

# West Burton Solar Project

## Environmental Statement

### Appendix 10.2: Flood Risk Assessment and Drainage Strategy – Cable Route

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# Flood Risk Assessment and Drainage Strategy

## Appendix A - West Burton Cable Route

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## Annexes

ANNEX A - PROPOSED CABLE ROUTE AND WATERCOURSE CROSSING POINTS

## 1.0 Cable Route Description

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

<b>Co-ordinates</b>	<p>Originating approximately at National Grid Reference (NGR) 491514, 378519: and Completing approximately at NGR: 479247, 385289</p>
<b>Cable Route Description</b>	<p>The cable route corridor will connect the Sites (West Burton 1, 2 and 3) which comprise the West Burton Solar Scheme. The route of the cable runs through an area of countryside located across Lincolnshire and Nottinghamshire. The cable route originates at the West Burton 1 Site, which is located to the east of Broxholme. The cable route then runs in a south-westerly direction, crossing the River Till to cross through the West Burton 2 Site, which is located around Ingleby. The cable route then runs in a generally north-westerly direction across agricultural land to reach the southern boundary of the West Burton 3 Site. The cable route continues in a north-westerly direction through West Burton 3. The cable route leaves the West Burton 3 Site and heads in a westerly direction, crossing the A156 and the River Trent to pass to the south of Coates. The final run of the cable route is in a generally north-westerly direction through rural land to the west of the River Trent towards the end connection location of the West Burton power station.</p>
<b>Existing Route Conditions</b>	<p>Online mapping (including Google Maps / Google Streetview imagery (accessed February 2023)) shows that the cable route runs through greenfield land mainly comprising agricultural / arable fields. The proposed route crosses several watercourses and land drains.</p>
<b>Hydrology</b>	<p>The River Trent flows in a southerly direction through the western extent of the cable route. The River Till flows in a southerly direction through the eastern extent of the cable route. Both the River Trent and River Till are Main Rivers and are therefore the responsibility of the EA to maintain.</p> <p>The cable route passes through and within close proximity to many watercourses given its significant length. Any watercourse which is not a Main River or within the IDB's catchment areas are designated as an Ordinary Watercourse (responsibility of the Lead Local Flood Authority (LLFA) to maintain).</p>
<b>Water Framework Directive Status</b>	<p>The Cable Route is located within the Marton Drain (Trib of Trent), Catchwater Drain, Trent from Carlton-on-Trent to Laughton Drain, Seymour Drain (trib of Trent), Skellingthorpe Main Drain and River Till (Lower Till) Waterbody Catchments.</p> <p>All Catchments have a Cycle 3 2019 Ecological status of Moderate and a Failing chemical status.</p>
<b>Geology</b>	<p>Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the cable route is underlain by superficial deposits that include Alluvium in the southern and central areas, the Home Pierrepont Sand and Gravel Member in the central area and occasional discrete pockets of Till (Diamicton) and Glaciofluvial deposits in the north, centre and south. Superficial deposits are mapped as absent across the north-western area and between West Burton 2 and 3 in the south.</p>

	<p>The underlying bedrock is noted to comprise the Charmouth Mudstone Formation, Scunthorpe Mudstone Formation and Penarth Group (Mudstone) in the south and the Mercia Mudstone Group across the central and northern areas.</p> <p>The geological mapping is available at a scale of 1:625,000 and 1:50,000 and as such may not be accurate on a Site-specific basis.</p>
<b>Proposed Scheme</b>	<p>The Scheme is for a ground mounted solar photo-voltaic plant and associated electrical equipment battery storage, cable route and access. This Appendix refers solely to the proposed cable route.</p>

## 2.0 Assessment of Flood Risk

### 2.1 Tidal Flood Risk

2.1.1 The Cable Route is situated inland at a minimum of 3.5 m AOD. Given the nature of the proposed development (sub surface cable), the risk from tidal flooding is considered to be Negligible.

