West Burton Solar Project

Environmental Statement

Appendix 10.3: Flood Risk Assessment and Drainage Strategy – West Burton 1

Prepared by: Delta-Simons

March 2023

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APFP Regulation 5(2)(e)

West Burton
SOLAR PROJECT

Flood Risk Assessment and Drainage Strategy

Appendix B - West Burton 1

Presented to: West Burton Solar Project

Issued: March 2023

Delta-Simons Project No: 22-1098.03

Protecting people and planet

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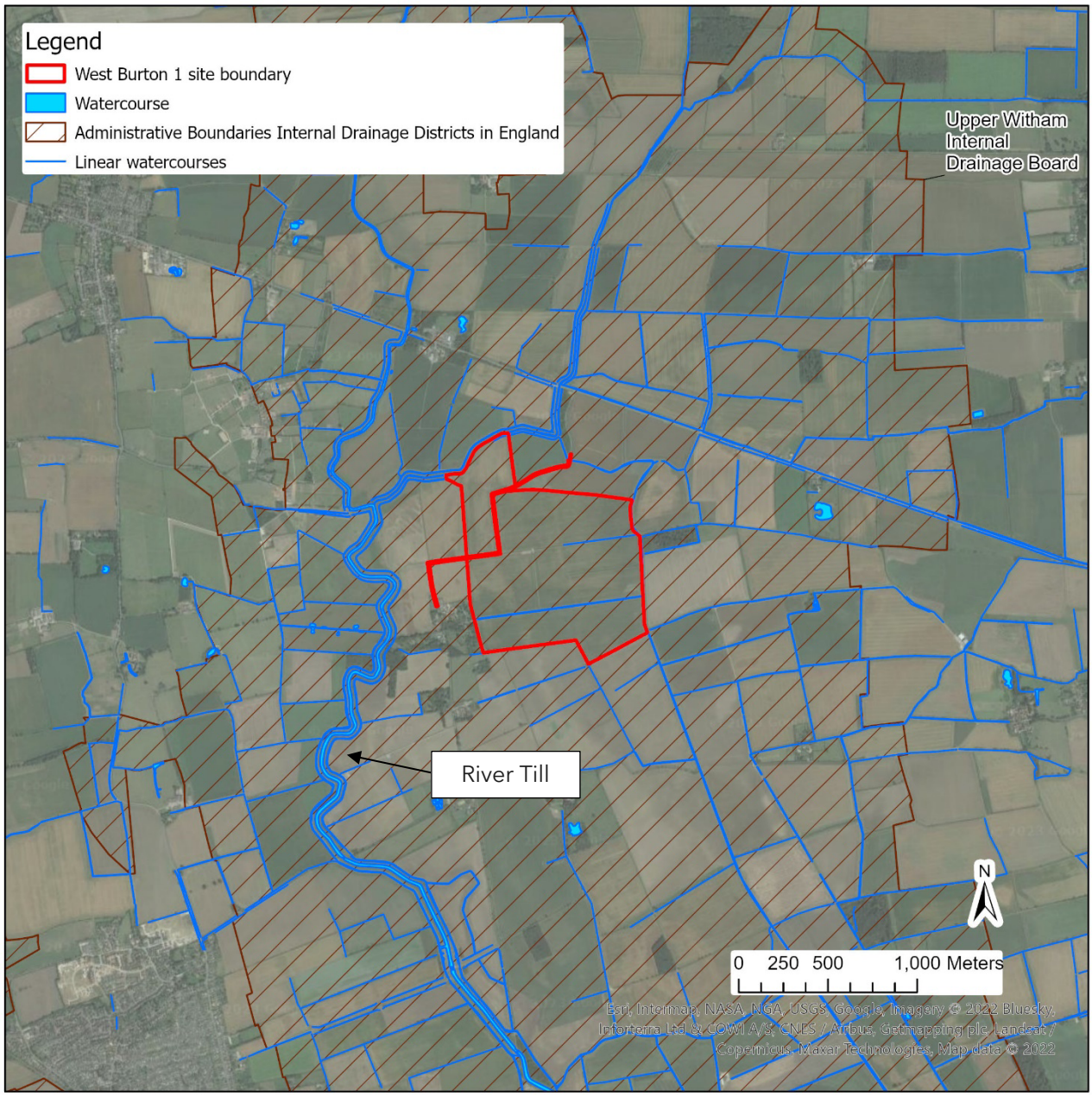
Annexes

1.0 Site Description

1.1.1 The term "Site" has been used in reference to the land parcels which make up the overall Scheme. For further details of the Scheme, please see Chapter 4 of the Environmental Statement (ES): Scheme Description [EN010132/APP/WB6.2.4].

1.1.2 The aim of this section of the report is to outline key environmental information associated with the baseline environment.



Site Location Plan	
Co-ordinates	Centred approximately at National Grid Reference (NGR) 491186, 378515

Site Location	The Site is located within a rural setting and comprises multiple parcels of agricultural fields. The Site is also approximately 2.2 km northeast of the village of Saxilby.
Existing Site Conditions	Online mapping (including Google Maps / Google Streetview imagery, accessed May 2022) shows that the Site is greenfield comprising agricultural / arable fields. The Site is bordered by a tributary of the River Till along the north-western boundary, with greenfield land lying beyond from all orientations. The bordering tributary joins the River Till approximately 430 m west of the Site. Access to the Site is provided from the A1500 to the north.
Topography	Topographic levels to metres Above Ordnance Datum (m AOD) have been derived from a 1 m resolution Environment Agency (EA) composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). A review of LiDAR ground elevation data shows that the Site slopes from approximately 8 m AOD in the west to 7 m AOD in the north, 5 m AOD in the east and 4 m AOD in the south. Given the size of the Site the gradients are shallow and the Site is relatively flat. A LiDAR extract is included in Annex A.
Hydrology	The nearest watercourse is a tributary of the River Till, which is located adjacent to the north-western border of the Site. The watercourse flows in a south-easterly direction and joins the River Till approximately 430 m west. The tributary of the River Till and the River Till are both Main Rivers and the responsibility of the EA to maintain. There are also land drains located through the central areas of the Site and to the Site's northern, eastern and southern periphery. The Site is located within the Upper Witham Internal Drainage Board (IDB).
Water Framework Directive Status	The Site is located across the Skellingthorpe Main Drain and River Till Water Body Catchments. A summary of the Water Body Classification for the catchments are included as Annexes B and C.
Geology	Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the north-western extents of the Site are underlain by superficial deposits of alluvium, generally comprising clay, silt, sand and gravel. The eastern and central extents of the Site are underlain by superficial deposits of Till (Mid Pleistocene) comprising of Diamicton. The western extents of the Site are not underlain by any superficial deposits. The Site is identified as being underlain by Charmouth Mudstone Formation Bedrock, consisting of Mudstone. The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a Site-specific basis. The BGS borehole record (BGS Ref: SK97NW9/G) is located within the northern boundary of the Site (NGR 490900,378820). The borehole record indicates the following geology at the Site: • Brown clay (3.05 m below ground level (bgl)); and

	• Blue clay (12.19 m bgl)
Hydrogeology	According to the EA's Aquifer Designation data, obtained from MAGIC Map's online mapping [accessed 07/02/23], the Alluvium superficial deposits are classified as a Secondary A Aquifer and the Till is classified as a Secondary (undifferentiated) Aquifer). The Charmouth Mudstone Formation Bedrock was also identified as a Secondary (undifferentiated) Aquifer. Secondary A Aquifers are 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers;' Secondary Undifferentiated Aquifers are assigned in 'cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type'. The EA's 'Source Protection Zones' data, obtained from MAGIC Map's online mapping, indicates that the Site is not located within a Groundwater Source Protection Zone.
Proposed Site Conditions	The proposed development for the Site is for a ground mounted solar photo-voltaic plant and associated conversion units, substation and access roads. An Illustrative Layout Plan is included as Annex D.

