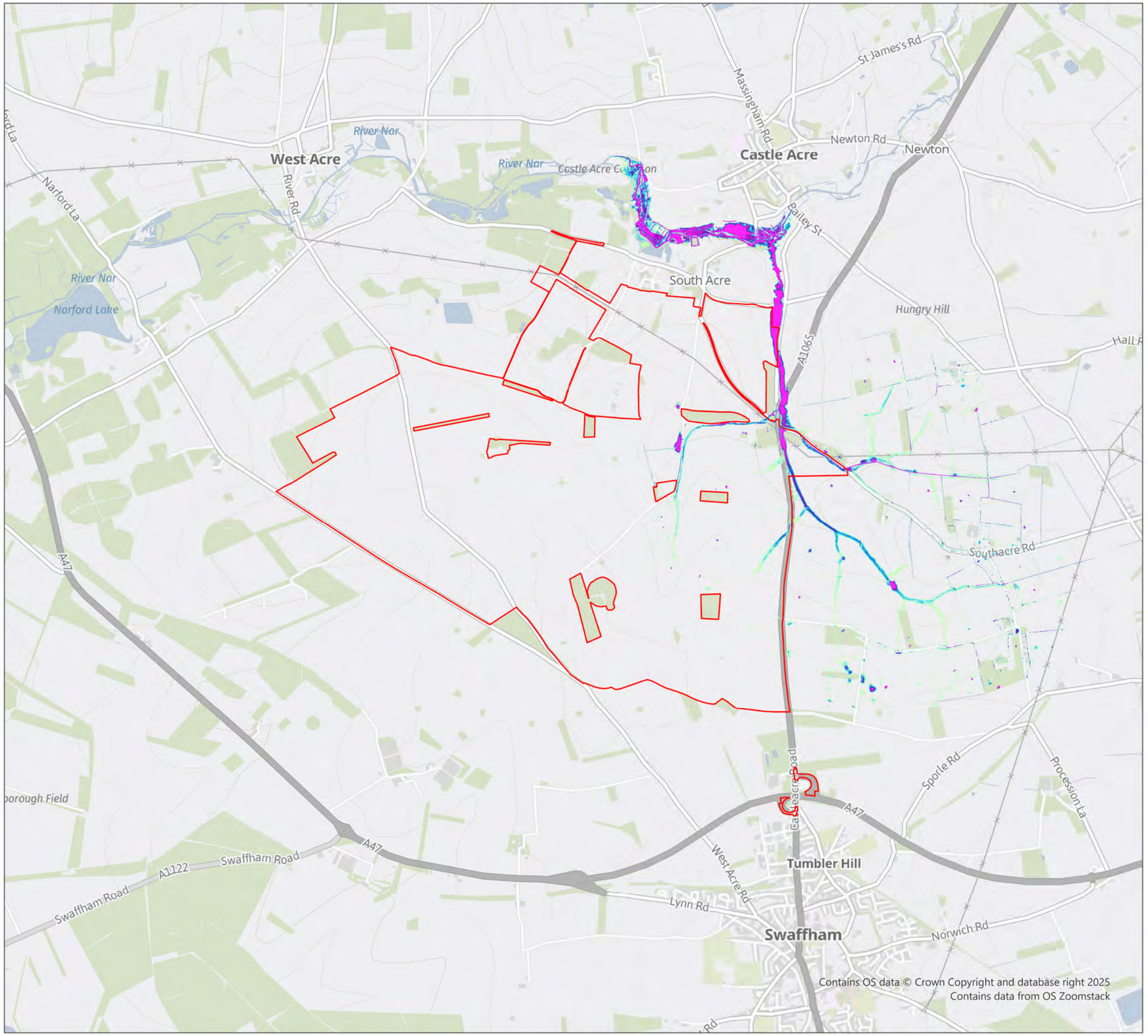
0 0.5 1 km

N

| Ref: 083-FRA-008B | Date: 17/11/2025 |
|---|---|

**Modelled 1 % AEP + 25 % CC Pluvial Flood Depth**
Figure A12-2-4

**The Droves Solar Farm Modelling Report**




THE DROVES
SOLAR FARM
RAINCLOUD

Order Limits / Core Study Area

1 % AEP + 40 % CC - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:30,000 Scale @ A3

0 0.5 1 km

N

| Ref: 083-FRA-009B | Date: 17/11/2025 |
|---|---|

**1 % AEP + 40 % CC Flood Depths - Raincloud 2D Modelling**
Figure A12-2-4

**The Droves Solar Farm Modelling Report**

THE DROVES
SOLAR FARM
RAINCLOUD

- Work No. 1: Solar PV
- Work No. 2: BESS
- Work No. 3: Customer Substation
- Work No. 4: National Grid Substation

1 % AEP + 40 % CC - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:30,000 Scale @ A3

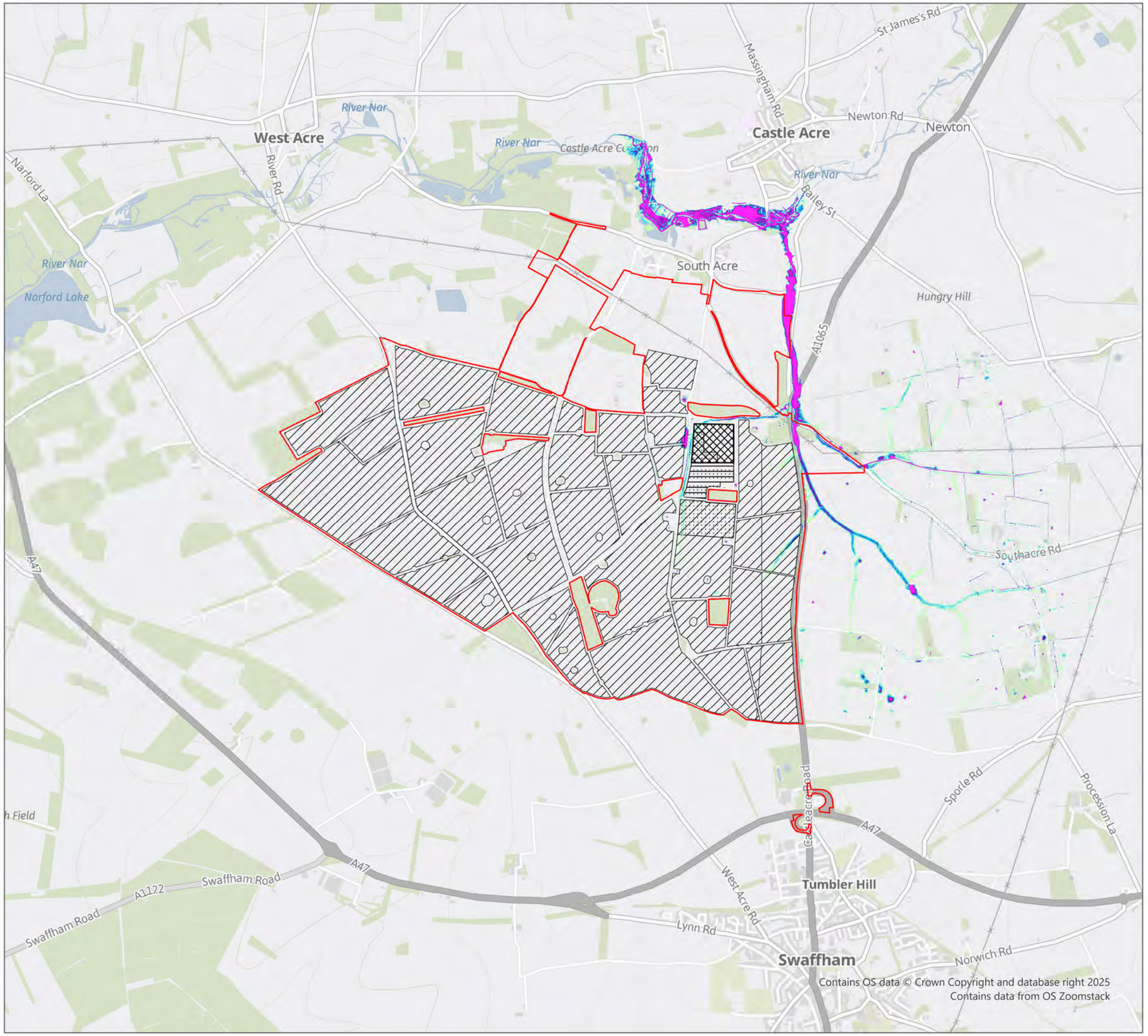
0 0.5 1 km

N

| Ref: 083-FRA-012B | Date: 17/11/2025 |
|---|---|

**Modelled 1 % AEP + 40 % CC Pluvial Flood Depth**
Figure A12-2-6

**The Droves Solar Farm Modelling Report**




THE DROVES
SOLAR FARM
RAINCLOUD

- Work No. 1: Solar PV
- Work No. 2: BESS
- Work No. 3: Customer Substation
- Work No. 4: National Grid Substation

1 % AEP + 40 % CC - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:28,286 Scale @ A3

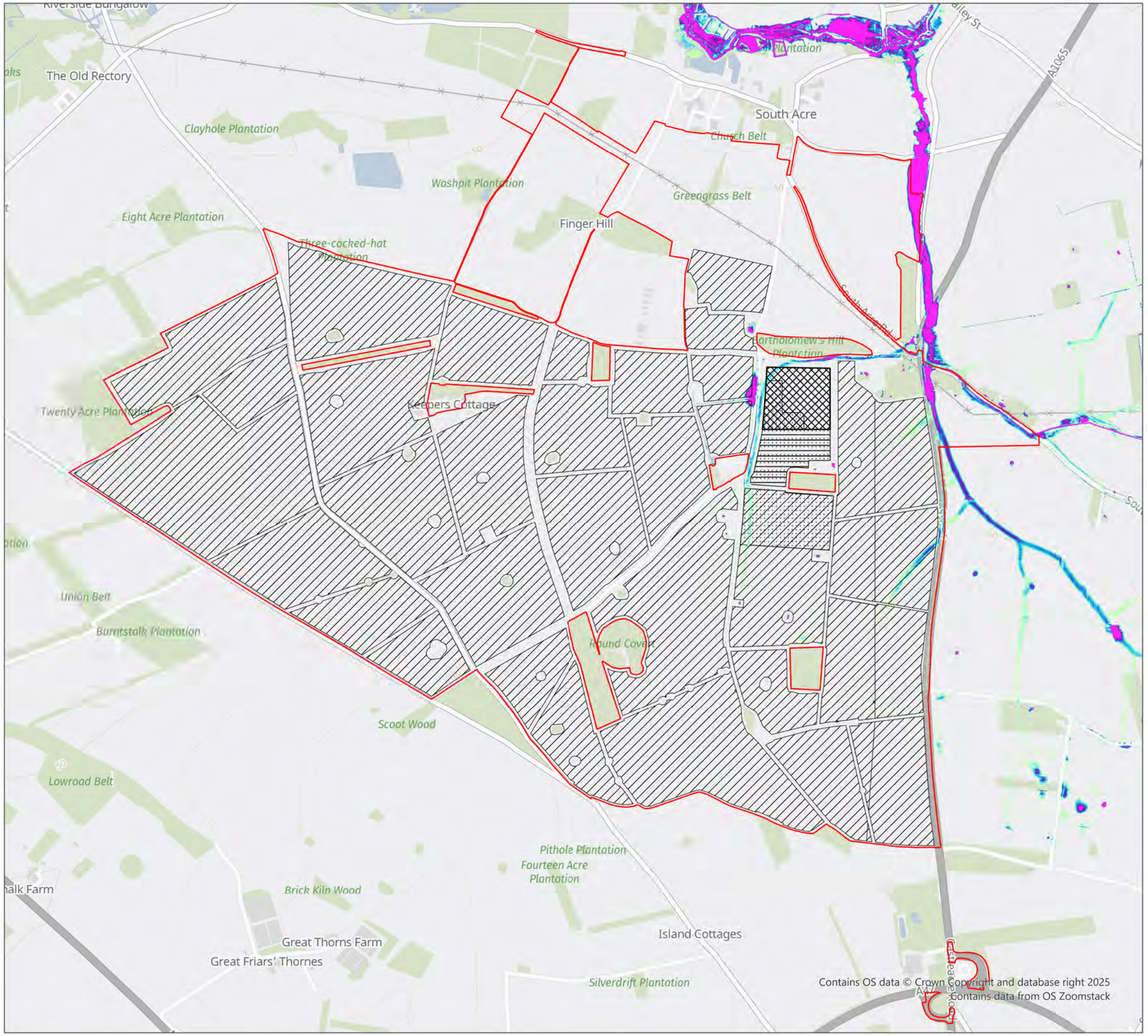
0 0.5 1 km

N

| Ref: 083-FRA-012B | Date: 17/11/2025 |
|---|---|

**Modelled 1 % AEP + 40 % CC Pluvial Flood Depth**
Figure A12-2-6

**The Droves Solar Farm Modelling Report**




THE DROVES
SOLAR FARM
RAINCLOUD

- Work No. 1: Solar PV
- Work No. 2: BESS
- Work No. 3: Customer Substation
- Work No. 4: National Grid Substation

