

Cottam Solar Project

Environmental Statement Appendix 10.1: Annex B – 10.1.1 Flood Risk Assessment and Drainage Strategy – Cable Route

Prepared by: Delta-Simons
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Flood Risk Assessment and Drainage Strategy

Annex B - Cottam Cable Route

Presented to: **Cottam Solar Energy Farm Limited**

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**Protecting people
and planet**

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1.0 Site Description

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

Co-ordinates	Originating approximately at National Grid Reference (NGR) 487961, 394485: and Completing approximately at NGR: 481493, 378838
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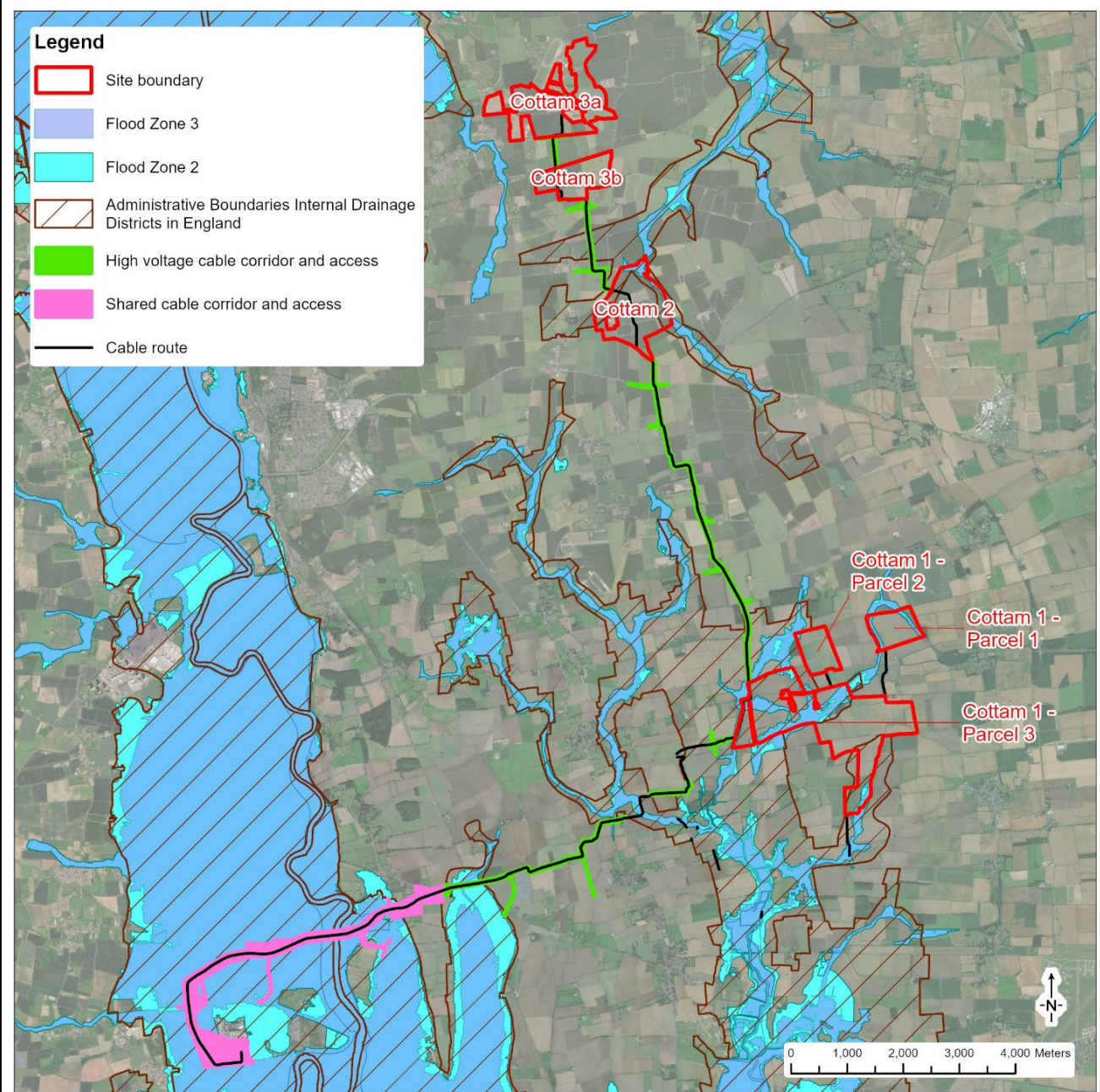