2.0 Assessment of Flood Risk

2.1 Tidal Flood Risk

2.1.1 The Site is situated approximately 50 km inland at a minimum elevation of 4 m AOD. Therefore, the risk from tidal flooding is considered to be **Negligible.**

2.2 Fluvial Flood Risk

EA Online Flood Maps

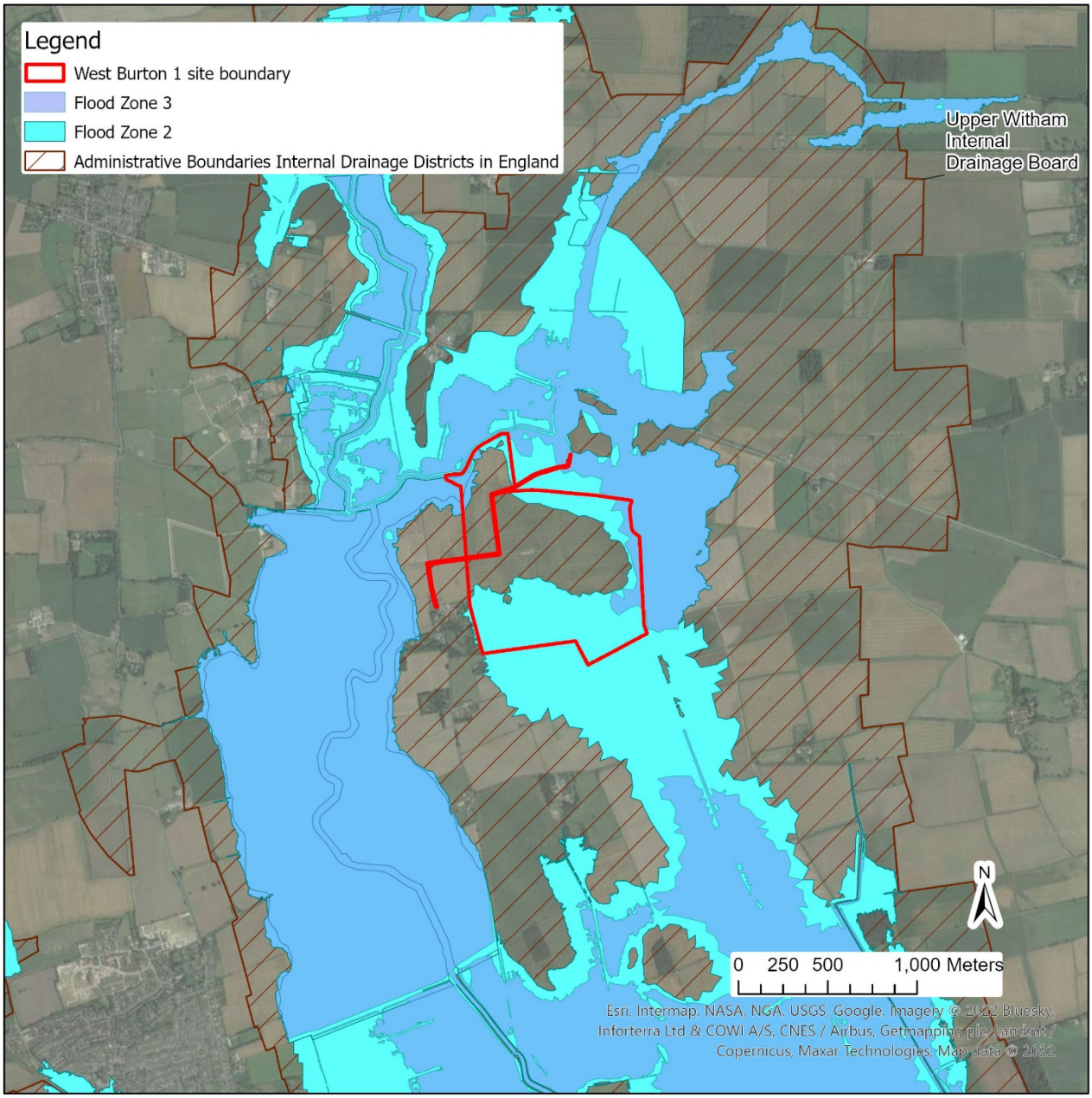


Figure 1: EA Flood Map for Planning

2.2.1 The EA's Flood Risk Map for Planning (Figure 1) indicates that the northern and eastern Site boundaries are slightly encroached by Flood Zone 3. The Site is also partly located within Flood Zone 2 in the north-east and south. Flood Zone 3 (High Probability) is defined as having a 1 in 100 or greater annual probability of fluvial flooding, whereas Flood Zone 2 (Medium Probability) is defined as having between a 1 in 100 and 1 in 1000 annual probability of fluvial flooding. Fluvial risk to the Site is associated with the River Till.

2.2.2 The Site is partially located within a Flood Warning Area and Flood Alert Area.

2.2.3 The EA's Historic Flood Map (Annex F) indicates that the majority of the Site has previously flooded. However, the data shows that the previous flood event occurred in February 1795. As described in paragraph 2.2.4 below, flood defences have been constructed along the River Till since this event occurred, and there have been no significant flooding events at the Site since. A very minor portion of the north-west of the Site was impacted by a flood event in November 2000, however this extent matches that of the River Till flood storage reservoir.

Flood Defences

2.2.4 The EA's Spatial Flood Defences Dataset indicates that there are embankments present within the vicinity of the Site, surrounding the River Till. The embankments have an upstream crest level of 7.13 m AOD and a downstream crest level of 7 m AOD. The Standard of Protection (SoP) of the embankments is 1 in 100 years.

EA Product Data / Consultation

2.2.5 The north-western corner of the Site lies within the River Till storage reservoir. During a consultation meeting with the EA on 03/09/21, the EA representative stated that the reservoir acts as a bowl storage area, holding water to a level of 6.65 m AOD, which results in depths of ~ 2 m throughout the reservoir when full. The Illustrative Masterplan included in Annex D indicates that no development will occur within this portion of the Site.

2.2.6 Site-specific flood data and information has been obtained from the EA in February 2022. An accompanying consultation response is included in Annex E. Within their response the EA have stated the following pertaining to West Burton 1:

"The Map below is from the latest model, which is the Upper Witham Lincoln 2015 model. This model is due to be updated over the next year, and whilst no significant changes are expected at this location we will be able to provide a clearer picture on the flood extents, depths, etc"

"You can see from the map the eastern border [of West Burton 1] you highlighted in your email is now in flood zone 1, though as there are drains along the border some flooding would still be possible it is just not picked up in our modelling. Any such flooding is likely to be relatively shallow, ie less than 0.5 m."

"The depths to the southern boundary are generally less than 0.5 m thought there is a line of deeper flooding, though this appears to be along the line of a drain, so it is possible the lidar used for the 2D model at this location has picked up lower levels in this drain".

2.2.7 The EA also made available modelled fluvial depth mapping for the River Till. The flood model is derived from the Upper Witham Lincoln 2015 model.

2.2.8 The Site is considered to be 'Essential Infrastructure' within the Witham Catchment of the Anglian River Basin District and therefore the higher central Climate Change (CC) allowance of 15% for the 2050s epoch should be utilised. The operational life of the Scheme will not exceed 40 years and therefore, the 2050s epoch allowance is considered to be appropriate. Please see Section 2.6 of the Covering Report [EN010132/APP/WB6.3.10.1] for further detail on EA CC terminology.

2.2.9 The modelled depth information provided by the EA only included a 20% allowance and therefore depicts a worse-case scenario.

2.2.10 During the 1% AEP + 20% CC scenario (Annex G), the vast majority of the Site is shown to remain flood free with only a minor portion of the north-western boundary shown to be flooded between depths of 0.1 m to 0.9 m. This area is located within and around the periphery of the Till Flood Storage Area.

2.2.11 During the 0.1% AEP + 20% CC scenario (Annex H), the majority of the Site is shown to remain flood-free. Minor extents of flooding with depths between 0.1 – 0.4 m is shown to encroach the Site in the north and north-east. Deeper flooding (depths > 0.5 m) is shown along the drainage channel which runs adjacent to the eastern Site boundary but is contained within the channel. The north-western corner of the Site is also indicated to flood to depths greater than 1 m however as stated above, this area is utilised as a flood storage area so no development should be situated within it.

2.2.12 It should be noted that on the basis that the Site's operational phase will not exceed 40 years, the 0.1% AEP (1 in 1000 year) + 20% CC event is extremely unlikely to occur within this time period and is considered a residual risk.