1 % AEP + 40 % CC - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:17,679 Scale @ A3

0 0.3 0.6 km

N

| Ref: 083-FRA-012B | Date: 17/11/2025 |
|---|---|

**Modelled 1 % AEP + 40 % CC Pluvial Flood Depth**
Figure A12-2-6

**The Droves Solar Farm Modelling Report**

THE DROVES
SOLAR FARM
RAINCLOUD

- Work No. 1: Solar PV
- Work No. 2: BESS
- Work No. 3: Customer Substation
- Work No. 4: National Grid Substation

1 % AEP + 40 % CC - Raincloud Model

Depth (m)

- 0 - 0.05
- 0.051 - 0.10
- 0.101 - 0.15
- 0.151 - 0.20
- 0.201 - 0.25
- 0.251 - 0.30
- 0.301 - 0.35
- 0.351 - 0.40
- 0.401 - 0.45
- > 0.45

1:28,286 Scale @ A3

0 0.5 1 km

N

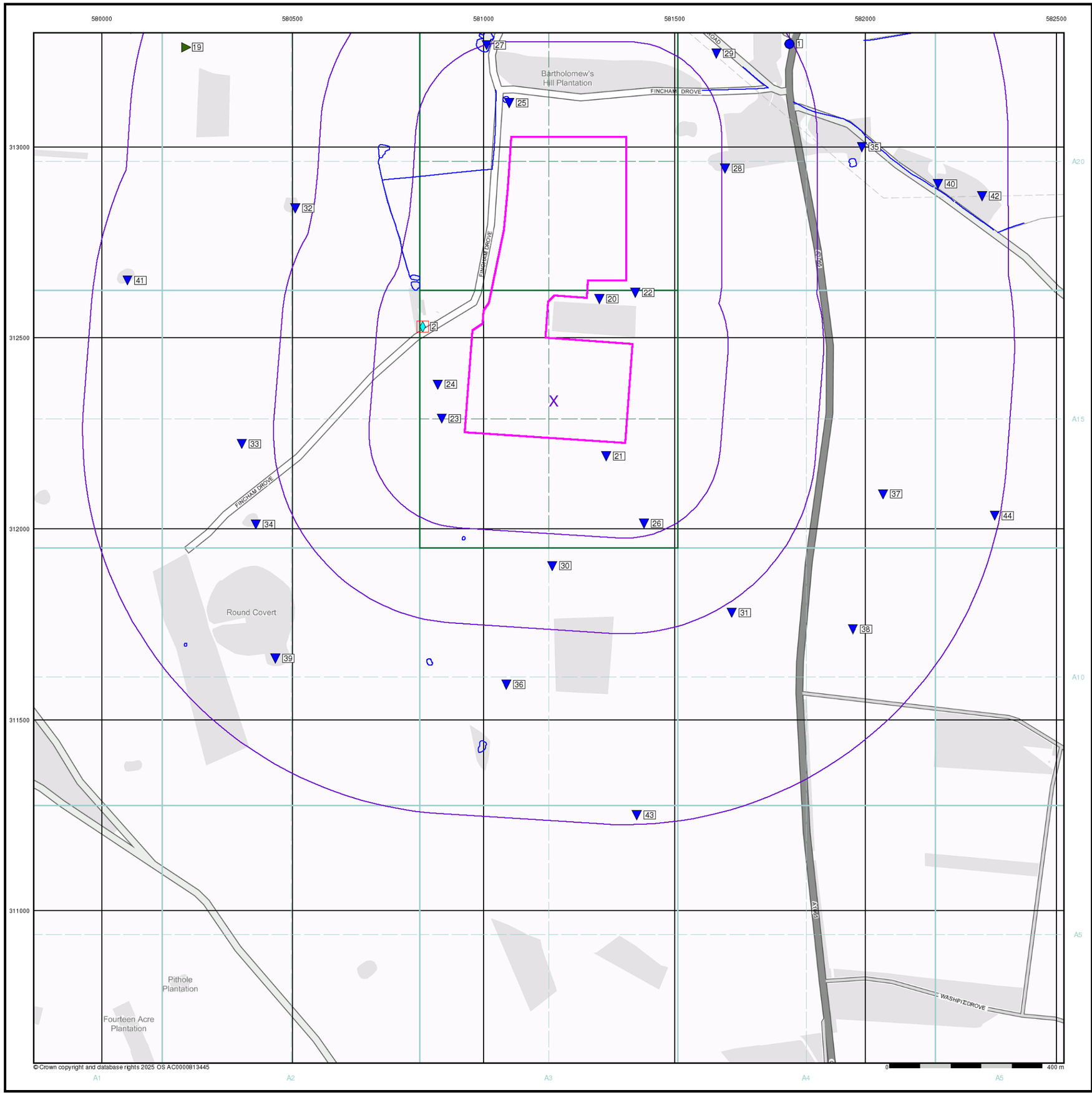
| Ref: 083-FRA-012B | Date: 17/11/2025 |
|---|---|

**Modelled 1 % AEP + 40 % CC Pluvial Flood Depth**
Figure A12-2-6

**The Droves Solar Farm Modelling Report**

THE DROVES
SOLAR FARM

# Annex G: EnviroCheck Report

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## General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

## Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Historical Prosecutions
- Prosecutions
- Registered Radioactive Substance
- River Network or Water Feature
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

## Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

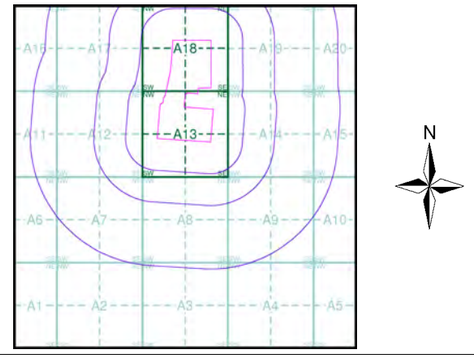
## Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

## Geological

- BGS Recorded Mineral Site

## Site Sensitivity Map - Slice A




## Order Details

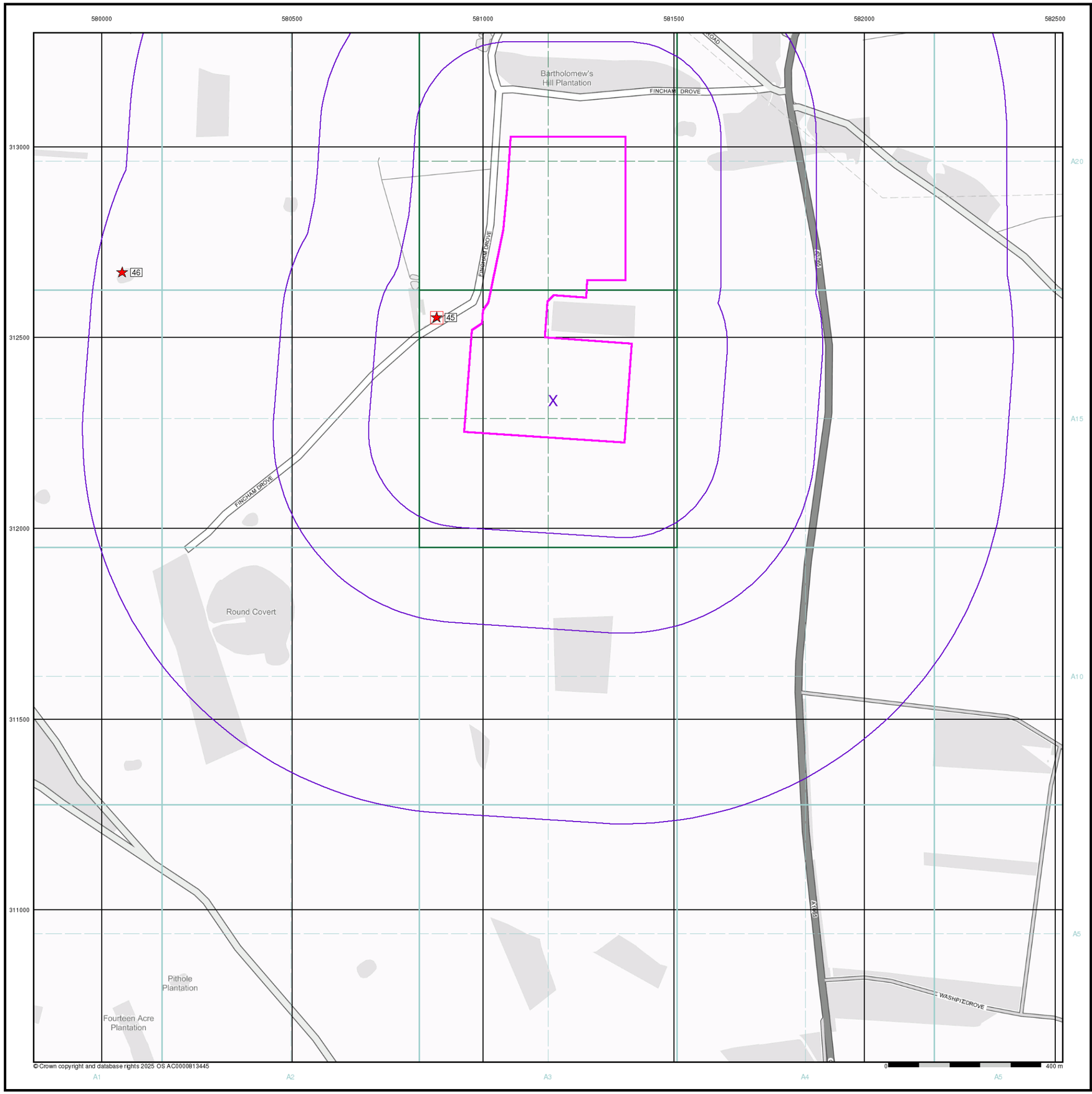
| | |
|---|---|
| Order Number: | 389564812_1_1 |
| Customer Ref: | 083 |
| National Grid Reference: | 581180, 312330 |
| Slice: | A |
| Site Area (Ha): | 25.74 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 581170,312625


Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

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## Industrial Land Use Map

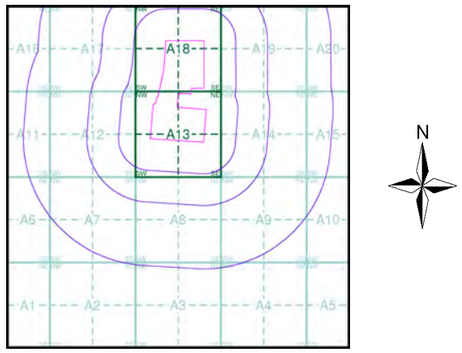
### General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

### Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Points of Interest - Commercial Services
- Points of Interest - Education and Health
- Points of Interest - Manufacturing and Production
- Points of Interest - Public Infrastructure
- Points of Interest - Recreational and Environmental
- Underground Electrical Cables

## Industrial Land Use Map - Slice A




## Order Details

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|---|---|
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| Customer Ref: | 083 |
| National Grid Reference: | 581180, 312330 |
| Slice: | A |
| Site Area (Ha): | 25.74 |
| Search Buffer (m): | 1000 |