Figure 1: Cable Route Location including EA's Flood Map for Planning

Site Location	The cable route corridor is proposed to connect the Sites and Sub-Sites to one another and then to the connection point at Cottam Power Station.
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Existing Site Conditions	Online mapping (including Google Maps / Google Streetview imagery (accessed October 2022) shows that the Site is greenfield comprising agricultural / arable fields. The proposed route crosses several watercourses and land drains.
Hydrology	<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 centre of the cable route. Both the River Trent and River Till are Main Rivers and is therefore the responsibility of the Environment Agency (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 Internal Drainage Board (IDB) IDB's catchment areas are designated as an Ordinary Watercourse (responsibility of the Lead Local Flood Authority (LLFA) to maintain).</p> <p>Over its length the cable route passes under a total of 31 watercourses including 21 Ordinary Watercourses as well as the River Trent and the River Till.</p>
Water Framework Directive Status	<p>The Cable Route is located within the River Trent from Carlton-on-Trent to Laughton Drain, Laughton Drain Catchment (trib of Trent), Eau from Source to Northorpe Beck Catchment, River Till and Fillingham Beck Catchments. All Catchments have a Cycle 3 2019 Ecological status of Moderate and a Failing chemical status.</p> <p>A summary of the Water Body Classification for the catchments are included as Annexes C and D.</p>
Geology	<p>Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the majority of the Site, including most of the northern extent is not underlain by superficial deposits. The southern extent of the Cable Route in the vicinity of the Main Rivers is underlain by Till, River Terrace Deposits and Alluvium.</p> <p>The area east of the River Trent is identified as comprising bedrock of the Lias Group (Mudstone, Siltstone, Limestone and Sandstone) whereas the area in the vicinity of and west of the River Trent is underlain by Triassic Rocks (Undifferentiated) comprising of Mudstone, Siltstone and Sandstone.</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>
Proposed Site Conditions	The wider proposed development is for a ground mounted solar photo-voltaic plant and associated electrical equipment battery storage, cable route and access. This Annex refers solely to the proposed cable route.

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

2.2.1 The EA's Flood Map for Planning (Figure 1) indicates the vast majority of the cable route is within Flood Zone 1 (<0.1% AEP) of river flooding. The southern extent of the cable within the vicinity of the River Trent and the central extent in the vicinity of the River Till is situated within Flood Zones 2 and 3. Flood Zone 2 is defined as land assessed as having between a 1 in 1000 to 1 in 100 (0.1% to 1% Annual Exceedance Probability (AEP)) of river flooding. Flood Zone 3 defined as land assessed as having a 1 in 100 or greater (>1% AEP) of river flooding.

2.2.2 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 western extent of the Cable Route and along parts of the eastern Cable Route boundary.

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.