Summary

2.2.13 Based on the evidence above the vast majority of the Site remains flood free during the 1% AEP + 20% CC event with only minor flooding within the Till Flood Storage Area in the north-west of the Site. The proposed solar panels will be raised above surrounding ground levels with associated power infrastructure appropriately waterproofed. Embedded mitigation measures are considered in 3.2 of the covering report [EN010132/APP/WB6.3.10.1] and in section 2.7 of this appendix.

2.2.14 It can therefore be concluded that the Site is at **Low** risk of fluvial flooding, therefore no specific mitigation is considered necessary.

2.3 Surface Water Flood Risk

2.3.1 The EA's Long-Term Flood Risk Map (Figure 2) indicates that the surface water risk across the Site is predominately Very Low (<0.1% Annual Probability). Surface Water flooding with a High Risk (>3.3% Annual Probability) of occurrence is present within topographic depressions, along the northeast boundary, the southeast boundary and in the central section of the Site.

2.3.2 The Medium risk flow path in the west is associated with a land surface drain that runs through the Site, flowing north towards the River Till.

2.3.3 Flood depths are expected to remain below 300 mm during the High and Medium Risk scenarios in all areas excluding the land drains within the Site, which is expected to reach depths between 300 and 900 mm likely due to the watercourse being topographically lower than the surrounding Site.

2.3.4 According to Figure 2, there are no distinct flow routes in the area which would direct any potential surface water flooding towards the Site. Flow routes that are associated with the Site direct potential surface flooding south-east and east, away from the Site following the sloping topography. Any shallow depth surface water flooding is predicted to drain naturally into the surrounding land drainage ditch.

2.3.5 There is no indication within relevant third party reports to suggest that the Site has historically experienced surface water flooding.

2.3.6 Based on the above and considering the inherent design of the solar panels, the overall risk of surface water flooding is considered to be **Low.** The proposed solar panels will be raised above surrounding ground levels and will be appropriately waterproofed thereby reducing the potential to be impacted in the event of surface water flooding.

2.3.7 The impact of the development on surface water risk is covered in Section 5.0 of the Covering Report to ensure that surface water risk is not exacerbated through appropriate SuDS measures.

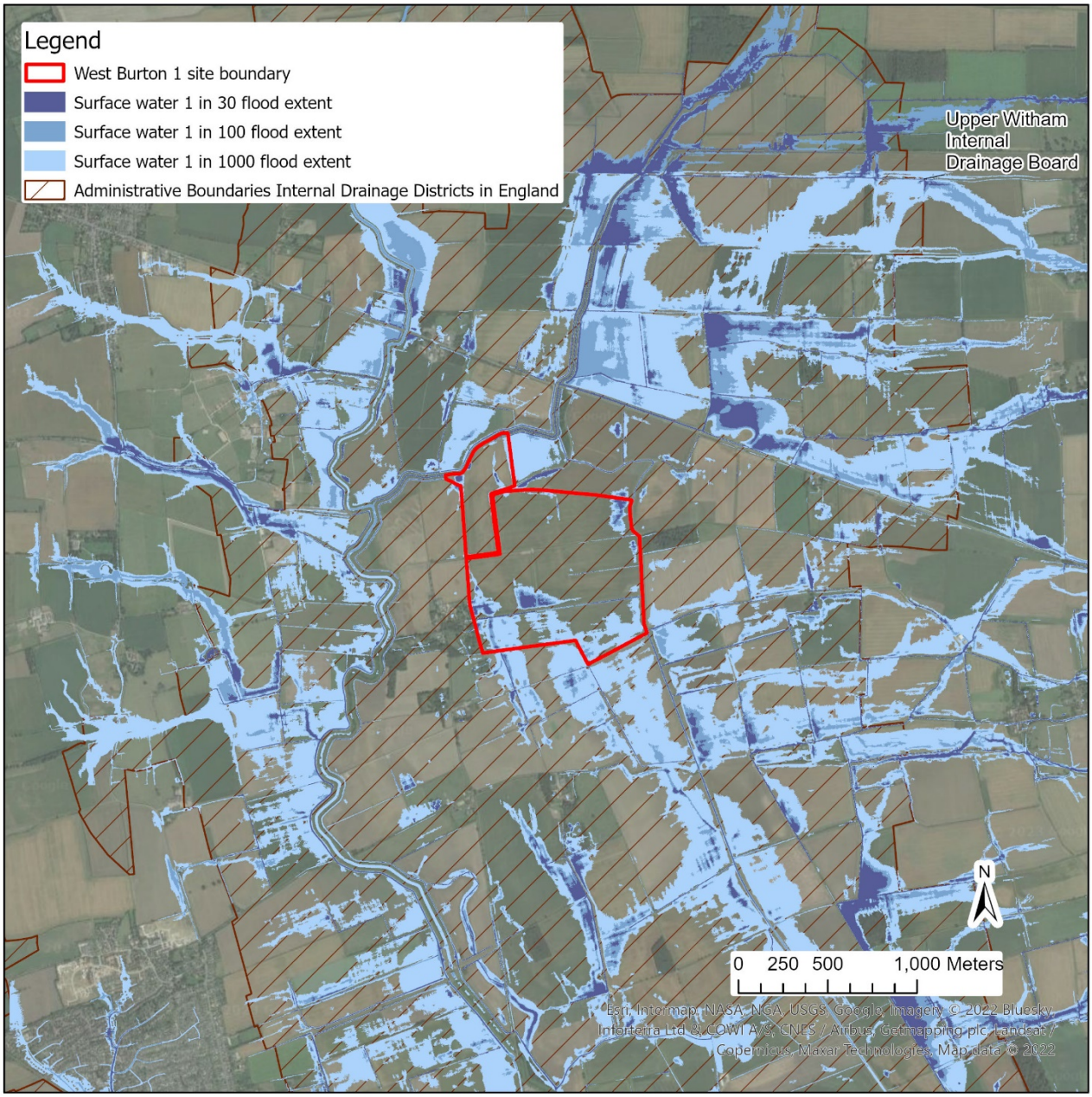


Figure 2: EA's Long Term Flood Risk Map (Surface Water)

2.4 Groundwater Flood Risk

2.4.1 There is no information within relevant third party reports to suggest that the Site has experienced historical groundwater flooding.

2.4.2 No buildings other than the supporting unstaffed infrastructure and no basement levels are identified on plans which may otherwise be at increased risk from groundwater seepage.

2.4.3 It can therefore be concluded that the risk of groundwater flooding is **Low** and no specific mitigation measures are required.

2.5 Artificial Sources Flood Risk

Sewer Flooding

2.5.1 No site-specific incidents of sewer flooding have been identified from relevant third party reports.

2.5.2 On the basis of the Site's rural setting, the presence of sewerage infrastructure is unlikely.

2.5.3 It can therefore be concluded that the risk of sewer flooding is **Low.**

Canal Flooding

2.5.4 There are no canals within the vicinity or upstream, in a position which could impact the Site. Therefore, the risk from canal flooding is considered to be **Negligible**.

Reservoir Flooding

2.5.5 The EA 'Flood Risk from Reservoirs' map shows that the Site is partially within the extents of a reservoir breach. The EA state that reservoir flooding is extremely unlikely to happen[1]. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in England, the EA ensure that reservoirs are inspected regularly, and essential safety work is carried out. It can therefore be concluded that the risk from reservoir flooding is considered to be **Low.**

2.6 Summary of Flood Risk

2.6.1 It can be concluded that the risk to the Site from all sources of flooding is **Negligible to Low**, and therefore mitigation is not required in this instance, however it would be prudent to include the below mitigation measures.

2.7 Embedded Mitigation

2.7.1 8m easements have been established around all watercourses, including Main Rivers and Ordinary Watercourses and 9 m from IDB assets.

2.7.2 All service cabling should be designed and installed to be flood resilient / water compatible. This should be achieved in accordance with appropriate design standards and best practise guidance.

2.7.3 Either fixed or tracker panels will be utilised throughout the Site.

2.7.4 The minimum height of the lowest part of the fixed solar panel units will be 0.6 m above ground level. There is potential to increase the height of the lower part of the fixed panels by raising the lower end of the panel mounting frames, which could provide at least 0.6 m of freeboard above any flooding. The maximum specified height of the upper edge of the fixed panels will remain at 3.5 m above ground level. It should be noted that no flooding with depths greater than 0.6 m is expected across the Site outside of the area that is located within the River Till Flood Storage Reservoir during the 1% AEP + CC and 0.1% AEP + CC events.