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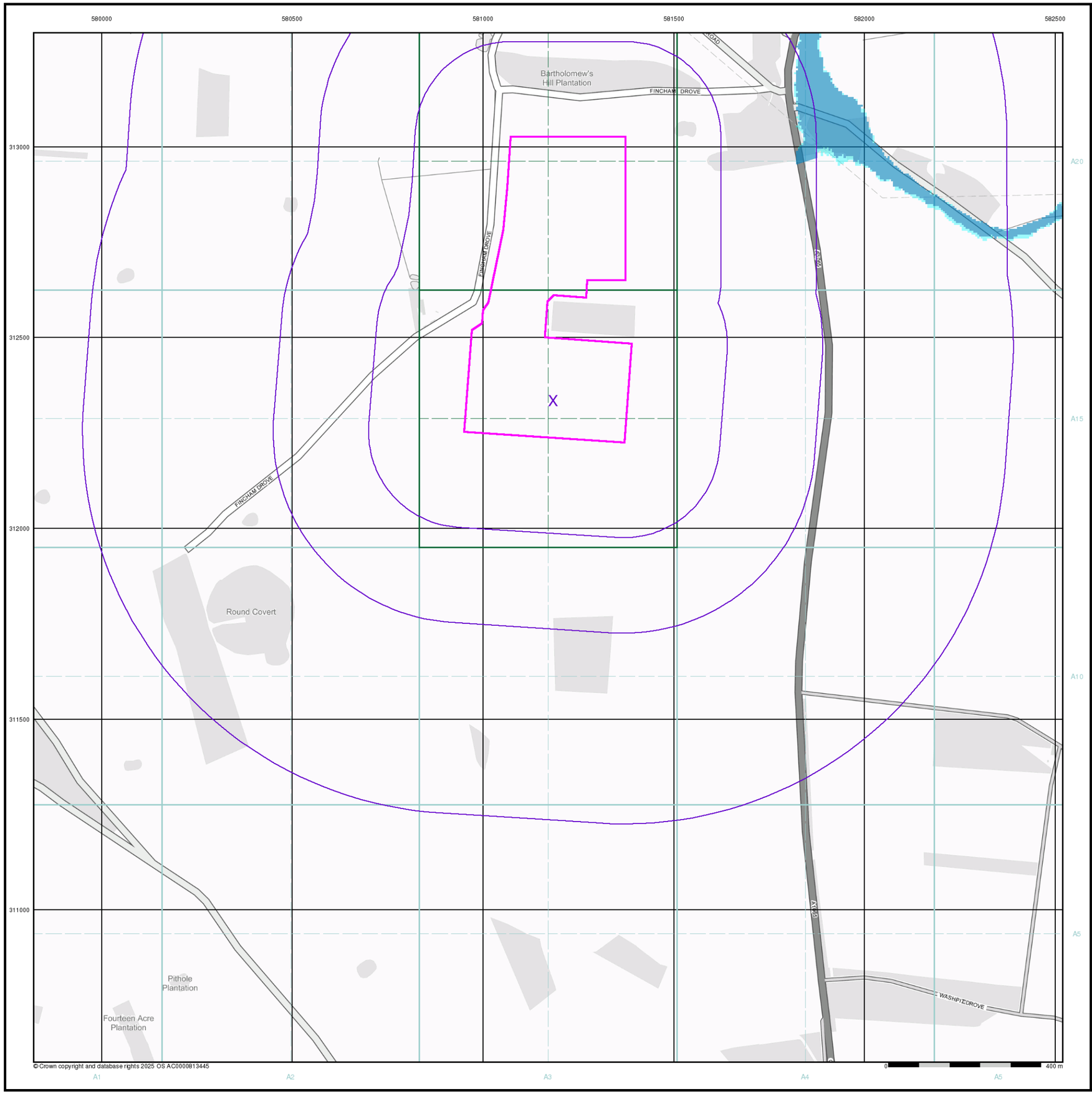


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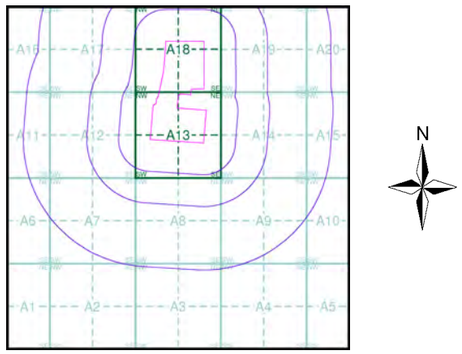
## General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

## Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

## Flood Map - Slice A




## Order Details

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|---|---|
| Order Number: | 389564812_1_1 |
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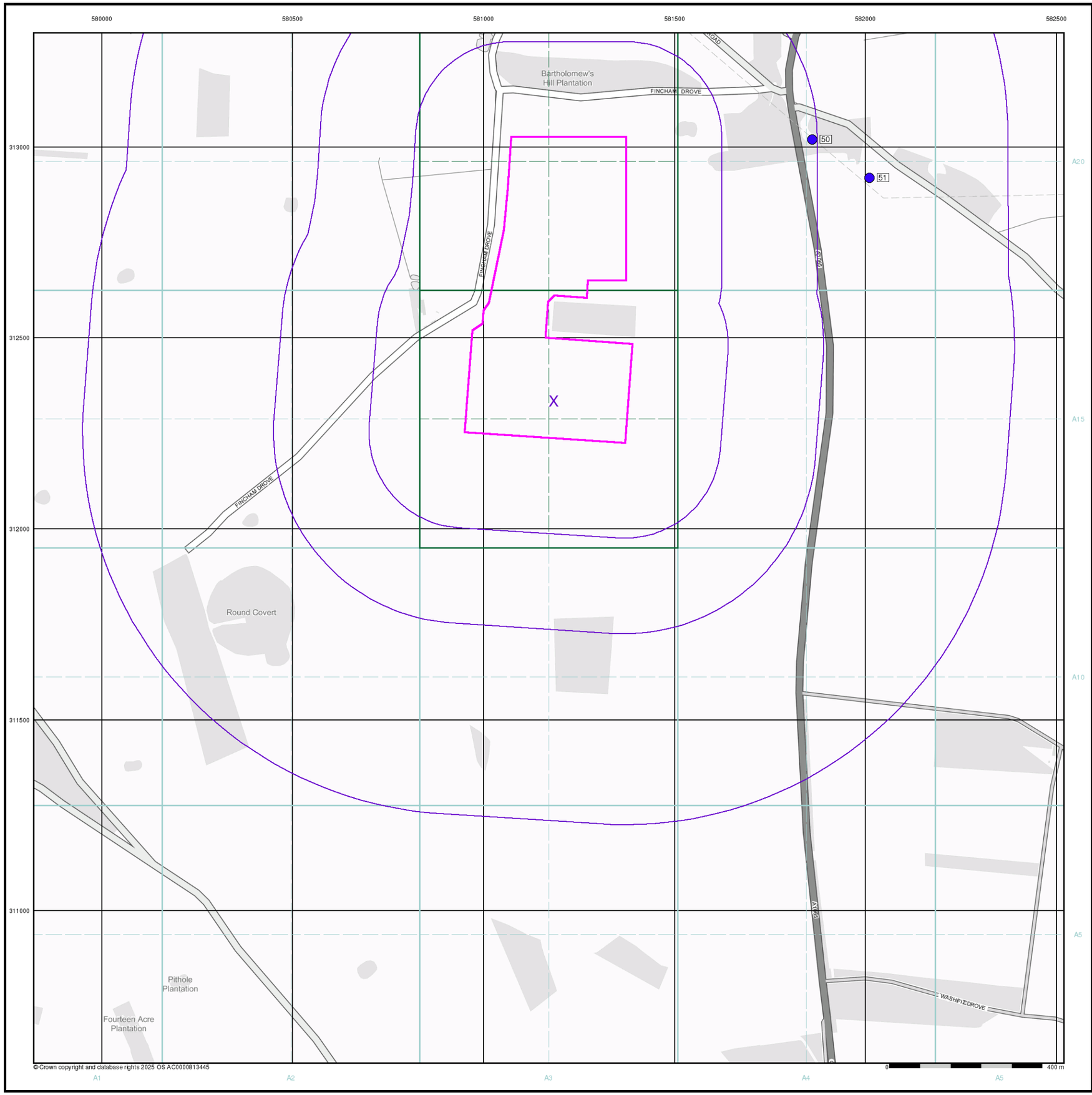
| National Grid Reference: | 581180, 312330 |
| Slice: | A |
| Site Area (Ha): | 25.74 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 581170,312625

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




Envirocheck®

LANDMARK INFORMATION GROUP®

## General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- 8 Map ID
- Several of Type at Location

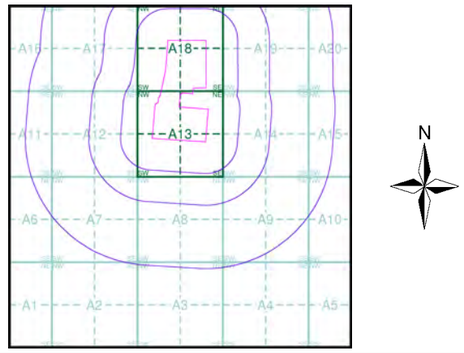
## Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

## Borehole Map - Slice A




## Order Details

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|---|---|
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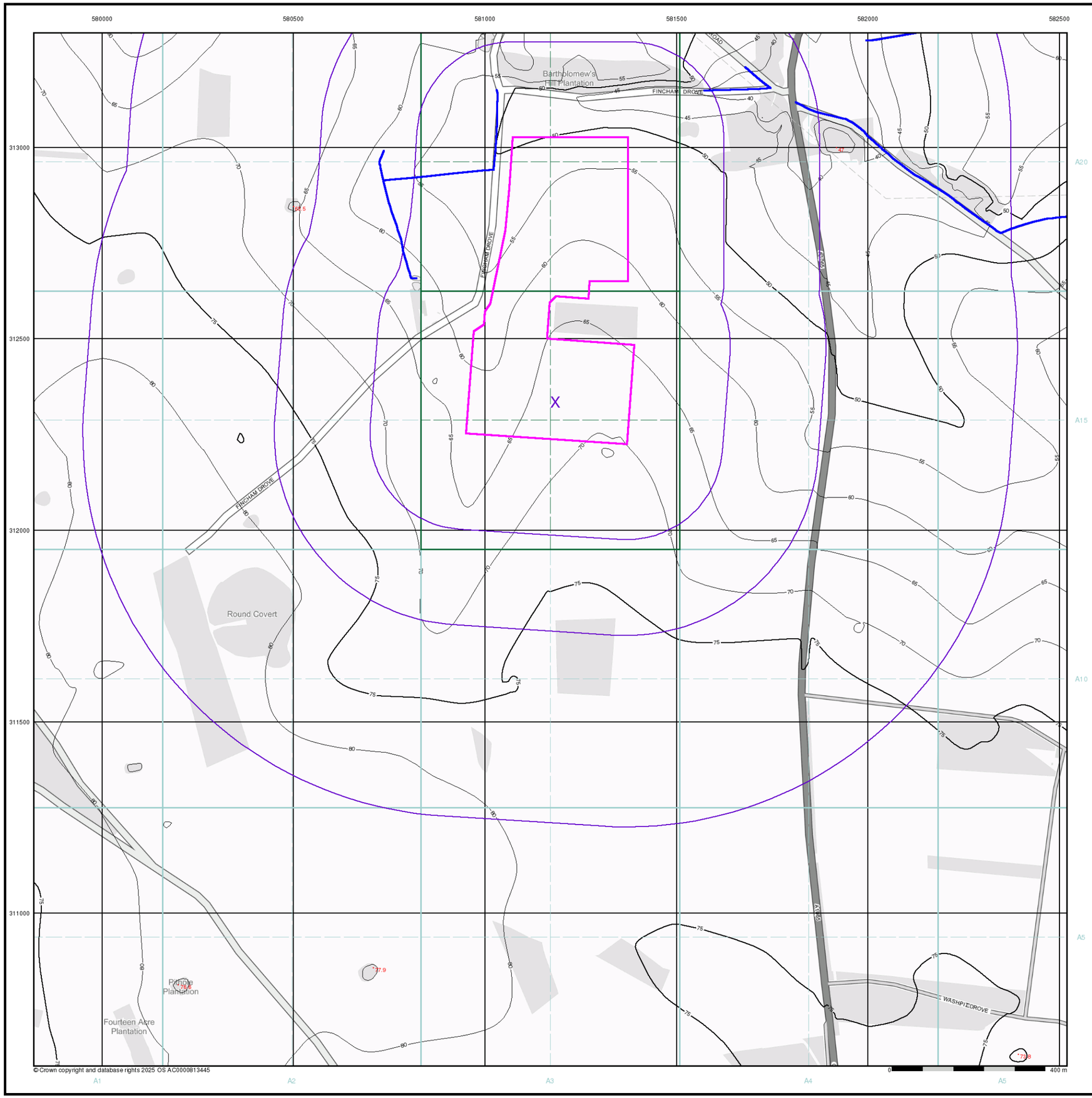
| Customer Ref: | 083 |
| National Grid Reference: | 581180, 312330 |
| Slice: | A |
| Site Area (Ha): | 25.74 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 581170,312625

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

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## General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

## OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

## Contours (height in meters)

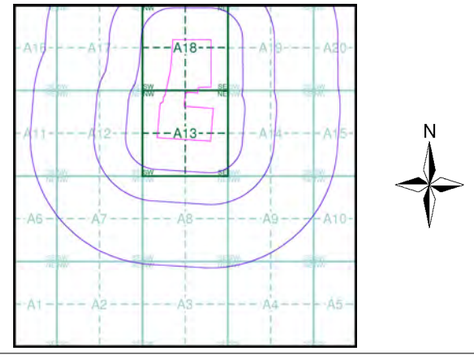
Standard Contour 105 100 95

Master Contour

Spot Height 167.3

- MLW Mean Low Water
- MHW Mean High Water

## OS Water Network Map - Slice A

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| | |
|---|---|
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| Customer Ref: | 083 |
| National Grid Reference: | 581180, 312330 |
| Slice: | A |
| Site Area (Ha): | 25.74 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 581170,312625


Landmark INFORMATION GROUP

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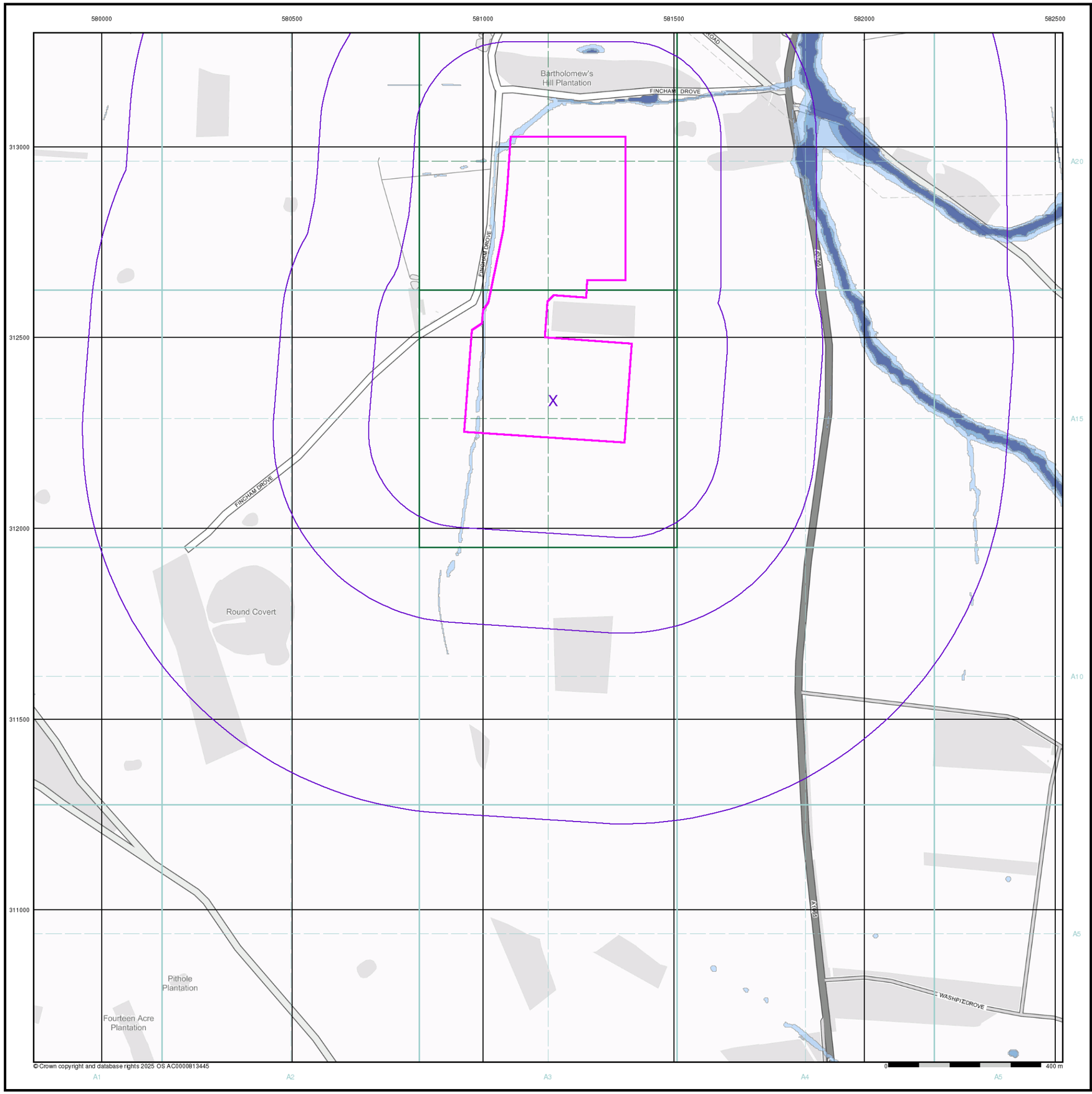
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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## General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

## Risk of Flooding from Surface Water

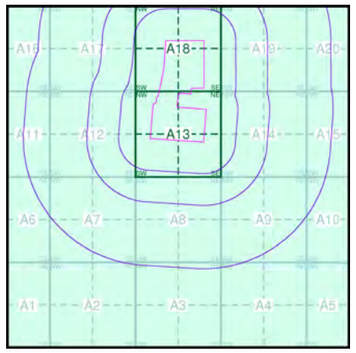
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

## Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

## EA/NRW Suitability Map - Slice A




## Order Details

| | |
|---|---|
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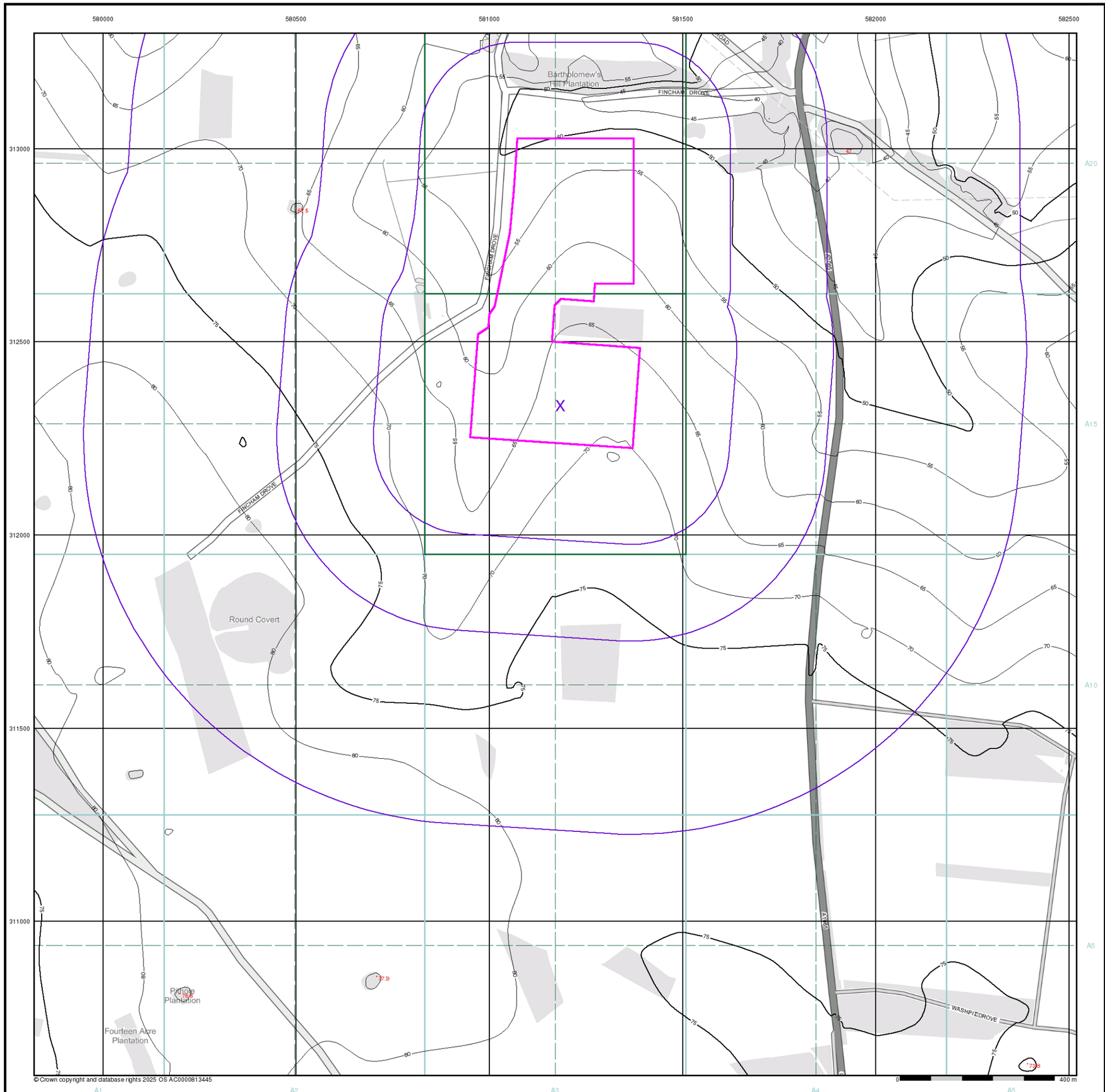
| National Grid Reference: | 581180, 312330 |
| Slice: | A |
| Site Area (Ha): | 25.74 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 581170,312625

Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk




# Envirocheck®

LANDMARK INFORMATION GROUP®

## WFD Surface Waters Map

### General

Specified Site | Specified Buffer(s) | Bearing Reference Point

Slice | Map ID

### Water Framework Directive - Surface Water Quality

- High
- Good
- Moderate
- Poor
- Bad

### Contours (height in meters)

Standard Contour

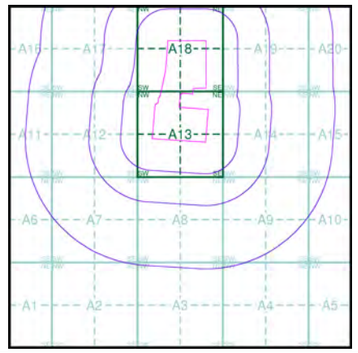
Master Contour

Spot Height 167.3

MLW Mean Low Water

MHW Mean High Water

## WFD Surface Waters Map - Slice A




## Order Details

| | |
|---|---|
| Order Number: | 389564812_1_1 |
| Customer Ref: | 083 |
| National Grid Reference: | 581180, 312330 |
| Slice: | A |
| Site Area (Ha): | 25.74 |
| Search Buffer (m): | 1000 |

## Site Details

Site at 581170,312625


Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

# Envirocheck® Report:

## Datasheet

### Order Details:

**Order Number:**
389564812_1_1

**Customer Reference:**
083

**National Grid Reference:**
581180, 312330

**Slice:**
A

**Site Area (Ha):**
25.74

**Search Buffer (m):**
1000

### Site Details:
Site at 581170,312625

### Client Details:
Mr L Nevins
Raincloud Consulting Ltd
WESTMINSTER PLACE
York
YO26 6RW

Envirocheck®
LANDMARK INFORMATION GROUP®

# Contents


| Report Section | Page Number |
|---|---|
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| Hazardous Substances | - |
| Geological | 13 |
| Industrial Land Use | 21 |
| Sensitive Land Use | 22 |
| Data Currency | 23 |
| Data Suppliers | 28 |
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**Introduction**

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.
In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.