### 2.2 Fluvial Flood Risk

#### EA Online Flood Maps

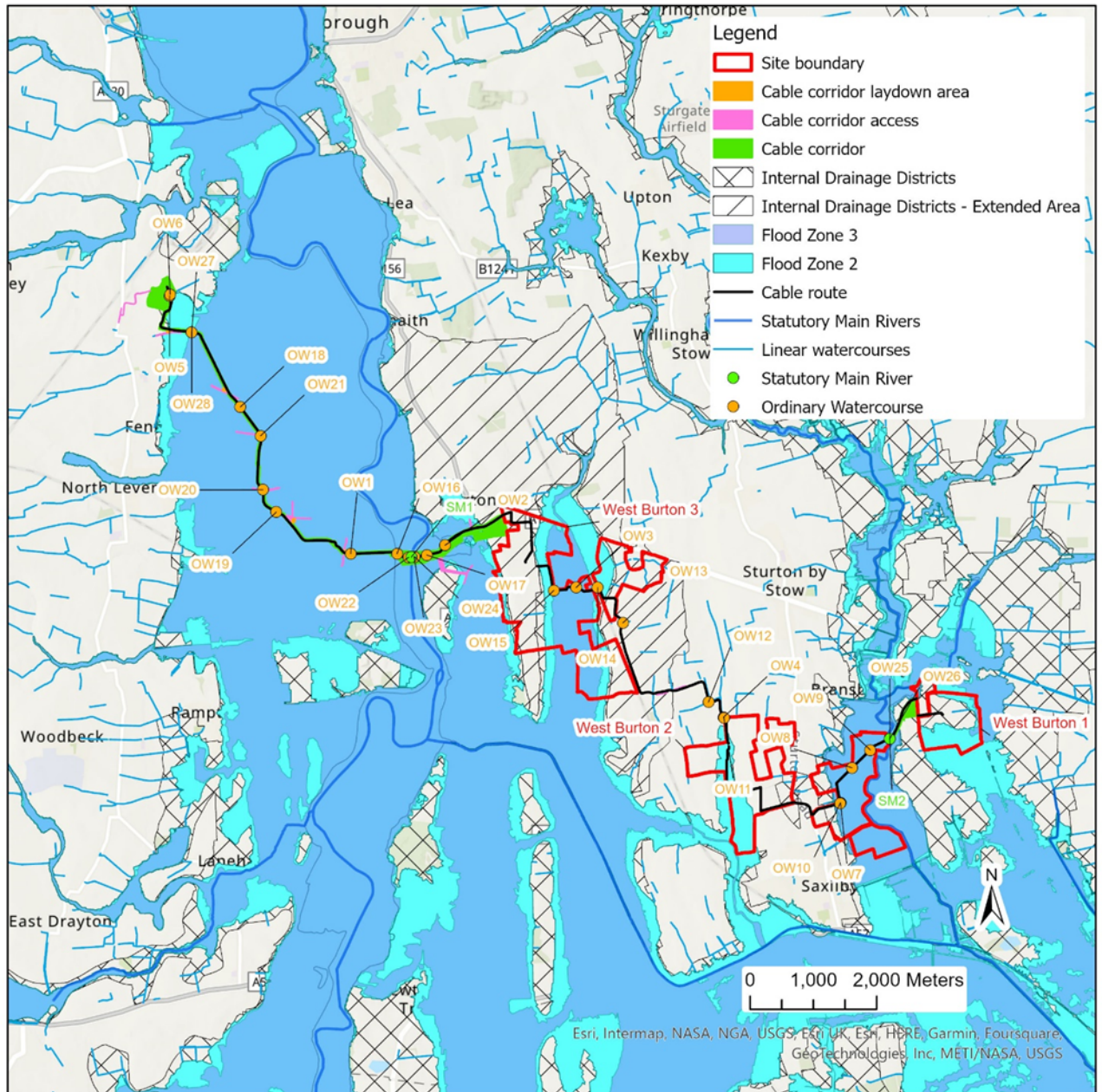
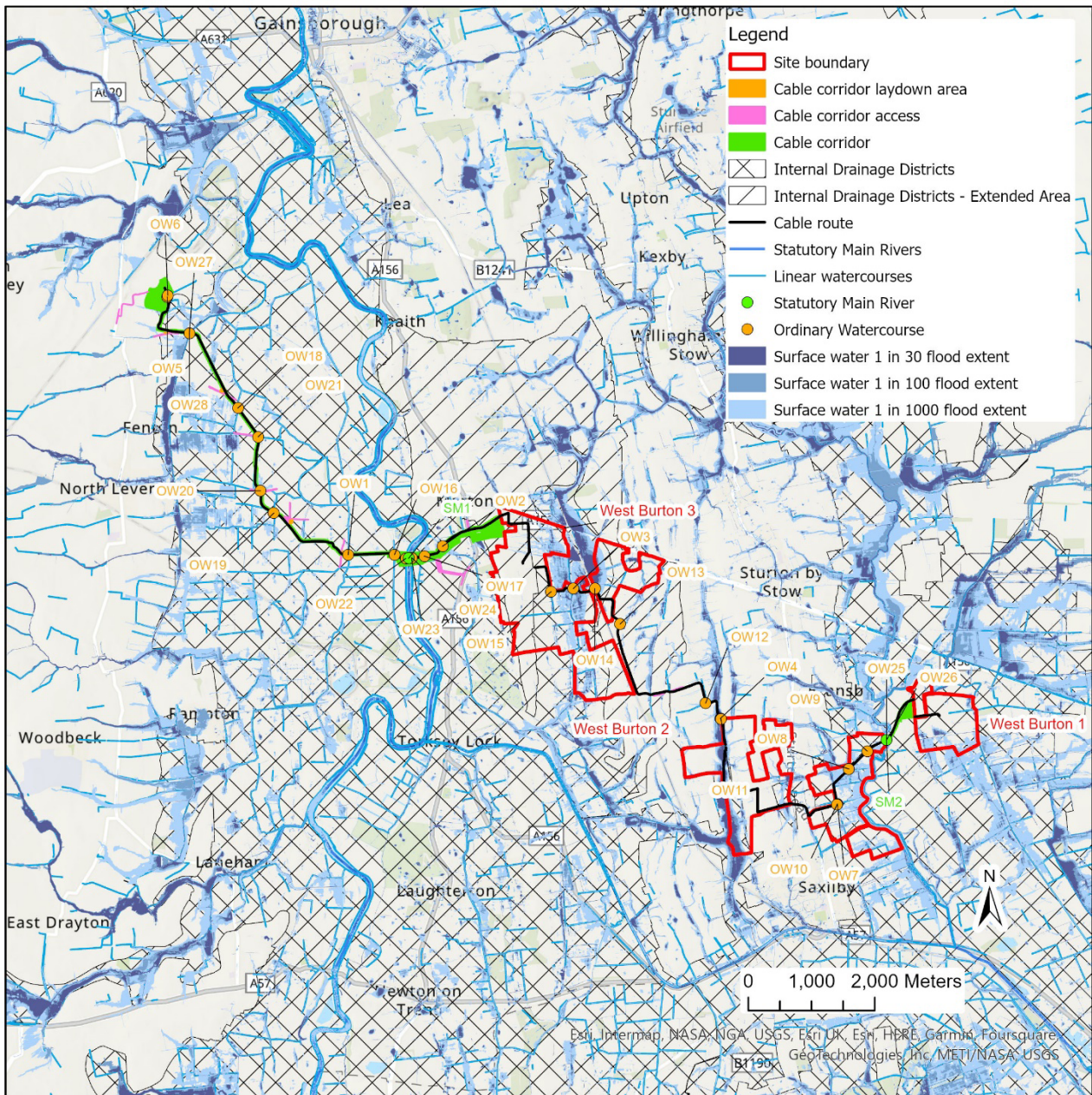