2.7.5 The tracker solar panel units will be mounted on raised frames (usually raised a minimum of 0.4 m) when on maximum rotation angle) and will therefore be raised above surrounding ground levels and fitted with a tracking system. During times of flooding, solar panels may be stowed by the tracking system algorithm onto a horizontal plane, to the minimum post height of 2.3 m above ground level. This ensures that all sensitive and electrical equipment on the solar panel is raised to a minimum of 2.3 m above ground level in the horizontal position.

[1] https://www.gov.uk/guidance/reservoir-flood-maps-when-and-how-to-use-them

2.7.6 Based on the above, the majority of the Site can accommodate either fixed or tracker panels with the exception of the area located in the River Till storage reservoir, where no development should occur.

2.7.7 The conversion units associated with the panels can be adequately waterproofed to withstand the effect of flooding. Where possible the conversion units equipment have been located in parts of the Site that are within Flood Zone 1. Where this hasn't been possible the equipment will be raised 0.6 m above the 0.1% AEP + CC flood level or where this is not possible as high as practicable.

Flood Warnings and Evacuation

2.7.8 The Site's area is part of the Lincs and Northants Flood Warnings / Flood Alerts. Access to the Site will be required relatively infrequently, typically by technicians for maintenance and inspection works or Site management. Such works can be scheduled as to avoid the site during times of flood.

2.8 Residual Risks

2.8.1 A residual risk is an exceedance event, such as the 1 in 1000 year (0.1% AEP) flood event that would overtop the River Till and potentially impact the Site. As the probability of a 1 in 1000 year flood event occurring is 0.1% in any given year, the probability is low and, therefore, no further mitigation beyond what is proposed is required.

2.8.2 In the event of the defences failing or an exceedance event occurring, the residual risk to people working within the Site can be managed through the implementation of an appropriate Site management plan, which recognises the residual risks and details what action is to be taken by staff in the event of a flood to put occupants in a place of safety.

2.9 Impact on Off-Site Flood Risk

2.9.1 The solar panels will be mounted on frames and raised above ground level allowing flood water to flow freely underneath. Therefore, there will be no loss of floodplain volume as a result of the proposed development and no increased in flood risk elsewhere.

2.9.2 The supporting infrastructure will be insignificant in size and should not increase flood risk elsewhere.

2.9.3 Surface water management has been considered in Section 5.0 of the Covering Report [EN010132/APP/WB6.3.10.1]

3.0 Conclusions and Recommendations

3.1 Conclusions

3.1.1 The proposed development is for a ground mounted solar farm and associated infrastructure and access roads.

Flood Risk

3.1.2 The EA 'Flood Map for Planning' map shows that the Site is located within Flood Zones 1, 2 and 3.

3.1.3 The risk of flooding from all sources has been assessed and the flood risk to the Site is considered to be **Negligible to Low** and therefore does not require Site-specific mitigation measures.

3.1.4 The solar panels will be mounted on raised frames and therefore raised above surrounding ground level allowing flood water to flow freely underneath. Therefore, there will be no loss of floodplain volume as a result of the development proposed within the Site.

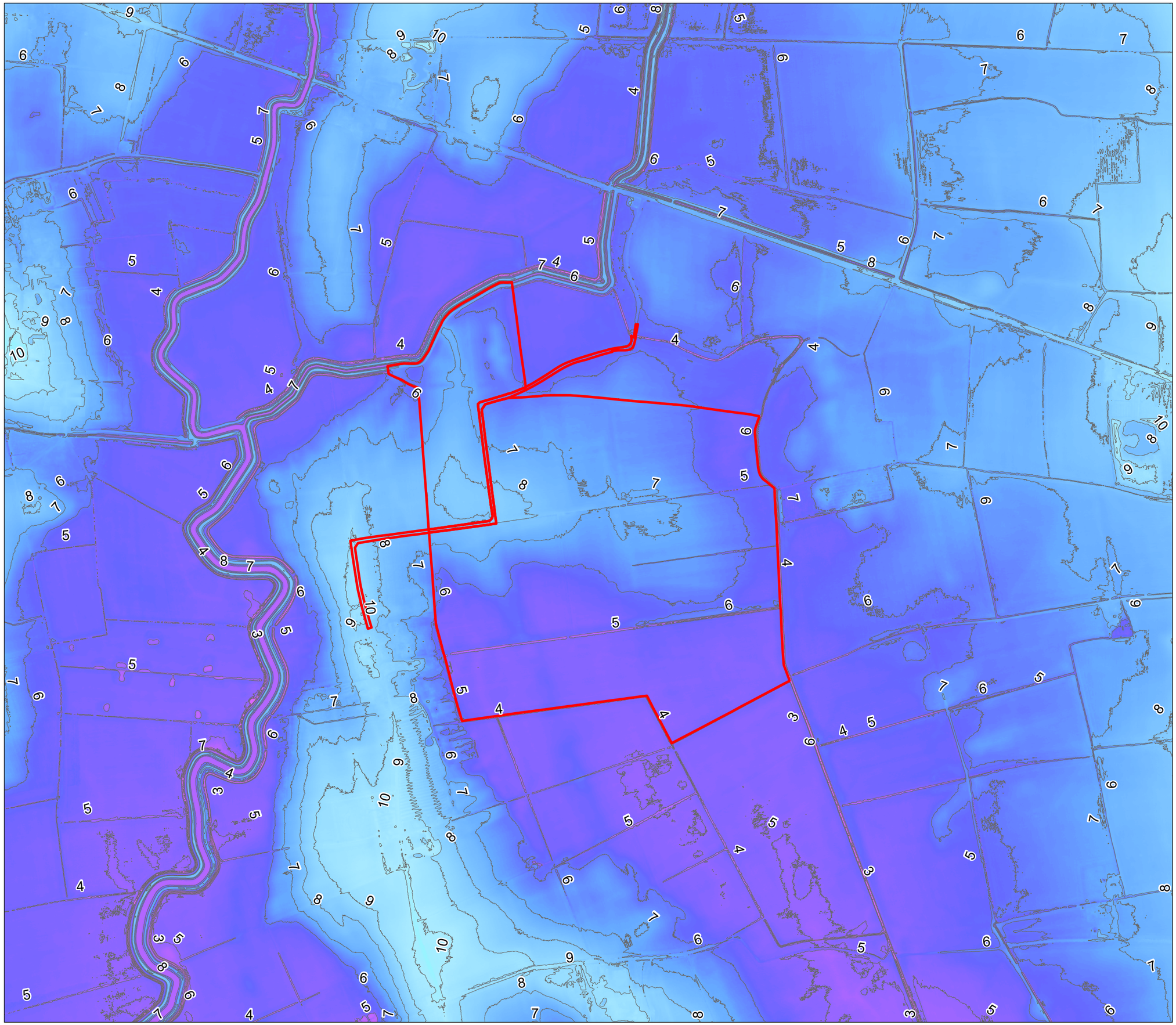
Drainage Strategy

3.1.5 The proposed development is free draining through perimeter gaps around all panels, allowing for infiltration as existing within the grassland/vegetation surrounding and beneath the panels. There will be minimal increase in impermeable area meaning the proposals will not increase surface water flood risk elsewhere.

3.1.6 Any surface water exceeding the infiltration capacity of the surrounding strata will naturally drain to the surrounding Land Drains and the River Till in line with the existing scenario.

3.1.7 The heavily managed agricultural land will be replaced with grassland. This will help to reduce run off rates by increasing the roughness of the ground, help to increase infiltration by reducing compaction, and improve water quality by reducing erosion and mobilisation of pollutants. As a result, runoff rates may be reduced following development when compared to the existing greenfield scenario.