**Report Version v53.0**

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# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---|---|---|---|---|---|
| **Agency & Hydrological** | | | | | |
| BGS Groundwater Flooding Susceptibility | pg 1 | Yes | | Yes | n/a |
| Contaminated Land Register Entries and Notices | | | | | |
| Discharge Consents | | | | | |
| Prosecutions | | | | | |
| Enforcement and Prohibition Notices | | | | | |
| Integrated Pollution Controls | | | | | |
| Integrated Pollution Prevention And Control | | | | | |
| Local Authority Integrated Pollution Prevention And Control | | | | | |
| Local Authority Pollution Prevention and Controls | | | | | |
| Local Authority Pollution Prevention and Control Enforcements | | | | | |
| Nearest Surface Water Feature | pg 1 | | Yes | | |
| Pollution Incidents to Controlled Waters | pg 1 | | | | 1 |
| Historical Prosecutions | | | | | |
| Registered Radioactive Substances | | | | | |
| Substantiated Pollution Incident Register | | | | | |
| Water Abstractions | pg 1 | | 6 | | (*18) |
| Water Industry Act Referrals | | | | | |
| Groundwater Vulnerability Map | pg 7 | Yes | n/a | n/a | n/a |
| Groundwater Vulnerability - Soluble Rock Risk | pg 8 | 3 | n/a | n/a | n/a |
| Groundwater Vulnerability - Local Information | | | n/a | n/a | n/a |
| Bedrock Aquifer Designations | pg 8 | Yes | n/a | n/a | n/a |
| Superficial Aquifer Designations | pg 8 | Yes | n/a | n/a | n/a |
| Source Protection Zones | pg 8 | 2 | | | |
| Extreme Flooding from Rivers or Sea without Defences | | | | n/a | n/a |
| Flooding from Rivers or Sea without Defences | | | | n/a | n/a |
| Areas Benefiting from Flood Defences | | | | n/a | n/a |
| Flood Water Storage Areas | | | | n/a | n/a |
| Flood Defences | | | | n/a | n/a |
| OS Water Network Lines | pg 9 | | 4 | 3 | 7 |
| Water Framework Directive - Catchment | pg 10 | Yes | | | Yes |
| Water Framework Directive - Groundwater | pg 11 | Yes | | | |
| Water Framework Directive - Surface Waters | | | | | |

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# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---|---|---|---|---|---|
| **Waste** | | | | | |
| BGS Recorded Landfill Sites | | | | | |
| Historical Landfill Sites | | | | | |
| Integrated Pollution Control Registered Waste Sites | | | | | |
| Licensed Waste Management Facilities (Landfill Boundaries) | | | | | |
| Licensed Waste Management Facilities (Locations) | | | | | |
| Local Authority Landfill Coverage | pg 12 | 2 | n/a | n/a | n/a |
| Local Authority Recorded Landfill Sites | | | | | |
| Potentially Infilled Land (Non-Water) | | | | | |
| Potentially Infilled Land (Water) | pg 12 | | | | 1 |
| Registered Landfill Sites | | | | | |
| Registered Waste Transfer Sites | | | | | |
| Registered Waste Treatment or Disposal Sites | | | | | |
| **Hazardous Substances** | | | | | |
| Control of Major Accident Hazards Sites (COMAH) | | | | | |
| Explosive Sites | | | | | |
| Notification of Installations Handling Hazardous Substances (NIHHS) | | | | | |
| Planning Hazardous Substance Consents | | | | | |
| Planning Hazardous Substance Enforcements | | | | | |

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# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---|---|---|---|---|---|
| **Geological** | | | | | |
| BGS 1:625,000 Solid Geology | pg 13 | Yes | n/a | n/a | n/a |
| BGS Estimated Soil Chemistry | pg 13 | Yes | Yes | Yes | Yes |
| BGS Recorded Mineral Sites | pg 14 | | 7 | 4 | 14 |
| BGS Urban Soil Chemistry | | | | | |
| BGS Urban Soil Chemistry Averages | | | | | |
| CBSCB Compensation District | | | n/a | n/a | n/a |
| Coal Mining Affected Areas | | | n/a | n/a | n/a |
| Mining Instability | pg 18 | Yes | n/a | n/a | n/a |
| Man-Made Mining Cavities | pg 19 | | 1 | | |
| Natural Cavities | | | | | |
| Non Coal Mining Areas of Great Britain | pg 19 | Yes | | n/a | n/a |
| Potential for Collapsible Ground Stability Hazards | pg 19 | Yes | | n/a | n/a |
| Potential for Compressible Ground Stability Hazards | | | | n/a | n/a |
| Potential for Ground Dissolution Stability Hazards | pg 19 | Yes | Yes | n/a | n/a |
| Potential for Landslide Ground Stability Hazards | pg 19 | Yes | Yes | n/a | n/a |
| Potential for Running Sand Ground Stability Hazards | pg 19 | Yes | | n/a | n/a |
| Potential for Shrinking or Swelling Clay Ground Stability Hazards | pg 20 | Yes | | n/a | n/a |
| Radon Potential - Radon Affected Areas | | | n/a | n/a | n/a |
| Radon Potential - Radon Protection Measures | | | n/a | n/a | n/a |
| **Industrial Land Use** | | | | | |
| Contemporary Trade Directory Entries | | | | | |
| Fuel Station Entries | | | | | |
| Points of Interest - Commercial Services | | | | | |
| Points of Interest - Education and Health | | | | | |
| Points of Interest - Manufacturing and Production | pg 21 | | 5 | | 1 |
| Points of Interest - Public Infrastructure | | | | | |
| Points of Interest - Recreational and Environmental | | | | | |
| Underground Electrical Cables | | | | | |