Figure 1: EA's Flood Map for Planning

- 2.2.1 The EA's Flood Map for Planning (Figure 1) indicates the majority of the cable route is located within Flood Zone 3, with some sections located in Flood Zone 1 and some minor sections in Flood Zone 2. Flood risk is associated with the River Till and River Trent.
- 2.2.2 Flood Zone 3 is defined as fluvial flooding with a 1 in 100 (>1% AEP) or greater annual probability, whereas Flood Zone 2 is defined as a 1 in 100 and 1 in 1000 (1% - 0.1% AEP) annual probability of fluvial flooding. Flood Zone 1 is defined as less than a 1 in 1000 (<0.1% AEP) annual probability of fluvial flooding.
- 2.2.3 Based on the nature of the proposed development (sub surface cable) it can be concluded that the Cable Route is at Very 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 (Surface Water), shown in Figure 2, indicates that the majority of the cable route is at Very Low (< 0.1% annual probability) risk of surface water flooding. Surface water flooding with a Medium (1% - 3.3% annual probability) and High (>3.3% annual probability) risk of occurrence is present in the eastern half of the cable route.
- 2.3.2 The extents of the surface water risk largely concur with the courses of the watercourses which run through the wider area.
- 2.3.3 Based on the above and considering the nature of the proposed development (sub surface cable) the overall risk of surface water flooding is considered to be Very Low.



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

## 2.4 Groundwater Flood Risk

- 2.4.1 There is no information within relevant third party reports to suggest that the cable route has experienced historical groundwater flooding.
- 2.4.2 Given the nature of the proposed development (sub surface cable) it can 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 cable route-specific incidents of sewer flooding have been identified from relevant third party reports.



2.5.2 The cable has been routed to avoid any utility infrastructure as far as possible. Clashes with sewerage infrastructure is not anticipated.

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

### **Reservoir and Canal Flooding**

2.5.4 There are no canals within the immediate vicinity of the cable route. Therefore, the risk from canal flooding is considered to be Negligible.

2.5.5 The EA 'Flood Risk from Reservoirs' map shows that some portions of the cable route are within the extents of a reservoir breach.

2.5.6 The EA state that reservoir flooding is extremely unlikely to happen<sup>1</sup>. 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 Very Low.

## **2.6 Summary of Flood Risk**

2.6.1 It can be concluded that the risk to the Cable Route from all sources of flooding is Negligible to Low, and therefore mitigation is not required in this instance.

## **2.7 Mitigation**

2.7.1 As stated above, no specific mitigations for the proposed cable are considered to be necessary.

## **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 local watercourses and potentially impact the cable route. However given the nature of the proposed development (sub surface cable) and 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.

## **2.9 Impact on Off-Site Flood Risk**

2.9.1 The cable route will be below the existing surface level and therefore, there will be no loss of floodplain volume as a result of the proposed development and no increased in flood risk elsewhere.

## **2.10 Other Considerations**

2.10.1 Crossing of multiple watercourses is required to facilitate the cable run. It is understood that any crossing proposed will be undertaken using a directional drilling methodology to ensure the existing watercourse morphology is not impacted. Any crossing of a watercourse will require the requisite permission from the controlling authority. An analysis of the proposed cable route has been undertaken and there are thirty identified crossings of watercourses, a map showing the crossing points is included as Annex A.