Annex A – LiDAR Plan



Legend

West Burton 1 site boundary

Contours

LiDAR

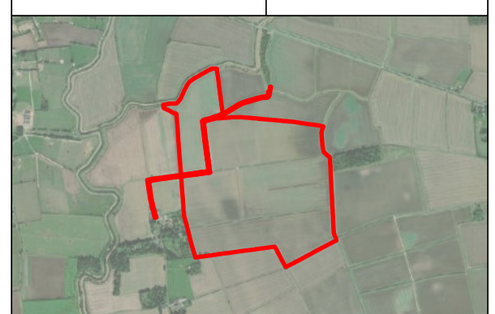
39.36

1.93

0 100 200 300 400 Meters

N

Figure	LiDAR & Contours		
Job	West Burton Solar Scheme		
Client	West Burton Solar Scheme		
Figure No. B	Revision A	Date 02/02/2023	
Drawn KH	Checked EB	Scale 1:10,000 @ A3	
Job No. 21-1098.03		Central GR 491570E 378543N	



DO NOT SCALE.
NOT FOR CONSTRUCTION.

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Annex B – Skellingthorpe Main Drain EA Water Body Classification Summary

Classification Item	Cycle 2 2016 Classification	Cycle 3 2019 Classification	Cycle 3 Objectives		
Ecological	Moderate	Moderate	Moderate	2015	Disproportionately expensive: Disproportionate burdens;Disproportionately expensive: Unfavourable balance of costs and benefits;Technically infeasible: No known technical solution is available
Biological quality elements	Moderate	Moderate	Moderate	2015	Disproportionately expensive: Unfavourable balance of costs and benefits;Technically infeasible: No known technical solution is available
Invertebrates	Moderate	Moderate	Moderate	2015	Disproportionately expensive: Unfavourable balance of costs and benefits;Technically infeasible: No known technical solution is available
Macrophytes and Phytobenthos Combined	NA	NA	Not assessed	2015	
Physico-chemical quality elements	Moderate	Moderate	Moderate	2015	Disproportionately expensive: Disproportionate burdens;Disproportionately expensive: Unfavourable balance of costs and benefits;Technically infeasible: No known technical solution is available
Ammonia (Phys-Chem)	High	High	Good	2015	
Dissolved oxygen	Bad	Bad	Poor	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens;Disproportionately expensive: Unfavourable balance of costs and benefits;Technically infeasible: No known technical solution is available
Phosphate	High	High	Good	2015	
Temperature	High	High	Good	2015	
pH	High	High	Good	2015	
Hydromorphological Supporting Elements	Supports good	Supports good	Supports good	2015	
Hydrological Regime	Supports good	Supports good	Supports good	2015	
Supporting elements (Surface Water)	Moderate	Moderate	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Mitigation Measures Assessment	Moderate or less	Moderate or less	Good	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens
Specific pollutants	NA	NA	Not assessed	2015	
Arsenic	NA	NA	NA	NA	
Chlorothalonil	NA	NA	NA	NA	
Chromium (VI)	NA	NA	NA	NA	
Copper	NA	NA	NA	NA	
Iron	NA	NA	NA	NA	
Manganese	NA	NA	NA	NA	
Pendimethalin	NA	NA	NA	NA	
Zinc	NA	NA	NA	NA	
Chemical	Good	Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority hazardous substances	Does not require assessment	Fail	Good	2063	Natural conditions: Chemical status recovery time
Benzo(a)pyrene	NA	Good	Good	2015	
Dioxins and dioxin-like compounds	NA	Good	Good	2015	
Heptachlor and cis-Heptachlor epoxide	NA	Good	Good	2015	
Hexabromocyclododecane (HBCDD)	NA	Good	Good	2015	
Hexachlorobenzene	NA	Good	Good	2015	
Hexachlorocyclohexane	NA		Good	2015	
Mercury and Its Compounds	NA	Fail	Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)	NA	Good	Good	2015	
Polybrominated diphenyl ethers (PBDE)	NA	Fail	Good	2063	Natural conditions: Chemical status recovery time

Priority substances	Does not require assessment	Good	Good	2015	
Cypermethrin (Priority)	NA	Good	Good	2015	
Fluoranthene	NA	Good	Good	2015	
Other Pollutants	Does not require assessment	Does not require assessment	Does not require assessment	2015	

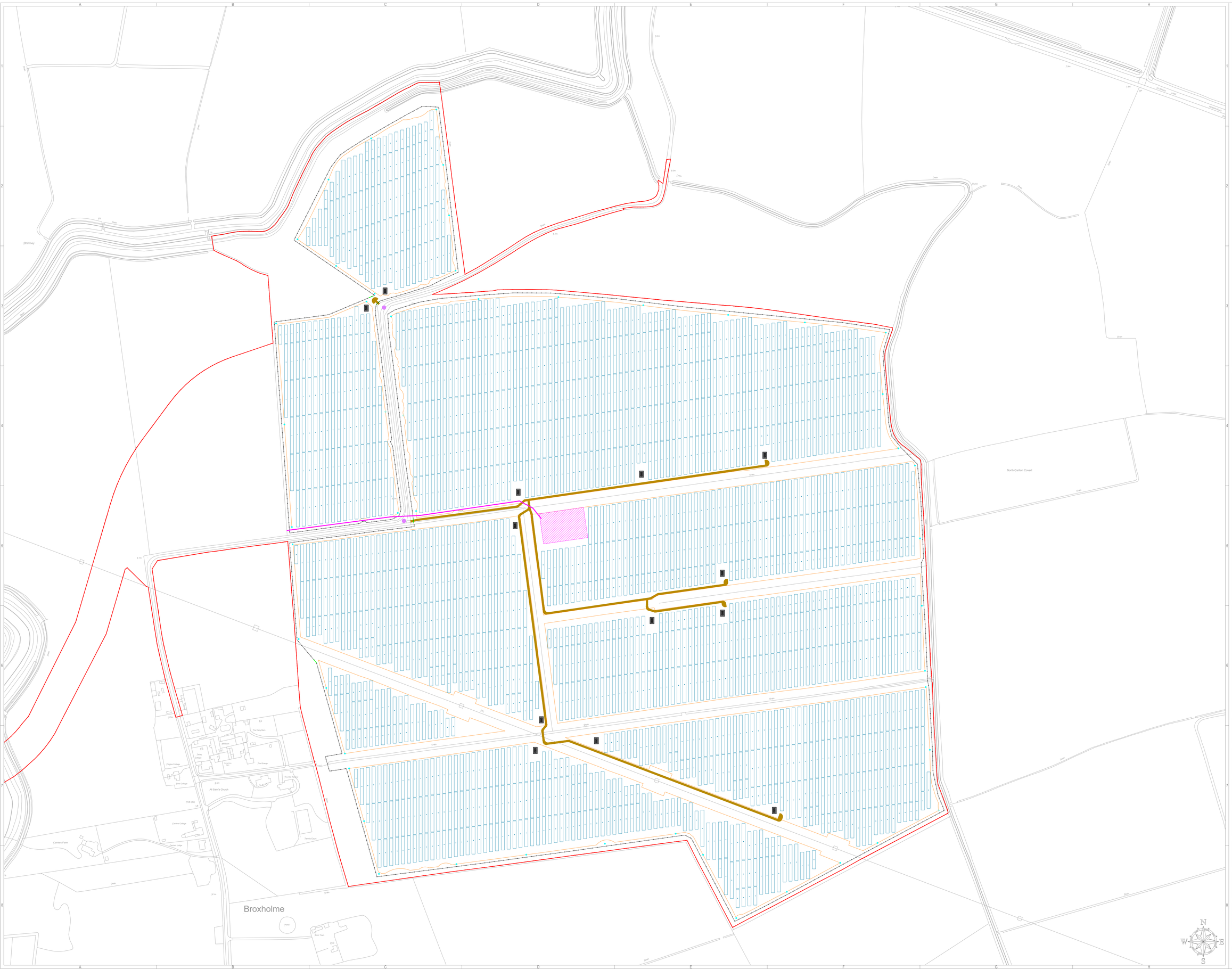
Annex C – River Till EA Water Body Classification Summary