# Summary

| Data Type | Page Number | On Site | 0 to 250m | 251 to 500m | 501 to 1000m (*up to 2000m) |
|---|---|---|---|---|---|
| **Sensitive Land Use** | | | | | |
| Ancient Woodland | | | | | |
| Areas of Adopted Green Belt | | | | | |
| Areas of Unadopted Green Belt | | | | | |
| Areas of Outstanding Natural Beauty | | | | | |
| Environmentally Sensitive Areas | | | | | |
| Forest Parks | | | | | |
| Local Nature Reserves | | | | | |
| Marine Nature Reserves | | | | | |
| National Nature Reserves | | | | | |
| National Parks | | | | | |
| Nitrate Sensitive Areas | | | | | |
| Nitrate Vulnerable Zones | pg 22 | 2 | | | 1 |
| Ramsar Sites | | | | | |
| Sites of Special Scientific Interest | | | | | |
| Special Areas of Conservation | | | | | |
| Special Protection Areas | | | | | |
| World Heritage Sites | | | | | |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A13NE (S) | 0 | 1 | 581184 312335 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Limited Potential for Groundwater Flooding to Occur | A19SW (NE) | 335 | 1 | 581800 312750 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level | A19SW (NE) | 427 | 1 | 581800 312900 |
| | **BGS Groundwater Flooding Susceptibility**<br>Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level | A19NE (NE) | 445 | 1 | 581850 313100 |
| | **Nearest Surface Water Feature** | A18SW (N) | 42 | - | 581024 312960 |
| 1 | **Pollution Incidents to Controlled Waters**<br>Property Type: Road<br>Location: Kings Lynn District<br>Authority: Environment Agency, Anglian Region<br>Pollutant: Oils - Other Oil<br>Note: Tributary Of Nar<br>Incident Date: 4th November 1994<br>Incident Reference: 1581<br>Catchment Area: Not Given<br>Receiving Water: Potential Groundwater<br>Cause of Incident: Fire<br>Incident Severity: Category 3 - Minor Incident<br>Positional Accuracy: Located by supplier to within 100m | A19NW (NE) | 508 | 2 | 581800 313300 |
| 2 | **Water Abstractions**<br>Operator: Priory Pigs<br>Licence Number: 6/33/58/*G/0248<br>Permit Version: 6<br>Location: Borehole At South Acre<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Farming And Domestic<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 March<br>Permit Start Date: 14th December 2023<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A13NW (NW) | 129 | 2 | 580847 312553 |
| 2 | **Water Abstractions**<br>Operator: Priory Pigs<br>Licence Number: 6/33/58/*G/0248<br>Permit Version: 4<br>Location: Borehole At South Acre<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Farming And Domestic<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st April 2018<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A13NW (NW) | 132 | 2 | 580840 312530 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 2 | **Water Abstractions**<br>Operator: Priory Pigs<br>Licence Number: 6/33/58/*G/0248<br>Permit Version: 5<br>Location: Borehole At South Acre<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Farming And Domestic<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 29th March 2018<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A13NW (NW) | 132 | 2 | 580840 312530 |
| 2 | **Water Abstractions**<br>Operator: Narstate Ltd<br>Licence Number: 6/33/58/*G/0248<br>Permit Version: 3<br>Location: Borehole At South Acre<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Farming And Domestic<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st April 2008<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A13NW (NW) | 132 | 2 | 580840 312530 |
| 2 | **Water Abstractions**<br>Operator: Narstate Ltd<br>Licence Number: 6/33/58/*G/0248<br>Permit Version: 2<br>Location: Borehole At South Acre<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Farming And Domestic<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 24th November 2006<br>Permit End Date: 31st March 2008<br>Positional Accuracy: Located by supplier to within 10m | A13NW (NW) | 132 | 2 | 580840 312530 |
| 2 | **Water Abstractions**<br>Operator: Narstate Ltd<br>Licence Number: 6/33/58/*G/0248<br>Permit Version: 1<br>Location: Borehole At South Acre<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Farming And Domestic<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 1st April 2006<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A13NW (NW) | 132 | 2 | 580840 312530 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: Wales Family Partnership<br>Licence Number: 6/33/58/*s/035<br>Permit Version: Not Supplied<br>Location: Drains<br>Authority: Environment Agency, Anglian Region<br>Abstraction: Spray Irrigation<br>Abstraction Type: Not Supplied<br>Source: Stream<br>Daily Rate (m3): 12<br>Yearly Rate (m3): 436400<br>Details: Status: Revoked<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A16NE (NW) | 1068 | 2 | 580001 313001 |
| | **Water Abstractions**<br>Operator: South Pickenham Estate Co Ltd<br>Licence Number: 6/33/58/*G/0274/R01<br>Permit Version: 1<br>Location: Borehole At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 October<br>Permit Start Date: 1st April 2016<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1389 | 2 | 582480 311390 |
| | **Water Abstractions**<br>Operator: South Pickenham Estate Co Ltd<br>Licence Number: 6/33/58/*G/0274/R01<br>Permit Version: 1<br>Location: Borehole At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Storage<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 March<br>Permit Start Date: 1st April 2016<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1389 | 2 | 582480 311390 |
| | **Water Abstractions**<br>Operator: Palgrave Farming Co Ltd<br>Licence Number: 6/33/58/*G/0274<br>Permit Version: 2<br>Location: Borehole At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 October<br>Permit Start Date: 11th February 2008<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1389 | 2 | 582480 311390 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: Palgrave Farming Co Ltd<br>Licence Number: 6/33/58/*G/0274<br>Permit Version: 2<br>Location: Borehole At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Storage<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 11th February 2008<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1389 | 2 | 582480 311390 |
| | **Water Abstractions**<br>Operator: Palgrave Farming Co Ltd<br>Licence Number: 6/33/58/*G/0274<br>Permit Version: 1<br>Location: Borehole At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 October<br>Permit Start Date: 5th April 2007<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1389 | 2 | 582480 311390 |
| | **Water Abstractions**<br>Operator: Palgrave Farming Co Ltd<br>Licence Number: 6/33/58/*G/0274<br>Permit Version: 1<br>Location: Borehole At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Storage<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 January<br>Authorised End: 31 December<br>Permit Start Date: 5th April 2007<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1389 | 2 | 582480 311390 |
| | **Water Abstractions**<br>Operator: Palgrave Farming Co Ltd<br>Licence Number: 6/33/58/*G/0239<br>Permit Version: 101<br>Location: Borehole No.2 At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 October<br>Permit Start Date: 15th June 2006<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1389 | 2 | 582480 311390 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: British Field Products Ltd<br>Licence Number: 6/33/58/*g/186<br>Permit Version: Not Supplied<br>Location: Boreholesporle<br>Authority: Environment Agency, Anglian Region<br>Abstraction: Spray Irrigation<br>Abstraction Type: Not Supplied<br>Source: Well And Borehole<br>Daily Rate (m3): 185<br>Yearly Rate (m3): 4800000<br>Details: Not Supplied<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 100m | A10SW (SE) | 1389 | 2 | 582480 311390 |
| | **Water Abstractions**<br>Operator: British Field Products Ltd<br>Licence Number: 6/33/58/*g/224<br>Permit Version: Not Supplied<br>Location: Borehole At, SWAFFHAM<br>Authority: Environment Agency, Anglian Region<br>Abstraction: Spray Irrigation<br>Abstraction Type: Not Supplied<br>Source: Well And Borehole<br>Daily Rate (m3): 253<br>Yearly Rate (m3): 4800000<br>Details: C Chalk 11; Status: Revoked<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1392 | 2 | 582480 311385 |
| | **Water Abstractions**<br>Operator: Palgrave Farming Co Ltd<br>Licence Number: 6/33/58/*G/0239<br>Permit Version: 100<br>Location: Borehole No.2 At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: C Chalk 11; Status: Temporary<br>Authorised Start: 01 April<br>Authorised End: 31 October<br>Permit Start Date: 24th February 1999<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1396 | 2 | 582485 311385 |
| | **Water Abstractions**<br>Operator: The South Pickenham Estate Company Limited<br>Licence Number: 6/33/58/*G/0274/R03<br>Permit Version: 1<br>Location: Borehole At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Storage<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 March<br>Permit Start Date: 1st April 2024<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1403 | 2 | 582487 311377 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: The South Pickenham Estate Company Limited<br>Licence Number: 6/33/58/*G/0274/R03<br>Permit Version: 1<br>Location: Borehole At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 October<br>Permit Start Date: 1st April 2024<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1403 | 2 | 582487 311377 |
| | **Water Abstractions**<br>Operator: South Pickenham Estate Co Ltd<br>Licence Number: 6/33/58/*G/0274/R02<br>Permit Version: 1<br>Location: Borehole At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 October<br>Permit Start Date: 1st April 2018<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1403 | 2 | 582487 311377 |
| | **Water Abstractions**<br>Operator: South Pickenham Estate Co Ltd<br>Licence Number: 6/33/58/*G/0274/R02<br>Permit Version: 1<br>Location: Borehole At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Storage<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 March<br>Permit Start Date: 1st April 2018<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | A10SW (SE) | 1403 | 2 | 582487 311377 |
| | **Water Abstractions**<br>Operator: Palgrave Farming Co Ltd<br>Licence Number: 6/33/58/*G/0239<br>Permit Version: 101<br>Location: Borehole No.1 At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: Not Supplied<br>Authorised Start: 01 April<br>Authorised End: 31 October<br>Permit Start Date: 15th June 2006<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | (S) | 1985 | 2 | 581810 310290 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Abstractions**<br>Operator: British Field Products Ltd<br>Licence Number: 6/33/58/*g/224<br>Permit Version: Not Supplied<br>Location: Borehole At, SWAFFHAM<br>Authority: Environment Agency, Anglian Region<br>Abstraction: Spray Irrigation<br>Abstraction Type: Not Supplied<br>Source: Well And Borehole<br>Daily Rate (m3): 68<br>Yearly Rate (m3): 982000<br>Details: C Chalk 11; Status: Revoked<br>Authorised Start: Not Supplied<br>Authorised End: Not Supplied<br>Permit Start Date: Not Supplied<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | (S) | 1985 | 2 | 581810<br>310290 |
| | **Water Abstractions**<br>Operator: Palgrave Farming Co Ltd<br>Licence Number: 6/33/58/*G/0239<br>Permit Version: 100<br>Location: Borehole No.1 At Swaffham<br>Authority: Environment Agency, Anglian Region<br>Abstraction: General Agriculture: Spray Irrigation - Direct<br>Abstraction Type: Water may be abstracted from a single point<br>Source: Groundwater<br>Daily Rate (m3): Not Supplied<br>Yearly Rate (m3): Not Supplied<br>Details: C Chalk 11; Status: Temporary<br>Authorised Start: 01 April<br>Authorised End: 31 October<br>Permit Start Date: 24th February 1999<br>Permit End Date: Not Supplied<br>Positional Accuracy: Located by supplier to within 10m | (S) | 1990 | 2 | 581810<br>310285 |
| | **Groundwater Vulnerability Map**<br>Combined Classification: Secondary Superficial Aquifer - High Vulnerability<br>Combined Vulnerability: High<br>Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer<br>Pollutant Speed: High<br>Bedrock Flow: Well Connected Fractures<br>Dilution: <300 mm/year<br>Baseflow Index: >70%<br>Superficial Patchiness: <90%<br>Superficial Thickness: 3-10m<br>Superficial Recharge: No Data | A18NW (N) | 0 | 2 | 581162<br>313000 |
| | **Groundwater Vulnerability Map**<br>Combined Classification: Principle Bedrock Aquifer - High Vulnerability<br>Combined Vulnerability: High<br>Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer<br>Pollutant Speed: High<br>Bedrock Flow: Well Connected Fractures<br>Dilution: <300 mm/year<br>Baseflow Index: >70%<br>Superficial Patchiness: <90%<br>Superficial Thickness: 3-10m<br>Superficial Recharge: No Data | A18NE (N) | 0 | 2 | 581184<br>313000 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Groundwater Vulnerability Map**<br>Combined Classification: Principle Bedrock Aquifer - High Vulnerability<br>Combined Vulnerability: High<br>Combined Aquifer: Productive Bedrock Aquifer, No Superficial Aquifer<br>Pollutant Speed: High<br>Bedrock Flow: Well Connected Fractures<br>Dilution: <300 mm/year<br>Baseflow Index: >70%<br>Superficial Patchiness: <90%<br>Superficial Thickness: <3m<br>Superficial Recharge: No Data | A13NE (S) | 0 | 2 | 581184 312335 |
| | **Groundwater Vulnerability Map**<br>Combined Classification: Secondary Superficial Aquifer - High Vulnerability<br>Combined Vulnerability: High<br>Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer<br>Pollutant Speed: High<br>Bedrock Flow: Well Connected Fractures<br>Dilution: <300 mm/year<br>Baseflow Index: >70%<br>Superficial Patchiness: <90%<br>Superficial Thickness: <3m<br>Superficial Recharge: Low | A13NW (W) | 0 | 2 | 581000 312335 |
| | **Groundwater Vulnerability Map**<br>Combined Classification: Secondary Superficial Aquifer - High Vulnerability<br>Combined Vulnerability: High<br>Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer<br>Pollutant Speed: High<br>Bedrock Flow: Well Connected Fractures<br>Dilution: <300 mm/year<br>Baseflow Index: >70%<br>Superficial Patchiness: <90%<br>Superficial Thickness: <3m<br>Superficial Recharge: No Data | A13NW (W) | 0 | 2 | 581028 312344 |
| | **Groundwater Vulnerability - Soluble Rock Risk**<br>Classification: Significant Risk - Low Possibility | A18NE (N) | 0 | 2 | 581184 313000 |
| | **Groundwater Vulnerability - Soluble Rock Risk**<br>Classification: Significant Risk - Low Possibility | A13NW (W) | 0 | 2 | 581000 312335 |
| | **Groundwater Vulnerability - Soluble Rock Risk**<br>Classification: Significant Risk - Low Possibility | A13NE (S) | 0 | 2 | 581184 312335 |
| | **Bedrock Aquifer Designations**<br>Aquifer Designation: Principal Aquifer | A13NE (S) | 0 | 2 | 581184 312335 |
| | **Superficial Aquifer Designations**<br>Aquifer Designation: Secondary Aquifer - Undifferentiated | A13NW (W) | 0 | 2 | 581028 312344 |
| 3 | **Source Protection Zones**<br>Name: Not Supplied<br>Source: Environment Agency, Head Office<br>Reference: Not Supplied<br>Type: Zone III (Total Catchment): The total area needed to support the discharge from the protected groundwater source. | A13NE (S) | 0 | 2 | 581184 312335 |
| 4 | **Source Protection Zones**<br>Name: Not Supplied<br>Source: Environment Agency, Head Office<br>Reference: Not Supplied<br>Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater. | A13NE (S) | 0 | 2 | 581184 312335 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
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| | **Extreme Flooding from Rivers or Sea without Defences**<br>None | | | | |
| | **Flooding from Rivers or Sea without Defences**<br>None | | | | |
| | **Areas Benefiting from Flood Defences**<br>None | | | | |
| | **Flood Water Storage Areas**<br>None | | | | |
| | **Flood Defences**<br>None | | | | |
| 5 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 498.8<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A18SW (N) | 42 | 3 | 581022 312941 |
| 6 | **OS Water Network Lines**<br>Watercourse Form: Lake<br>Watercourse Length: 12.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A17SE (NW) | 199 | 3 | 580821 312658 |
| 7 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 266.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A17SE (NW) | 210 | 3 | 580808 312657 |
| 8 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 257.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A19NW (NE) | 234 | 3 | 581573 313148 |
| 9 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 60.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A17SE (NW) | 330 | 3 | 580734 312913 |
| 10 | **OS Water Network Lines**<br>Watercourse Form: Lake<br>Watercourse Length: 21.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A17NE (NW) | 333 | 3 | 580728 312972 |
| 11 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 434.3<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A19NW (NE) | 449 | 3 | 581812 313118 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 12 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 296.6<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A19NE (NE) | 672 | 3 | 581996 313279 |
| 13 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 6.2<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A19SE (NE) | 804 | 3 | 582177 312896 |
| 14 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 59.5<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A19SE (NE) | 809 | 3 | 582182 312892 |
| 15 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 6.1<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A20SW (NE) | 857 | 3 | 582231 312858 |
| 16 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 122.2<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A20SW (NE) | 863 | 3 | 582236 312855 |
| 17 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 14.4<br>Watercourse Level: Underground<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A20SW (E) | 961 | 3 | 582334 312783 |
| 18 | **OS Water Network Lines**<br>Watercourse Form: Inland river<br>Watercourse Length: 426.9<br>Watercourse Level: On ground surface<br>Permanent: True<br>Watercourse Name: Not Supplied<br>Catchment Name: Cam Ely Ouse and South Level<br>Primacy: 1 | A20SW (E) | 974 | 3 | 582347 312776 |
| | **Water Framework Directive - Catchment**<br>Class Code: River Catchment<br>WaterBody Name: Nar upstream of Abbey Farm<br>WaterBody ID: GB105033047791<br>Operational Catchment: North West Norfolk Rivers<br>Management Catchment: North West Norfolk<br>Catchment Name: North West Norfolk | A13NE (S) | 0 | 2 | 581184 312335 |
| | **Water Framework Directive - Catchment**<br>Class Code: River Catchment<br>WaterBody Name: Gadder<br>WaterBody ID: GB105033047880<br>Operational Catchment: Wissey<br>Management Catchment: Cam and Ely Ouse<br>Catchment Name: Cam & Ely Ouse | A8SE (S) | 709 | 2 | 581331 311517 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Water Framework Directive - Groundwater**<br>Waterbody Name: North West Norfolk Chalk<br>Waterbody ID: GB40501G400200<br>URL Address: https://environment.data.gov.uk/catchment-planning/WaterBody/GB40501G400200<br>Overall Rating: Poor<br>Chemical Rating: Poor<br>Quantitative Measure: Poor<br>Year: 2019 | A13NE (S) | 0 | 2 | 581184 312335 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Local Authority Landfill Coverage**<br>Name: Norfolk County Council<br>- Has supplied landfill data | | 0 | 4 | 581184<br>312335 |
| | **Local Authority Landfill Coverage**<br>Name: Breckland District Council<br>- Has no landfill data to supply | | 0 | 5 | 581184<br>312335 |
| 19 | **Potentially Infilled Land (Water)**<br>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc)<br>Date of Mapping: 1906 | A17NW (NW) | 887 | 6 | 580217<br>313261 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS 1:625,000 Solid Geology**<br>Description: White Chalk Subgroup | A13NE (S) | 0 | 1 | 581184 312335 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: <15 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 40 - 60 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A13NW (W) | 0 | 1 | 581028 312344 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: <15 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 40 - 60 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: <15 mg/kg | A13NE (S) | 0 | 1 | 581184 312335 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 40 - 60 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A18NW (N) | 0 | 1 | 581162 313000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 20 - 40 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: <15 mg/kg | A18NE (N) | 62 | 1 | 581225 313089 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 20 - 40 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: <15 mg/kg | A19NW (NE) | 279 | 1 | 581676 312985 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: <15 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 40 - 60 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A19NE (NE) | 504 | 1 | 581877 313000 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 20 - 40 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: <15 mg/kg | A19SE (NE) | 553 | 1 | 581935 312945 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: <15 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 40 - 60 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A19NE (NE) | 627 | 1 | 582000 313000 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: 15 - 25 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 20 - 40 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: <15 mg/kg | A19SE (NE) | 729 | 1 | 582166 312927 |
| | **BGS Estimated Soil Chemistry**<br>Source: British Geological Survey, National Geoscience Information Service<br>Soil Sample Type: Rural Soil<br>Arsenic Concentration: <15 mg/kg<br>Cadmium Concentration: <1.8 mg/kg<br>Chromium Concentration: 40 - 60 mg/kg<br>Lead Concentration: <100 mg/kg<br>Nickel Concentration: 15 - 30 mg/kg | A7NW (SW) | 864 | 1 | 580265 311725 |
| 20 | **BGS Recorded Mineral Sites**<br>Site Name: South Acre Pit<br>Location: South Acre, King'S Lynn, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194420<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A13NE (NE) | 32 | 1 | 581302 312606 |
| 21 | **BGS Recorded Mineral Sites**<br>Site Name: Swaffham Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194430<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A13SE (SE) | 34 | 1 | 581320 312195 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 22 | **BGS Recorded Mineral Sites**<br>Site Name: South Acre Pit<br>Location: South Acre, King'S Lynn, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194421<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A13NE (NE) | 36 | 1 | 581396 312623 |
| 23 | **BGS Recorded Mineral Sites**<br>Site Name: Fincham Drove Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194419<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A13NW (W) | 63 | 1 | 580890 312293 |
| 24 | **BGS Recorded Mineral Sites**<br>Site Name: Fincham Drove Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194418<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A13NW (W) | 81 | 1 | 580879 312382 |
| 25 | **BGS Recorded Mineral Sites**<br>Site Name: Bartholomew'S Hills Plantation Pit<br>Location: South Acre, King'S Lynn, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194391<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Quaternary<br>Geology: Lowestoft Formation<br>Commodity: Sand and Gravel<br>Positional Accuracy: Located by supplier to within 10m | A18NW (N) | 94 | 1 | 581066 313119 |
| 26 | **BGS Recorded Mineral Sites**<br>Site Name: Swaffham Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194431<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A13SE (SE) | 213 | 1 | 581419 312018 |
| 27 | **BGS Recorded Mineral Sites**<br>Site Name: Herrington'S Pit<br>Location: South Acre, King'S Lynn, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194390<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Quaternary<br>Geology: Lowestoft Formation<br>Commodity: Sand and Gravel<br>Positional Accuracy: Located by supplier to within 10m | A18NW (N) | 254 | 1 | 581007 313271 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 28 | **BGS Recorded Mineral Sites**<br>Site Name: Bartholomew'S Hills Pit<br>Location: South Acre, King'S Lynn, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194422<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A19SW (NE) | 258 | 1 | 581631 312948 |
| 29 | **BGS Recorded Mineral Sites**<br>Site Name: Bartholomew'S Hills Pit<br>Location: South Acre, King'S Lynn, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194389<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A19NW (NE) | 325 | 1 | 581609 313249 |
| 30 | **BGS Recorded Mineral Sites**<br>Site Name: Swaffham Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194435<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A8NE (S) | 330 | 1 | 581179 311907 |
| 31 | **BGS Recorded Mineral Sites**<br>Site Name: Swaffham Plashes Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 195395<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A9NW (SE) | 522 | 1 | 581649 311785 |
| 32 | **BGS Recorded Mineral Sites**<br>Site Name: South Acre Pit<br>Location: South Acre, King'S Lynn, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194416<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A17SE (NW) | 549 | 1 | 580506 312844 |
| 33 | **BGS Recorded Mineral Sites**<br>Site Name: Fincham Drove Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194417<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A12SW (W) | 585 | 1 | 580366 312227 |