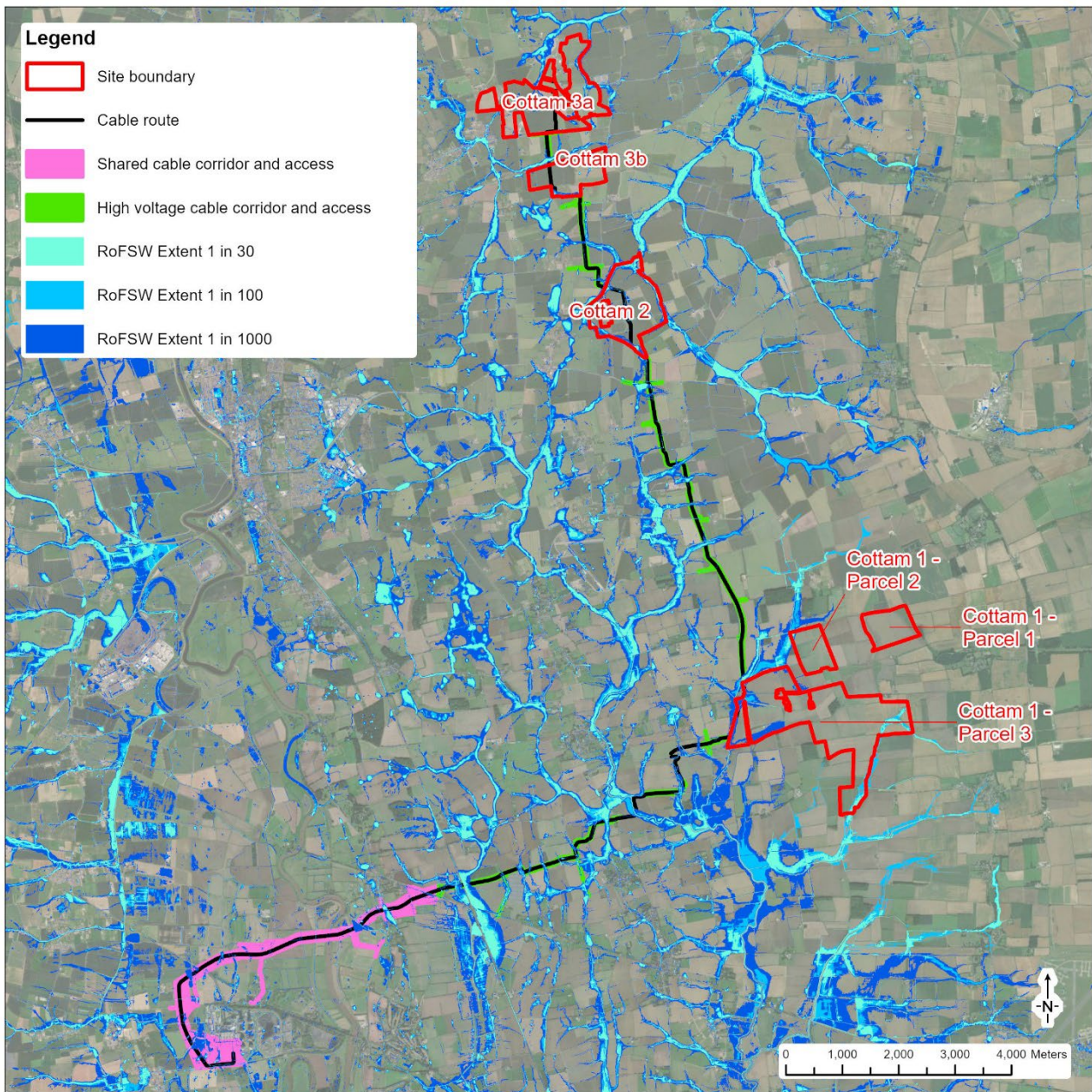


Figure 2: EA's Long-Term Flood Risk Map (Flood Risk from Surface Water)

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 site-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 vicinity of the Site. Therefore, the risk from canal flooding is considered to be Negligible.

2.5.5 The EA 'Flood Risk from Reservoirs' map shows that the west of the Cable Route is within the extents of a reservoir breach.

2.5.6 The EA states within their Preliminary Flood Risk Assessment for England (dated October 2018) that 'reservoir flooding is extremely unlikely to happen'. 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 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-one identified crossings of watercourses, a map showing the crossing points is included as Annex B.