2.10.2 Table 1 overleaf shows the crossing locations and the controlling authority.

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<sup>1</sup> <https://www.gov.uk/guidance/reservoir-flood-maps-when-and-how-to-use-them>

**Table 1: Watercourse Crossing Locations**

<b>Crossing</b>	<b>Grid Ref</b>	<b>Consultee</b>
SM1	483109, 381013	Environment Agency
SM2	490671, 378139	Environment Agency
OW1	482150, 381070	IDB & LLFA
OW2	483643, 381202	IDB & LLFA
OW3	485711, 380531	IDB & LLFA
OW4	488043, 378477	LLFA
OW5	479287, 385149	LLFA
OW6	479295, 385172	LLFA
OW7	489894, 377124	IDB & LLFA
OW8	490076, 377678	IDB & LLFA
OW9	490365, 377961	IDB & LLFA
OW10	489888, 377115	IDB & LLFA
OW11	488051, 378472	LLFA
OW12	487806, 378718	LLFA
OW13	486453, 379972	IDB & LLFA
OW14	486054, 380533	IDB & LLFA
OW15	485360, 380484	IDB & LLFA
OW16	482883, 381069	IDB & LLFA
OW17	483355, 381046	IDB & LLFA
OW18	480406, 383390	IDB & LLFA
OW19	480973, 381725	IDB & LLFA
OW20	480762, 382079	IDB & LLFA
OW21	480724, 382934	IDB & LLFA
OW22	483064, 381009	IDB & LLFA
OW23	483153, 381017	IDB & LLFA
OW24	483159, 381018	IDB & LLFA
OW25	490673, 378140	IDB & LLFA
OW26	490673, 378140	IDB & LLFA
OW27	479636, 384571	IDB & LLFA
OW28	479636, 384571	IDB & LLFA

## 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. This appendix refers solely to the cable route which connects all the Sites within the Scheme.

#### **Flood Risk**

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

3.1.3 The cable route will be below the existing surface level and therefore, there will be no loss of floodplain volume as a result of the proposed development and no increased in flood risk elsewhere.

#### **Drainage Strategy**

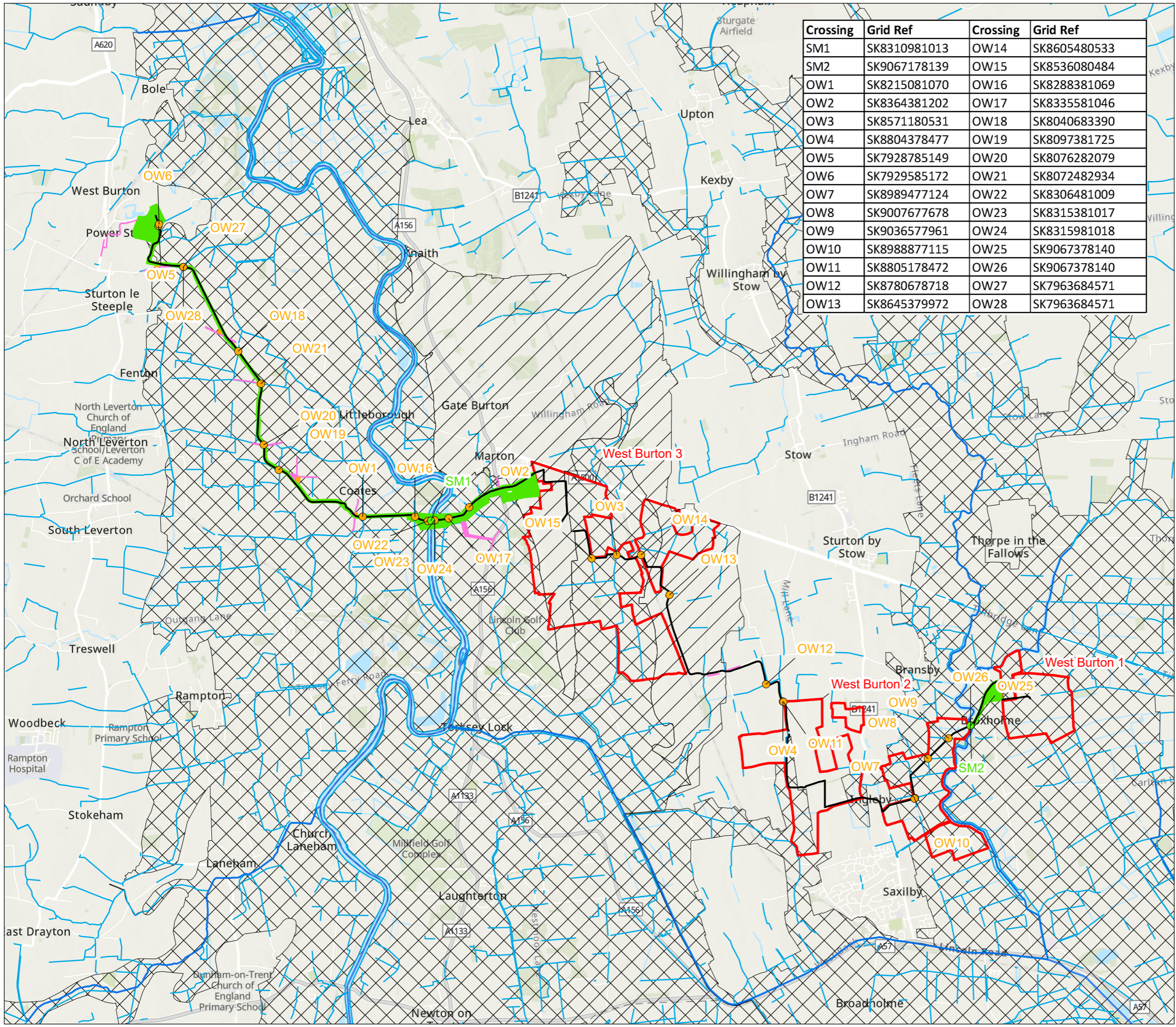
3.1.4 Given the nature of the proposed development (sub surface cable) no formal drainage will be required at the Site.