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|---|---|---|---|---|---|
| 34 | **BGS Recorded Mineral Sites**<br>Site Name: Fincham Drove Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194432<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A12SW (W) | 596 | 1 | 580403 312016 |
| 35 | **BGS Recorded Mineral Sites**<br>Site Name: Bartholomew'S Hills Gravel Pit<br>Location: South Acre, King'S Lynn, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194425<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Quaternary<br>Geology: Lowestoft Formation<br>Commodity: Sand and Gravel<br>Positional Accuracy: Located by supplier to within 10m | A19NE (NE) | 617 | 1 | 581990 313004 |
| 36 | **BGS Recorded Mineral Sites**<br>Site Name: Swaffham Plashes Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 195393<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A8SW (S) | 648 | 1 | 581059 311596 |
| 37 | **BGS Recorded Mineral Sites**<br>Site Name: Swaffham Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194428<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A14SE (E) | 688 | 1 | 582045 312095 |
| 38 | **BGS Recorded Mineral Sites**<br>Site Name: Swaffham Plashes Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 195396<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A9NE (SE) | 768 | 1 | 581966 311741 |
| 39 | **BGS Recorded Mineral Sites**<br>Site Name: Round Covert Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 195388<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A7NW (SW) | 769 | 1 | 580454 311665 |

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| 40 | **BGS Recorded Mineral Sites**<br>Site Name: Bartholomew'S Hills Gravel Pit<br>Location: South Acre, King'S Lynn, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194423<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Quaternary<br>Geology: Lowestoft Formation<br>Commodity: Sand and Gravel<br>Positional Accuracy: Located by supplier to within 10m | A20SW (NE) | 816 | 1 | 582189 312907 |
| 41 | **BGS Recorded Mineral Sites**<br>Site Name: Forty Acre Pit<br>Location: South Acre, King'S Lynn, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194415<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A16SE (W) | 915 | 1 | 580067 312655 |
| 42 | **BGS Recorded Mineral Sites**<br>Site Name: Bartholomew'S Hills Gravel Pit<br>Location: South Acre, King'S Lynn, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194424<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Quaternary<br>Geology: Lowestoft Formation<br>Commodity: Sand and Gravel<br>Positional Accuracy: Located by supplier to within 10m | A20SW (NE) | 931 | 1 | 582304 312875 |
| 43 | **BGS Recorded Mineral Sites**<br>Site Name: Swaffham Plashes Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 195394<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A3NE (S) | 971 | 1 | 581400 311255 |
| 44 | **BGS Recorded Mineral Sites**<br>Site Name: Swaffham Pit<br>Location: Swaffham, Norfolk<br>Source: British Geological Survey, National Geoscience Information Service<br>Reference: 194429<br>Type: Opencast<br>**Status: Ceased**<br>Operator: Unknown Operator<br>Operator Location: Not Supplied<br>Periodic Type: Cretaceous<br>Geology: White Chalk Subgroup<br>Commodity: Chalk<br>Positional Accuracy: Located by supplier to within 10m | A15SW (E) | 986 | 1 | 582338 312039 |
| | **BGS Measured Urban Soil Chemistry**<br>No data available | | | | |
| | **BGS Urban Soil Chemistry Averages**<br>No data available | | | | |
| | **Coal Mining Affected Areas**<br>In an area that might not be affected by coal mining | | | | |
| | **Mining Instability**<br>Mining Evidence: Conclusive Rock Mining<br>Source: Ove Arup & Partners<br>Boundary Quality: As Supplied | A18NE (N) | 0 | 6 | 581184 313000 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Man-Made Mining Cavities**<br>Easting: 581000<br>Northing: 313000<br>Distance: 71<br>Quadrant Reference: A18<br>Quadrant Reference: NW<br>Bearing Ref: N<br>Cavity Type: Chalk Mine-Details Unknown<br>Commodity: Chalk<br>Solid Geology Detail: No Details<br>Superficial Geology Detail: Glacial Sand and Gravel, Glacial Till | A18NW (N) | 71 | 6 | 581000 313000 |
| | **Non Coal Mining Areas of Great Britain**<br>Risk: Rare<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (S) | 0 | 1 | 581184 312335 |
| | **Potential for Collapsible Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (S) | 0 | 1 | 581184 312335 |
| | **Potential for Compressible Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (S) | 0 | 1 | 581184 312335 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (S) | 0 | 1 | 581184 312335 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 1 | 581028 312344 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A18NE (N) | 58 | 1 | 581294 313085 |
| | **Potential for Ground Dissolution Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A18NW (N) | 95 | 1 | 581160 313120 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (S) | 0 | 1 | 581184 312335 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 1 | 581028 312344 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 37 | 1 | 580914 312328 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service | A18NE (N) | 58 | 1 | 581294 313085 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service | A18NW (N) | 95 | 1 | 581160 313120 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: Moderate<br>Source: British Geological Survey, National Geoscience Information Service | A18NW (N) | 113 | 1 | 581113 313138 |
| | **Potential for Landslide Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A18NE (N) | 162 | 1 | 581406 313184 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (S) | 0 | 1 | 581184 312335 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: Very Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 1 | 581028 312344 |
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 37 | 1 | 580914 312328 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| | **Potential for Running Sand Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A18NE (N) | 162 | 1 | 581406 313184 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (S) | 0 | 1 | 581184 312335 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: Low<br>Source: British Geological Survey, National Geoscience Information Service | A13NW (W) | 0 | 1 | 581028 312344 |
| | **Potential for Shrinking or Swelling Clay Ground Stability Hazards**<br>Hazard Potential: No Hazard<br>Source: British Geological Survey, National Geoscience Information Service | A18NE (N) | 62 | 1 | 581225 313089 |
| | **Radon Potential - Radon Affected Areas**<br>Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level).<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (S) | 0 | 1 | 581184 312335 |
| | **Radon Potential - Radon Protection Measures**<br>Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions<br>Source: British Geological Survey, National Geoscience Information Service | A13NE (S) | 0 | 1 | 581184 312335 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 45 | **Points of Interest - Manufacturing and Production**<br>Name: Tank<br>Location: PE32<br>Category: Industrial Features<br>Class Code: Tanks (Generic)<br>Positional Accuracy: Positioned to address or location | A13NW (NW) | 97 | 7 | 580879 312546 |
| 45 | **Points of Interest - Manufacturing and Production**<br>Name: Tanks<br>Location: PE32<br>Category: Industrial Features<br>Class Code: Tanks (Generic)<br>Positional Accuracy: Positioned to an adjacent address or location | A13NW (NW) | 100 | 7 | 580878 312553 |
| 45 | **Points of Interest - Manufacturing and Production**<br>Name: Tank<br>Location: PE32<br>Category: Industrial Features<br>Class Code: Tanks (Generic)<br>Positional Accuracy: Positioned to address or location | A13NW (NW) | 114 | 7 | 580859 312536 |
| 45 | **Points of Interest - Manufacturing and Production**<br>Name: Tank<br>Location: PE32<br>Category: Industrial Features<br>Class Code: Tanks (Generic)<br>Positional Accuracy: Positioned to address or location | A13NW (NW) | 118 | 7 | 580855 312534 |
| 45 | **Points of Interest - Manufacturing and Production**<br>Name: Tanks<br>Location: PE32<br>Category: Industrial Features<br>Class Code: Tanks (Generic)<br>Positional Accuracy: Positioned to an adjacent address or location | A13NW (NW) | 118 | 7 | 580855 312538 |
| 46 | **Points of Interest - Manufacturing and Production**<br>Name: Workings (Dis)<br>Location: PE32<br>Category: Extractive Industries<br>Class Code: Unspecified Quarries Or Mines<br>Positional Accuracy: Positioned to an adjacent address or location | A16SE (W) | 930 | 7 | 580054 312670 |

| Map ID | Details | Quadrant Reference (Compass Direction) | Estimated Distance From Site | Contact | NGR |
|---|---|---|---|---|---|
| 47 | **Nitrate Vulnerable Zones**<br>Name: Anglian Chalk<br>Description: Groundwater<br>Source: Environment Agency, Head Office | A13NE (S) | 0 | 2 | 581184 312335 |
| 48 | **Nitrate Vulnerable Zones**<br>Name: Nar Upstream Of Abbey Farm Nvz<br>Description: Surface Water<br>Source: Environment Agency, Head Office | A13NE (S) | 0 | 2 | 581184 312335 |
| 49 | **Nitrate Vulnerable Zones**<br>Name: Ely Ouse And Cut-Off Channel Nvz<br>Description: Surface Water<br>Source: Environment Agency, Head Office | A8NW (S) | 589 | 2 | 580912 311665 |

| Agency & Hydrological | Version | Update Cycle |
|---|---|---|
| **Contaminated Land Register Entries and Notices** | | |
| Breckland District Council - Environmental Health Department | July 2025 | Annual Rolling Update |
| Environment Agency - Head Office | November 2023 | Annually |
| **Discharge Consents** | | |
| Environment Agency - Anglian Region | July 2025 | Quarterly |
| **Enforcement and Prohibition Notices** | | |
| Environment Agency - Anglian Region | March 2013 | |
| **Integrated Pollution Controls** | | |
| Environment Agency - Anglian Region | January 2009 | |
| **Integrated Pollution Prevention And Control** | | |
| Environment Agency - Anglian Region | October 2024 | Bi-Annually |
| **Local Authority Integrated Pollution Prevention And Control** | | |
| Breckland District Council - Environmental Health Department | December 2024 | Variable |
| **Local Authority Pollution Prevention and Controls** | | |
| Breckland District Council - Environmental Health Department | December 2024 | Not Applicable |
| **Local Authority Pollution Prevention and Control Enforcements** | | |
| Breckland District Council - Environmental Health Department | December 2024 | Variable |
| **Nearest Surface Water Feature** | | |
| Ordnance Survey | September 2025 | |
| **Pollution Incidents to Controlled Waters** | | |
| Environment Agency - Anglian Region | September 1999 | |
| **Historical Prosecutions** | | |
| Environment Agency, Anglian Region | March 2013 | Not Applicable |
| **Registered Radioactive Substances** | | |
| Environment Agency - Anglian Region | May 2023 | |
| Environment Agency - Head Office | May 2023 | |
| **Substantiated Pollution Incident Register** | | |
| Environment Agency - Anglian Region - Central Area | July 2025 | Quarterly |
| **Water Abstractions** | | |
| Environment Agency - Anglian Region | July 2025 | Quarterly |
| **Water Industry Act Referrals** | | |
| Environment Agency - Anglian Region | October 2017 | |
| **Groundwater Vulnerability Map** | | |
| Environment Agency - Head Office | June 2018 | As notified |
| **Groundwater Vulnerability - Soluble Rock Risk** | | |
| Environment Agency - Head Office | June 2018 | As notified |
| **Bedrock Aquifer Designations** | | |
| Environment Agency - Head Office | January 2018 | As notified |
| **Superficial Aquifer Designations** | | |
| Environment Agency - Head Office | January 2018 | As notified |
| **Source Protection Zones** | | |
| Environment Agency - Head Office | August 2025 | Bi-Annually |
| **Extreme Flooding from Rivers or Sea without Defences** | | |
| Environment Agency - Head Office | December 2023 | As notified |
| **Flooding from Rivers or Sea without Defences** | | |
| Environment Agency - Head Office | December 2023 | As notified |
| **Areas Benefiting from Flood Defences** | | |
| Environment Agency - Head Office | February 2023 | |
| **Flood Water Storage Areas** | | |
| Environment Agency - Head Office | June 2025 | Quarterly |