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

Table 1: Watercourse Crossing Locations

Crossing	Grid Ref	Consultee
SM1	SK8856083118	Environment Agency
SM2	SK8310980969	Environment Agency
OW1	SK8763693244	Scunthorpe & Gainsborough Water Management Board
OW2	SK8802292467	Scunthorpe & Gainsborough Water Management Board
OW3	SK8875291182	Lincolnshire County Council
OW4	SK8927989334	Lincolnshire County Council
OW5	SK8944189143	Lincolnshire County Council
OW6	SK8954688629	Lincolnshire County Council
OW7	SK8978087947	Lincolnshire County Council
OW8	SK9000387498	Lincolnshire County Council
OW9	SK9034386877	Lincolnshire County Council
OW10	SK9046485461	Upper Witham IDB
OW11	SK9037985029	Upper Witham IDB
OW12	SK9022784498	Upper Witham IDB
OW13	SK8983384375	Upper Witham IDB
OW14	SK8930584143	Upper Witham IDB
OW15	SK8804683007	Lincolnshire County Council
OW16	SK8693982215	Lincolnshire County Council
OW17	SK8535681845	Trent Valley IDB
OW18	SK8367981162	Trent Valley IDB
OW19	SK8335581013	Trent Valley IDB
OW20	SK8287980943	Trent Valley IDB
OW21	SK8263380914	Trent Valley IDB
OW22	SK8252680886	Trent Valley IDB
OW23	SK8214480716	Trent Valley IDB
OW24	SK8207980689	Trent Valley IDB
OW25	SK8139980627	Trent Valley IDB
OW26	SK8069680288	Trent Valley IDB
OW27	SK8046879842	Trent Valley IDB
OW28	SK8052479409	Trent Valley IDB
OW29	SK8124378685	Trent Valley IDB

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 annex refers solely to the cable route connecting all sub Sites within the wider solar 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 Site-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 considered 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 should be sought from the Environment Agency, LLFA and / or relevant IDB.