Classification Item	Cycle 2 2019 Classification	Cycle 3 2019 Classification	Cycle 3 Objectives		
Ecological	N/A	Moderate	Moderate	2015	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Biological quality elements	N/A	Poor	Moderate	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Fish	N/A	Poor	Moderate	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Invertebrates	N/A	Good	Good	2015	
Macrophytes and Phytobenthos Combined	N/A		Not assessed	2015	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Physico-chemical quality elements	N/A	Moderate	Moderate	2015	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Acid Neutralising Capacity	N/A	High	Good	2015	
Ammonia (Phys-Chem)	N/A	High	Good	2015	
Dissolved oxygen	N/A	Poor	Good	2015	
Phosphate	N/A	Poor	Moderate	2027 - Low confidence	Disproportionately expensive: Disproportionate burdens; Disproportionately expensive: Unfavourable balance of costs and benefits
Temperature	N/A	High	Good	2015	
pH	N/A	High	Good	2015	
Hydromorphological Supporting Elements	N/A	Supports good	Supports good	2015	
Hydrological Regime	N/A	Supports good	Supports good	2015	

Supporting elements (Surface Water)	N/A	Good	Good	2015	
Mitigation Measures Assessment	N/A	Good	Good	2015	
Specific pollutants	N/A	High	High	2015	
Copper	N/A	High	High	2015	
Mecoprop	N/A	High	High	2015	
Chemical	N/A	Fail	Good	2063	Natural conditions: Chemical status recovery time; Technically infeasible: No known technical solution is available
Priority hazardous substances	N/A	Fail	Good	2063	Natural conditions: Chemical status recovery time; Technically infeasible: No known technical solution is available
Benzo(a)pyrene	N/A	Good	Good	2015	
Dioxins and dioxin-like compounds	N/A	Good	Good	2015	
Heptachlor and cis-Heptachlor epoxide	N/A	Good	Good	2015	
Hexabromocyclododecane (HBCDD)	N/A	Good	Good	2015	
Hexachlorobenzene	N/A	Good	Good	2015	
Hexachlorobutadiene	N/A	Good	Good	2015	
Mercury and Its Compounds	N/A	Fail	Good	2040	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)	N/A	Fail	Good	2039	Technically infeasible: No known technical solution is available
Polybrominated diphenyl ethers (PBDE)	N/A	Fail	Good	2063	Natural conditions: Chemical status recovery time
Priority substances	N/A	Good	Good	2015	
Cypermethrin (Priority)	N/A	Good	Good	2015	
Fluoranthene	N/A	Good	Good	2015	

Other Pollutants	N/A	Does not require assessment	Does not require assessment	2015	

Annex D – Illustrative Layout Plan



General Legend:

	Order Limits
	Fence
	Potential Development Area
	Mounting Structures and Solar PV Modules
	Conversion Units
	Electrical Substation
	High Voltage Electricity Cable
	Maintenance Tracks
	Gates
	Site Access
	CCTV

Project:	West Burton 1 Solar Project
Project Location:	Land East of Broxholme, Lincolnshire, LN1 2ZS
Ownership:	West Burton Solar Project Limited
Document Title:	Figure 4.1 Illustrative Site Layout Plan (WB1) APP/WB6.4.4.1 5(2)(a)
Sheet format:	A1 *841 x 594*
Scale:	1:2500

Document amendments:				Comments:
v.3	25/08/2022	A.A		Final Layout
v.4	30/09/2022	A.A		Layout
v.5	25/10/2022	A.A		Illustrative Layout
v.6	05/01/2023	A.A		Layout for Submission
v.7	02/02/2023	A.A		Layout for Submission

Company: Island Green Power UK Limited
Unit 20.2, Coda Studios
189 Munster Road, London SW6 6AW

0 25 50 100 200

Annex E – EA Response

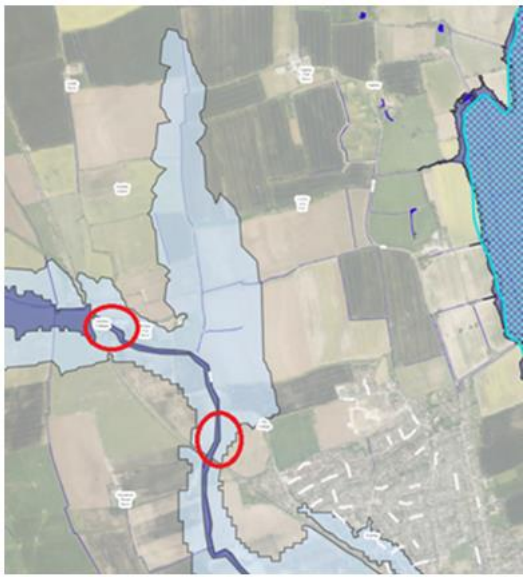
From: [redacted]
Sent: 23 February 2022 20:12
To: [redacted]
Subject: RE: Ref 210809/KAY12: 21-1098.01 - West Burton 1 / EA Data Request CCN/ 2021/ 229127

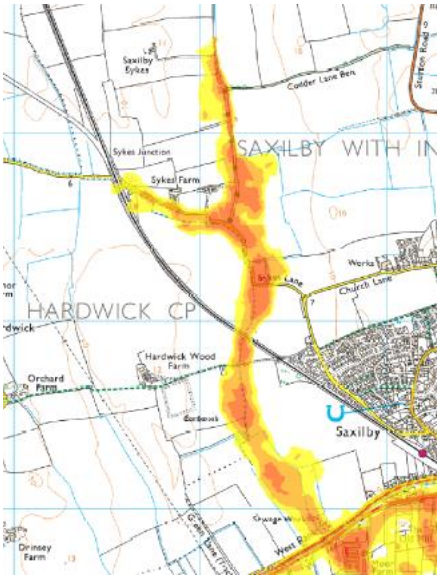
[redacted]

[redacted]

Firstly, as mentioned in my email this morning, the 2004 National Generalised Modelling Depth Maps should only be sent for site on non-main rivers and that are not covered by our local detailed modelling. West Burton Site 1 is on River Till which is main river so the data is not applicable. The data supplied should really only be used for the western part of West Burton Site 2, as shown below. [redacted]

For Site 1, the eastern part of Site 2 [ie the land within the Till reservoir] and for Cottam Site 1 the information provided in the tables of levels & flows, together with the 'With Defences Extents' should be used. I appreciate these are in channel levels, and so an assessment of the extent / depth of flooding from a breach would need to be carried out.

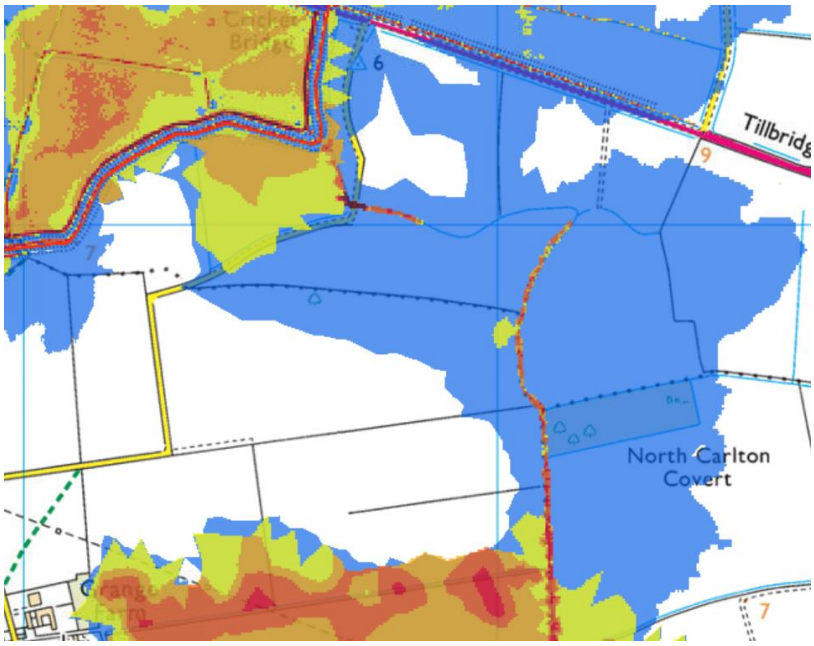




Secondly, in looking to find the depth of the flood zones along the eastern part of Site 2, as you've highlighted on the map below, I have discovered they are made up of outputs from two models though one model was supposed to have superseded the other. Also the depth data is only available for one, though thankfully this is the later model. Therefore I am unable to produce a suitable depth map for the whole of the flood zone. However the map below is from the latest model, which is the Upper Witham Lincoln 2015 model. This model is due to be updated over the next year, and whilst no significant changes are expected at this location we will be able to provide a clearer picture on the flood extents, depths, etc.