| Agency & Hydrological | Version | Update Cycle |
|---|---|---|
| **Flood Defences**<br>Environment Agency - Head Office | August 2022 | |
| **OS Water Network Lines**<br>Ordnance Survey | October 2025 | Quarterly |
| **Surface Water 1 in 30 year Flood Extent**<br>Environment Agency - Head Office | May 2018 | Annually |
| **Surface Water 1 in 100 year Flood Extent**<br>Environment Agency - Head Office | May 2018 | Annually |
| **Surface Water 1 in 1000 year Flood Extent**<br>Environment Agency - Head Office | May 2018 | Annually |
| **Surface Water Suitability**<br>Environment Agency - Head Office | February 2016 | Annually |
| **BGS Groundwater Flooding Susceptibility**<br>British Geological Survey - National Geoscience Information Service | May 2013 | As notified |
| **Water Framework Directive - Catchment**<br>Environment Agency - Head Office | July 2025 | Annually |
| **Water Framework Directive - Groundwater**<br>Environment Agency - Head Office | July 2025 | Annually |
| **Waste** | **Version** | **Update Cycle** |
| **BGS Recorded Landfill Sites**<br>British Geological Survey - National Geoscience Information Service | November 2002 | As notified |
| **Historical Landfill Sites**<br>Environment Agency - Head Office | April 2025 | Bi-Annually |
| **Integrated Pollution Control Registered Waste Sites**<br>Environment Agency - Anglian Region | January 2009 | Not Applicable |
| **Licensed Waste Management Facilities (Landfill Boundaries)**<br>Environment Agency - Anglian Region - Central Area | July 2025 | Quarterly |
| **Licensed Waste Management Facilities (Locations)**<br>Environment Agency - Anglian Region - Central Area | April 2025 | Bi-Annually |
| **Local Authority Landfill Coverage**<br>Breckland District Council - Environmental Health Department<br>Norfolk County Council - Planning & Transportation - Minerals & Waste | February 2003<br>February 2003 | Not Applicable<br>Not Applicable |
| **Local Authority Recorded Landfill Sites**<br>Breckland District Council - Environmental Health Department<br>Norfolk County Council - Planning & Transportation - Minerals & Waste | October 2018<br>October 2018 | |
| **Potentially Infilled Land (Non-Water)**<br>Landmark Information Group Limited | December 1999 | |
| **Potentially Infilled Land (Water)**<br>Landmark Information Group Limited | December 1999 | |
| **Registered Landfill Sites**<br>Environment Agency - Anglian Region - Central Area | March 2006 | Not Applicable |
| **Registered Waste Transfer Sites**<br>Environment Agency - Anglian Region - Central Area | April 2018 | |
| **Registered Waste Treatment or Disposal Sites**<br>Environment Agency - Anglian Region - Central Area | June 2015 | |

| Hazardous Substances | Version | Update Cycle |
|---|---|---|
| **Control of Major Accident Hazards Sites (COMAH)** | | |
| Health and Safety Executive | June 2025 | Bi-Annually |
| **Explosive Sites** | | |
| Health and Safety Executive | March 2017 | |
| **Notification of Installations Handling Hazardous Substances (NIHHS)** | | |
| Health and Safety Executive | August 2001 | |
| **Planning Hazardous Substance Enforcements** | | |
| Norfolk County Council - Planning & Transportation - Minerals & Waste | June 2007 | Annual Rolling Update |
| Breckland District Council - Health and Housing | March 2023 | Variable |
| **Planning Hazardous Substance Consents** | | |
| Breckland District Council - Health and Housing | July 2022 | Variable |
| Norfolk County Council - Planning & Transportation - Minerals & Waste | June 2007 | Annual Rolling Update |

| Geological | Version | Update Cycle |
|---|---|---|
| **BGS 1:625,000 Solid Geology** | | |
| British Geological Survey - National Geoscience Information Service | January 2009 | As notified |
| **BGS Estimated Soil Chemistry** | | |
| British Geological Survey - National Geoscience Information Service | December 2015 | As notified |
| **BGS Recorded Mineral Sites** | | |
| British Geological Survey - National Geoscience Information Service | April 2025 | Bi-Annually |
| **CBSCB Compensation District** | | |
| Cheshire Brine Subsidence Compensation Board (CBSCB) | August 2011 | |
| Cheshire Brine Subsidence Compensation Board (CBSCB) | November 2020 | As notified |
| **Coal Mining Affected Areas** | | |
| The Coal Authority - Property Searches | February 2023 | |
| **Mining Instability** | | |
| Ove Arup & Partners | June 1998 | Not Applicable |
| **Non Coal Mining Areas of Great Britain** | | |
| British Geological Survey - National Geoscience Information Service | May 2015 | Not Applicable |
| **Potential for Collapsible Ground Stability Hazards** | | |
| British Geological Survey - National Geoscience Information Service | April 2020 | As notified |
| **Potential for Compressible Ground Stability Hazards** | | |
| British Geological Survey - National Geoscience Information Service | January 2019 | As notified |
| **Potential for Ground Dissolution Stability Hazards** | | |
| British Geological Survey - National Geoscience Information Service | January 2019 | As notified |
| **Potential for Landslide Ground Stability Hazards** | | |
| British Geological Survey - National Geoscience Information Service | January 2019 | As notified |
| **Potential for Running Sand Ground Stability Hazards** | | |
| British Geological Survey - National Geoscience Information Service | January 2019 | As notified |
| **Potential for Shrinking or Swelling Clay Ground Stability Hazards** | | |
| British Geological Survey - National Geoscience Information Service | January 2019 | As notified |
| **Radon Potential - Radon Affected Areas** | | |
| British Geological Survey - National Geoscience Information Service | November 2024 | Annually |
| **Radon Potential - Radon Protection Measures** | | |
| British Geological Survey - National Geoscience Information Service | November 2024 | Annually |

# Data Currency

| Industrial Land Use | Version | Update Cycle |
|---|---|---|
| **Contemporary Trade Directory Entries**<br>Thomson Directories | September 2025 | Quarterly |
| **Fuel Station Entries**<br>Green Street Advisor (UK) Ltd | August 2025 | Quarterly |
| **Points of Interest - Commercial Services**<br>PointX | September 2025 | Quarterly |
| **Points of Interest - Education and Health**<br>PointX | September 2025 | Quarterly |
| **Points of Interest - Manufacturing and Production**<br>PointX | September 2025 | Quarterly |
| **Points of Interest - Public Infrastructure**<br>PointX | September 2025 | Quarterly |
| **Points of Interest - Recreational and Environmental**<br>PointX | September 2025 | Quarterly |
| **Underground Electrical Cables**<br>National Grid | January 2024 | |

| Sensitive Land Use | Version | Update Cycle |
|---|---|---|
| **Ancient Woodland**<br>Natural England | September 2025 | Bi-Annually |
| **Areas of Adopted Green Belt**<br>Breckland District Council | July 2025 | Quarterly |
| **Areas of Unadopted Green Belt**<br>Breckland District Council | July 2025 | Quarterly |
| **Areas of Outstanding Natural Beauty**<br>Natural England | November 2025 | Bi-Annually |
| **Environmentally Sensitive Areas**<br>Natural England | August 2023 | |
| **Forest Parks**<br>Forestry Commission | May 2023 | Not Applicable |
| **Local Nature Reserves**<br>Natural England | August 2025 | Bi-Annually |
| **Marine Nature Reserves**<br>Natural England | August 2025 | Bi-Annually |
| **National Nature Reserves**<br>Natural England | July 2025 | Bi-Annually |
| **National Parks**<br>Natural England | September 2025 | Annually |
| **Nitrate Sensitive Areas**<br>Natural England | April 2023 | Not Applicable |
| **Nitrate Vulnerable Zones**<br>Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)<br>Environment Agency - Head Office | April 2016<br>November 2024 | Annually |
| **Ramsar Sites**<br>Natural England | August 2025 | Bi-Annually |
| **Sites of Special Scientific Interest**<br>Natural England | May 2025 | Bi-Annually |
| **Special Areas of Conservation**<br>Natural England | July 2025 | Bi-Annually |
| **Special Protection Areas**<br>Natural England | May 2025 | Bi-Annually |

# Data Suppliers

A selection of organisations who provide data within this report

| Data Supplier | Data Supplier Logo |
|---|---|
| **Ordnance Survey** | Map data |
| **Environment Agency** | Environment Agency |
| **Scottish Environment Protection Agency** | SEPA Scottish Environment Protection Agency |
| **The Coal Authority** | The Coal Authority |
| **British Geological Survey** | British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL |
| **Centre for Ecology and Hydrology** | Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL |
| **Natural Resources Wales** | Cyfoeth Naturiol Cymru Natural Resources Wales |
| **Scottish Natural Heritage** | SCOTTISH NATURAL HERITAGE |
| **Natural England** | NATURAL ENGLAND |
| **Public Health England** | Public Health England |
| **Ove Arup** | ARUP |
| **Stantec UK Ltd** | Stantec |

# Useful Contacts

| Contact | Name and Address | Contact Details |
|---|---|---|
| 1 | **British Geological Survey - Enquiry Service**<br>British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG | Telephone: 0115 936 3143<br>Fax: 0115 936 3276<br>Email: enquiries@bgs.ac.uk<br>Website: www.bgs.ac.uk |
| 2 | **Environment Agency - National Customer Contact Centre (NCCC)**<br>PO Box 544, Templeborough, Rotherham, S60 1BY | Telephone: 03708 506 506<br>Email: enquiries@environment-agency.gov.uk |
| 3 | **Ordnance Survey**<br>Adanac Drive, Southampton, Hampshire, SO16 0AS | Telephone: 03456 05 05 05<br>Email: customerservices@ordnancesurvey.co.uk<br>Website: www.ordnancesurvey.co.uk |
| 4 | **Norfolk County Council - Planning & Transportation - Minerals & Waste**<br>County Hall, Martineau Lane, Norwich, Norfolk, NR1 2DH | Telephone: 0844 800 8020<br>Fax: 0844 800 8012<br>Email: information@norfolk.gov.uk<br>Website: www.norfolk.gov.uk |
| 5 | **Breckland District Council - Environmental Health Department**<br>Elizabeth House, Walpole Loke, Dereham, Norfolk, NR19 1EE | Telephone: 01362 656350<br>Fax: 01362 656266<br>Website: www.breckland.gov.uk |
| 6 | **Landmark Information Group Limited**<br>Landmark Information Group, Imperium, Imperial Way, Reading, Berkshire, RG2 0TD | Telephone: 0330 036 6619<br>Fax: 0844 844 9951<br>Email: helpdesk@landmark.co.uk<br>Website: www.landmark.co.uk |
| 7 | **PointX**<br>5-6 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY | Website: www.pointx.co.uk |
| 8 | **Natural England**<br>County Hall, Spetchley Road, Worcester, WR5 2NP | Telephone: 0300 060 3900<br>Email: enquiries@naturalengland.org.uk<br>Website: www.naturalengland.org.uk |
| - | **Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards**<br>Chilton, Didcot, Oxfordshire, OX11 0RQ | Telephone: 01235 822622<br>Fax: 01235 833891<br>Email: radon@phe.gov.uk<br>Website: www.ukradon.org |
| - | **Landmark Information Group Limited**<br>Landmark Information Group, Imperium, Imperial Way, Reading, Berkshire, RG2 0TD | Telephone: 0330 036 6618<br>Fax: 0844 844 9951<br>Email: helpdesk@landmark.co.uk<br>Website: www.landmark.co.uk |

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.

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