Annex A - Limitations

Limitations

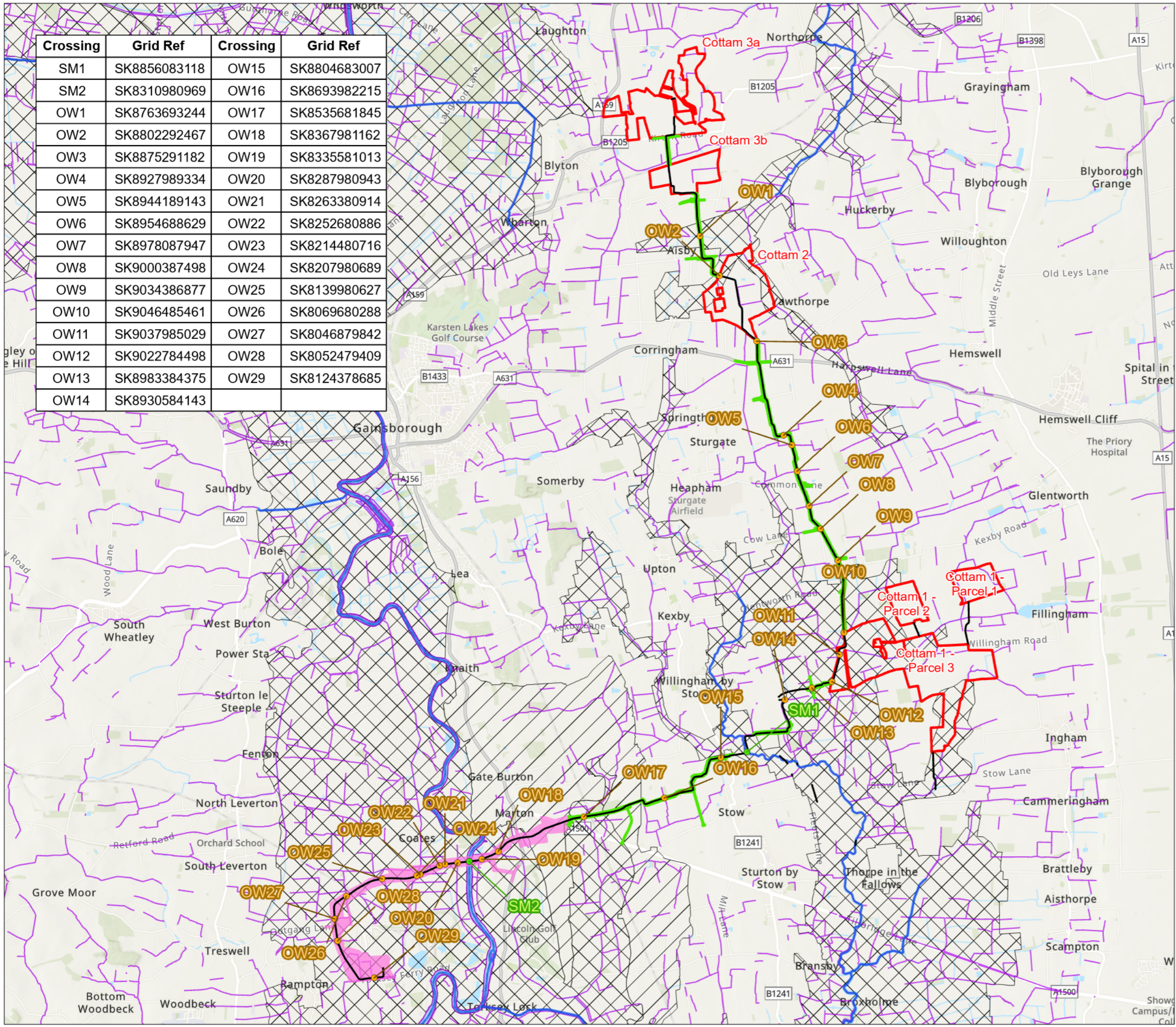
The recommendations contained in this Report represent Delta-Simons professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Environmental Consultant. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

Delta-Simons obtained, reviewed and evaluated information in preparing this Report from the Client and others. Delta-Simons conclusions, opinions and recommendations has been determined using this information. Delta-Simons does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

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Annex B - Proposed Cable Route and Watercourse Crossing Points

Crossing	Grid Ref	Crossing	Grid Ref
SM1	SK8856083118	OW15	SK8804683007
SM2	SK8310980969	OW16	SK8693982215
OW1	SK8763693244	OW17	SK8535681845
OW2	SK8802292467	OW18	SK8367981162
OW3	SK8875291182	OW19	SK8335581013
OW4	SK8927989334	OW20	SK8287980943
OW5	SK8944189143	OW21	SK8263380914
OW6	SK8954688629	OW22	SK8252680886
OW7	SK8978087947	OW23	SK8214480716
OW8	SK9000387498	OW24	SK8207980689
OW9	SK9034386877	OW25	SK8139980627
OW10	SK9046485461	OW26	SK8069680288
OW11	SK9037985029	OW27	SK8046879842
OW12	SK9022784498	OW28	SK8052479409
OW13	SK8983384375	OW29	SK8124378685
OW14	SK8930584143		



Legend

- Site boundary
- Internal Drainage Districts - Extended Area
- Internal Drainage Districts
- Shared cable corridor and access
- High voltage cable corridor and access
- Cable route
- Statutory Main Rivers
- Linear watercourse
- Ordinary Watercourse (LLFA)
- Statutory Main River (EA)



Figure	Cable Route Crossings		
Job	Cottam		
Client	Island Green Power		
Figure No.	1	Revision	A
		Date	04/11/2022
Drawn	BB	Checked	JR
		Scale	1:70,000 @ A3
Job No.	21-1088.01		Central GR
			485466E 387794N