You can see from the map the eastern border you highlighted in your email is now in flood zone 1, though as there are drains along the border some flooding would still be possible it is just not picked up in our modelling. Any such flooding is likely to be relatively shallow, ie less than 0.5m.

The depths to the southern boundary are generally less than 0.5m although there is a line of deeper flooding, though this appears to be along the line of a drain so it is possible the lidar used for the 2D model at this location has picked up lower levels in the drain.



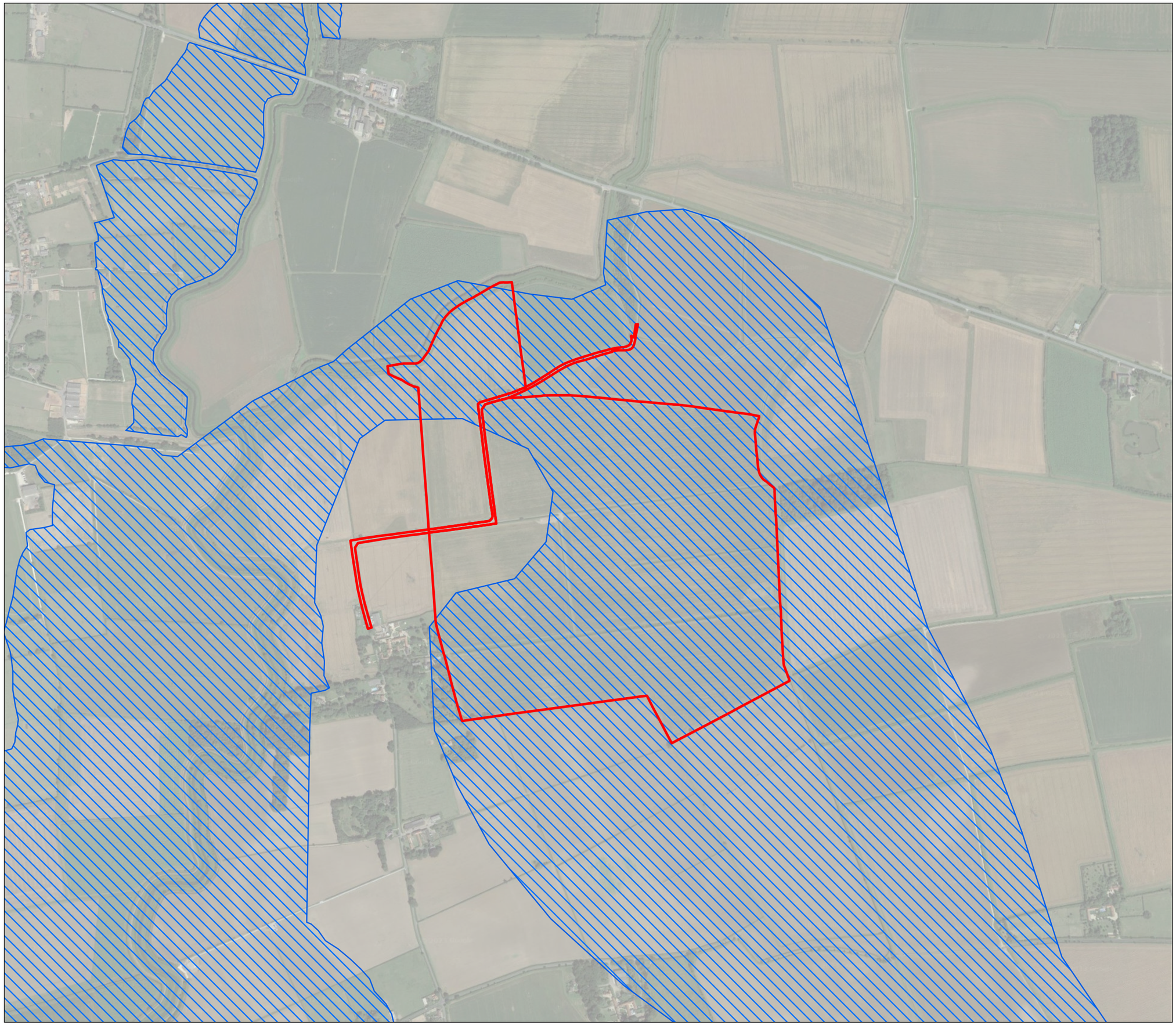
Finally, I have attached the depth grid data for the *WITH DEFENCES 1:1000 plus climate change [40 hour storm duration]* scenario from the Upper Witham Lincoln 2015 model. This is the most reliable depth data we have, though it only covers part of the sites. This should have been previously supplied.

[redacted]

Regards

[redacted]

Annex F – EA Historic Flood Map



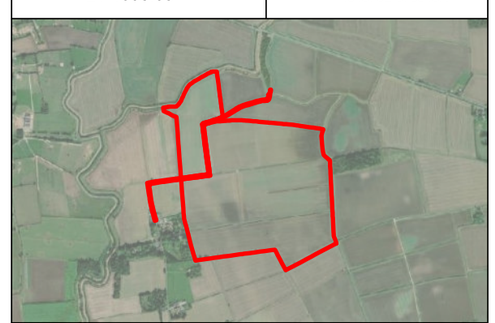
Legend

- West Burton 1 site boundary
- Historic Flood Map

0 100 200 300 400 Meters

N

Figure	EA Historic Flood Map		
Job	West Burton Solar Scheme		
Client	West Burton Solar Scheme		
Figure No. C	Revision A	Date 02/02/2023	
Drawn KH	Checked EB	Scale 1:10,000 @ A3	
Job No. 21-1098.03		Central GR 491570E 378543N	



DO NOT SCALE.
NOT FOR CONSTRUCTION.

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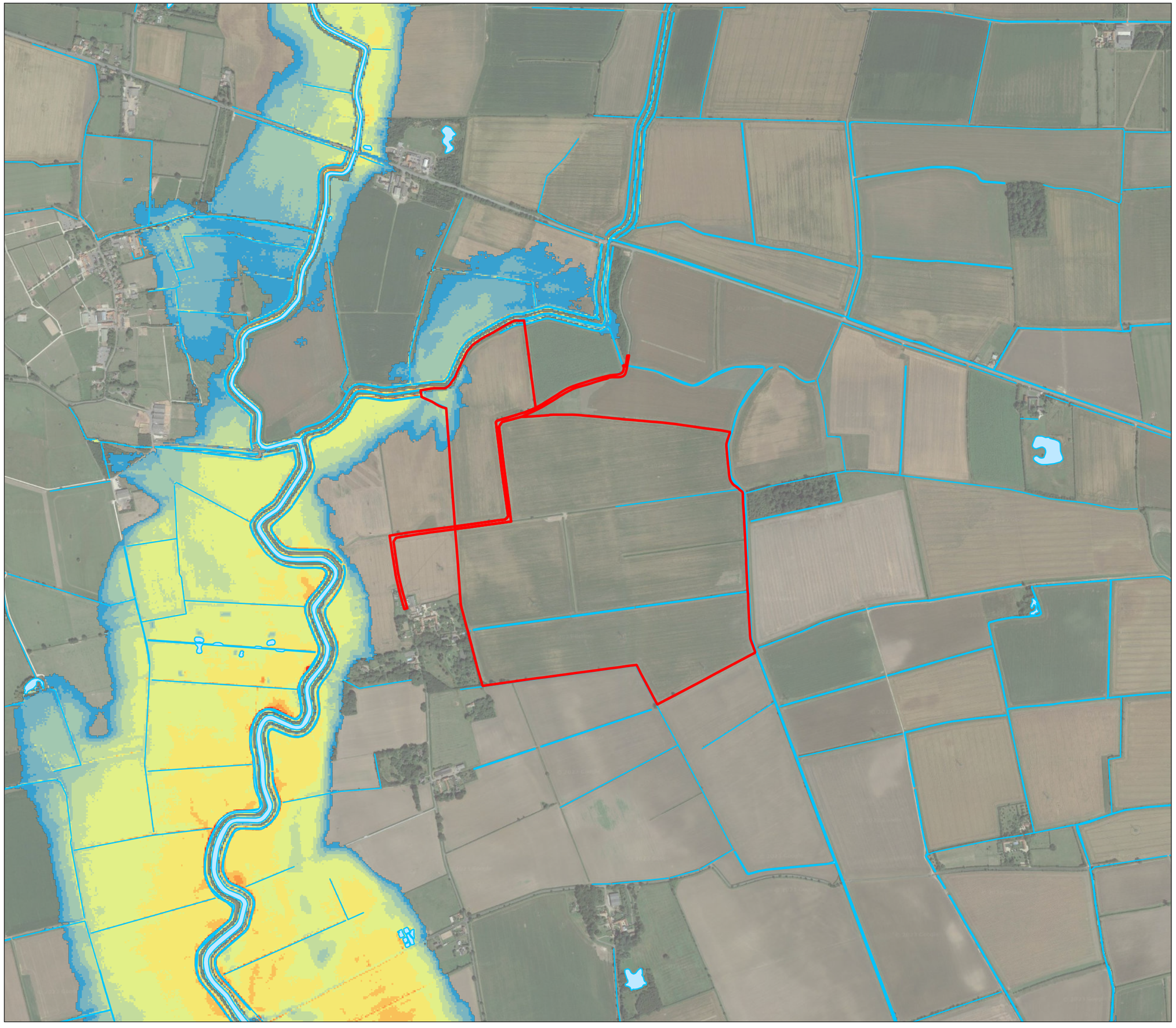
Annex G – 1% AEP + 20% CC Flood Depth Map