### 3.2 Recommendations

3.2.1 The recommendation below has been taken into account when determining the cable route;

- 8m easements have been established around all watercourses, including Main Rivers and Ordinary Watercourses and 9 m from IDB assets. Where crossings of watercourses are required relevant permissions will be sought from the Environment Agency, LLFA and / or relevant IDB.

# Annex A - Proposed Cable Route and Watercourse Crossing Points



Crossing	Grid Ref	Crossing	Grid Ref
SM1	SK8310981013	OW14	SK8605480533
SM2	SK9067178139	OW15	SK8536080484
OW1	SK8215081070	OW16	SK8288381069
OW2	SK8364381202	OW17	SK8335581046
OW3	SK8571180531	OW18	SK8040683390
OW4	SK8804378477	OW19	SK8097381725
OW5	SK7928785149	OW20	SK8076282079
OW6	SK7929585172	OW21	SK8072482934
OW7	SK8989477124	OW22	SK8306481009
OW8	SK9007677678	OW23	SK8315381017
OW9	SK9036577961	OW24	SK8315981018
OW10	SK8988877115	OW25	SK9067378140
OW11	SK8805178472	OW26	SK9067378140
OW12	SK8780678718	OW27	SK7963684571
OW13	SK8645379972	OW28	SK7963684571

**Legend**

- Site boundary
- Cable corridor
- Cable corridor access
- Cable corridor laydown area
- Internal Drainage Districts
- Internal Drainage Districts - Extended Area
- Cable route
- Statutory Main Rivers
- Linear watercourses

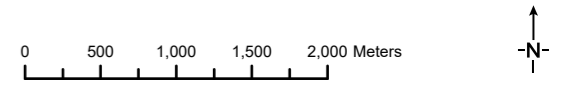


Figure Cable Route Crossing Map			
Job West Burton Solar Scheme			
Client West Burton Solar Scheme			
Figure No.	1	Revision	A
		Date	27/01/2023
Drawn	KH	Checked	EB
		Scale	1:50,000 @ A3
Job No.	21-1098.03		Central GR
			485327E 381112N