Legend

- West Burton 1 site boundary
- Watercourse
- Linear watercourses

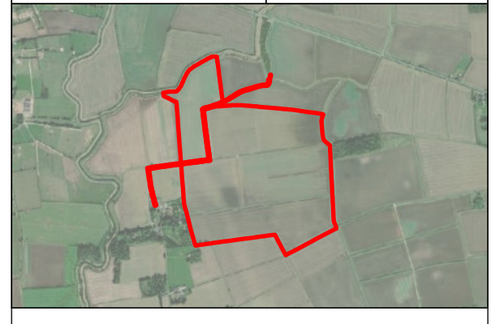
1 in 100 year event + CC depth (m)

- 0.01 m - 0.23 m
- 0.24 m - 0.5 m
- 0.6 m - 0.8 m
- 0.9 m - 1.1 m
- 1.2 m - 1.4 m
- 1.5 m - 1.7 m
- 1.7 m - 2.1 m
- 2.1 m - 2.57 m
- 2.57 m - 3.9 m
- 3.9 m - 4.83 m

0 150 300 450 600 Meters

N

Figure	1% AEP + CC Flood Depth Map		
Job	West Burton Solar Scheme		
Client	West Burton Solar Scheme		
Figure No. D	Revision A	Date 02/02/2023	
Drawn KH	Checked EB	Scale 1:12,000 @ A3	
Job No. 21-1098.03		Central GR 491570E 378543N	



DO NOT SCALE.
NOT FOR CONSTRUCTION.

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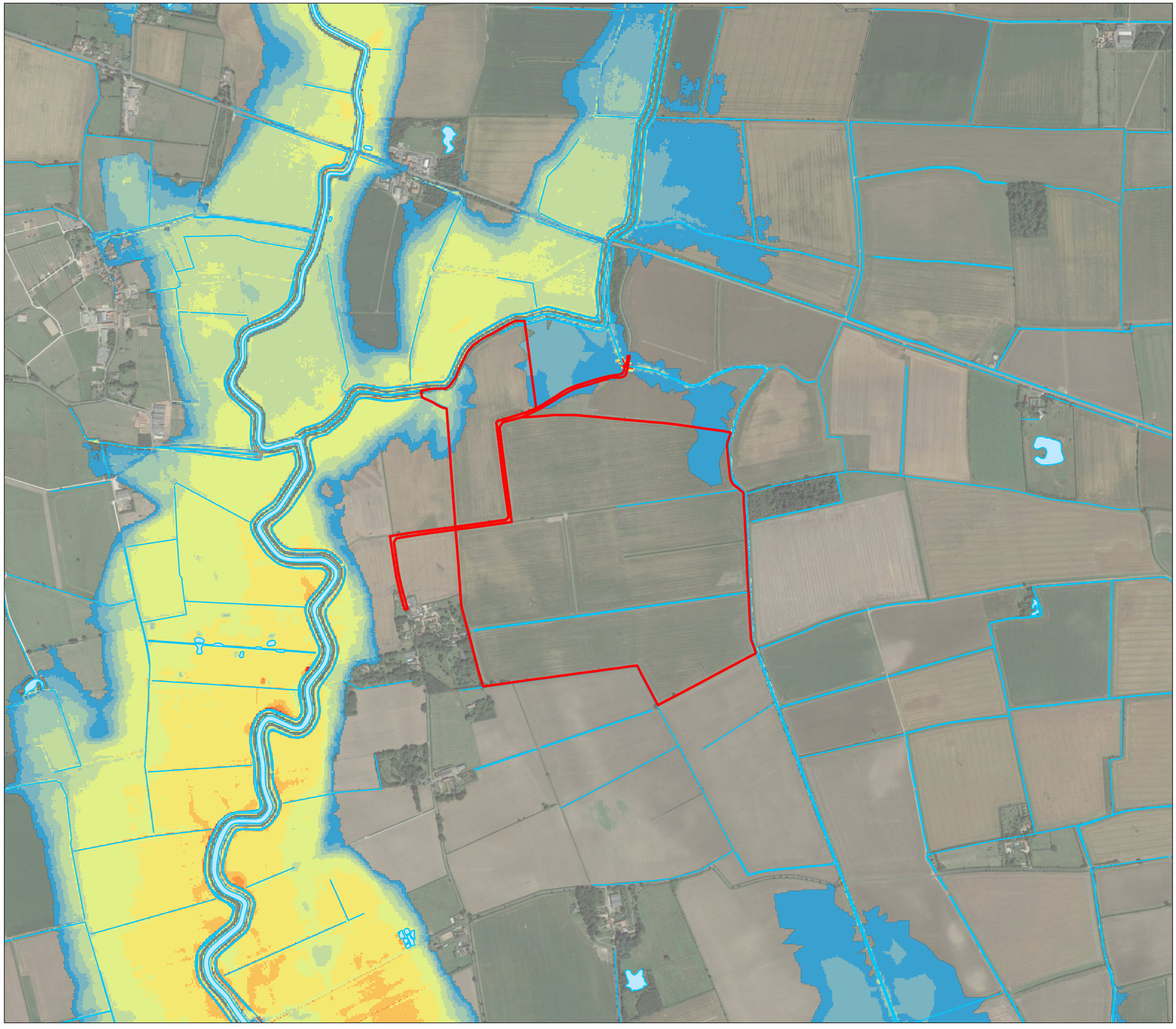
Annex H - 0.1% AEP + 20% CC Flood Depth Map



Legend

- West Burton 1 site boundary
- Watercourse
- Linear watercourses

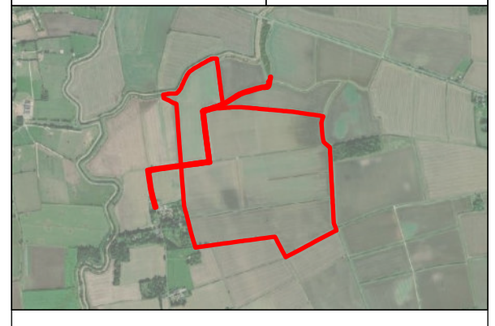
1 in 1000 year event + CC depth (m)

- 0.01 m - 0.27 m
- 0.28 m - 0.57 m
- 0.58 m - 0.88 m
- 0.89 m - 1.2 m
- 1.3 m - 1.55 m
- 1.55 m - 1.9 m
- 1.91 m - 2.26 m
- 2.27 m - 2.7 m
- 2.7 m - 3.3 m
- 3.4 m - 5.2 m

0 150 300 450 600 Meters

N

Figure	0.1% AEP + CC Flood Depth Map		
Job	West Burton Solar Scheme		
Client	West Burton Solar Scheme		
Figure No. E	Revision A	Date 02/02/2023	
Drawn KH	Checked EB	Scale 1:12,000 @ A3	
Job No. 21-1098.03		Central GR 491570E 378543N	



DO NOT SCALE.
NOT FOR CONSTRUCTION.

DeltaSimons