Proposed Solar PV Development

Byers Gill Solar
EN010139

8.40 Impacts of Updated Flood Maps

Planning Act 2008

APFP Regulation 5(2)(q)

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Volume 8

Response to the Secretary of States Request for Information – 3 June 2025

Revision C01

RWE
14 Bird Street
London
W1U 1BU
United Kingdom
www.rwe.com

Byers Gill Solar
EN010139

Technical Note

Impacts of Updated Flood Maps

1. Introduction

1.1. Background

1.1.1. Wallingford HydroSolutions Ltd (WHS) has been commissioned on behalf of RWE (the Applicant) to review the Environment Agency's (EA) updated national flood risk maps and Flood Map for Planning and advise whether these have any implications on the conclusions of the Environmental Statement Chapter 10 [APP-033] and the Flood Risk Assessment and Drainage Strategy [REP8-019] for the Proposed Development.

1.1.2. This note details the findings of the review and concludes whether the Proposed Development will be impacted.

1.2. Data Sources

1.2.1. The key data sources used to inform this assessment are:

- EA Flood Map for Planning [1]
- EA Long Term Flood Risk – Surface Water Map [2]

2. Fluvial Flood Risk

2.1.1. The updated EA Flood Map for Planning [1] indicates the Proposed Development remains largely situated within Flood Zone 1. Fields D02 and F01 are still partially located within Flood Zone 2 and 3 associated with the Little Stainton Beck and the Bishopton Beck respectively. Flood Zone 3 is defined as an area having more than a 1.0% annual exceedance probability (AEP) of flooding from main rivers.

2.1.2. The old and new flood map in the vicinity of field D02 is shown in Figure 1. The extent of flooding shown in the updated map has reduced and aligns better with the location of the Little Stainton Beck. Due to the inaccurately displayed flood risk in the old map, a bespoke detailed hydraulic model of the Little Stainton Beck was developed and used to inform the Flood Risk Assessment and Drainage Strategy [REP8-019]. This was used to determine that the solar PV modules were sufficiently raised. As a detailed hydraulic model was used, the change in flood map here does not impact the conclusions of the Environmental Statement Chapter 10 [APP-033].

Figure 1 - Field D02 Flood Map for Planning before (left) and after (right)

2.1.3. The old and new flood maps in the vicinity of field F01 are shown in Figure 2. The extent has not changed significantly and therefore the Proposed Development will not be impacted because the solar PV modules do not encroach on it. An access track and crossing are proposed at this location, but it will be at grade and utilise an existing bridge crossing. Therefore, the installation of an access track will not impact the existing flood risk. Further to the northeast, Flood Zones 2 and 3 encroach on the Order Limits. However, no infrastructure or ground raising is proposed within these areas therefore there would be no impact here.

2.1.4. Figure 2 shows where the Order Limit crosses Flood Zones 2 and 3 just northeast and east of panel area E03. This has been refined in the new flood maps and includes a smaller tributary to the east running alongside the Order Limits. This part of the Order Limits covers the location of existing access route crossings to be used and underground cable routes. As stated in the Flood Risk Assessment and Drainage

Strategy [REP8-019], no changes are proposed to existing access routes and crossings. As the cables will pass underneath the waterbodies, they will not impact upon floodplain storage and no ground raising or above ground crossings are proposed. Therefore, the change in flood maps at these locations does not impact the conclusions of the Environmental Statement Chapter 10 [APP-033].

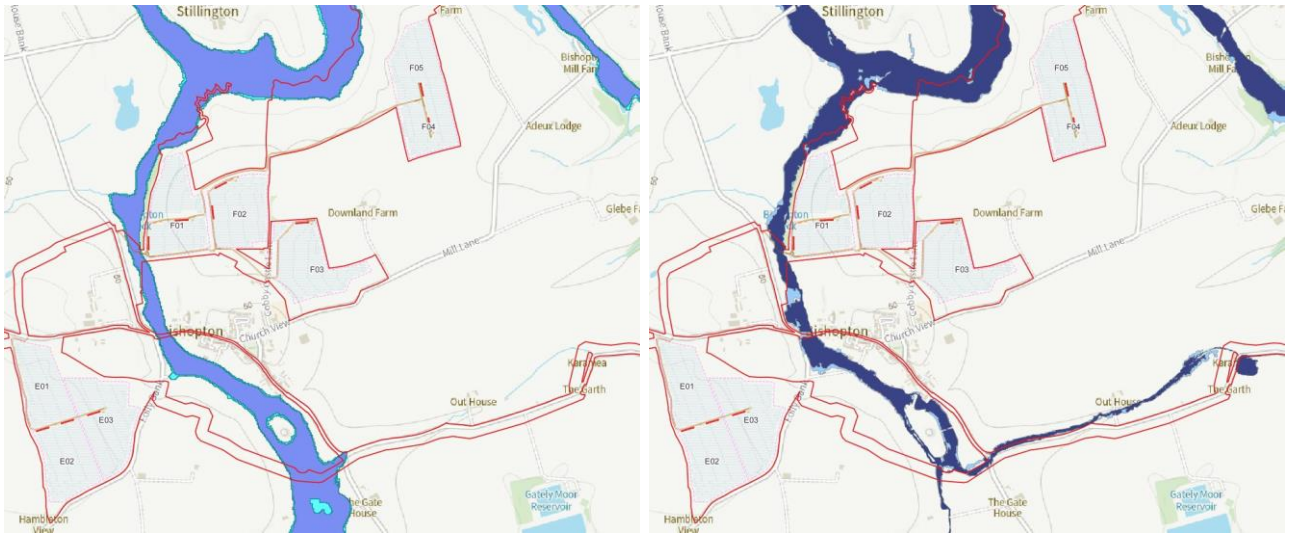

Figure 2 - Field F01 Flood Map for Planning before (left) and after (right)

2.1.5. The old and new flood maps in the vicinity of Carlton Village are shown in Figure 3. This part of the Order Limits covers the location of existing access route crossings to be used and underground cable routes. The updated flood maps have reduced in extent on the road through Carlton but an increased extent south of the village. As with the areas flagged in section 2.1.4, no changes are proposed to the existing access routes and no ground raising. Therefore, the change in flood maps at these locations does not impact the conclusions of the Environmental Statement Chapter 10 [APP-033].

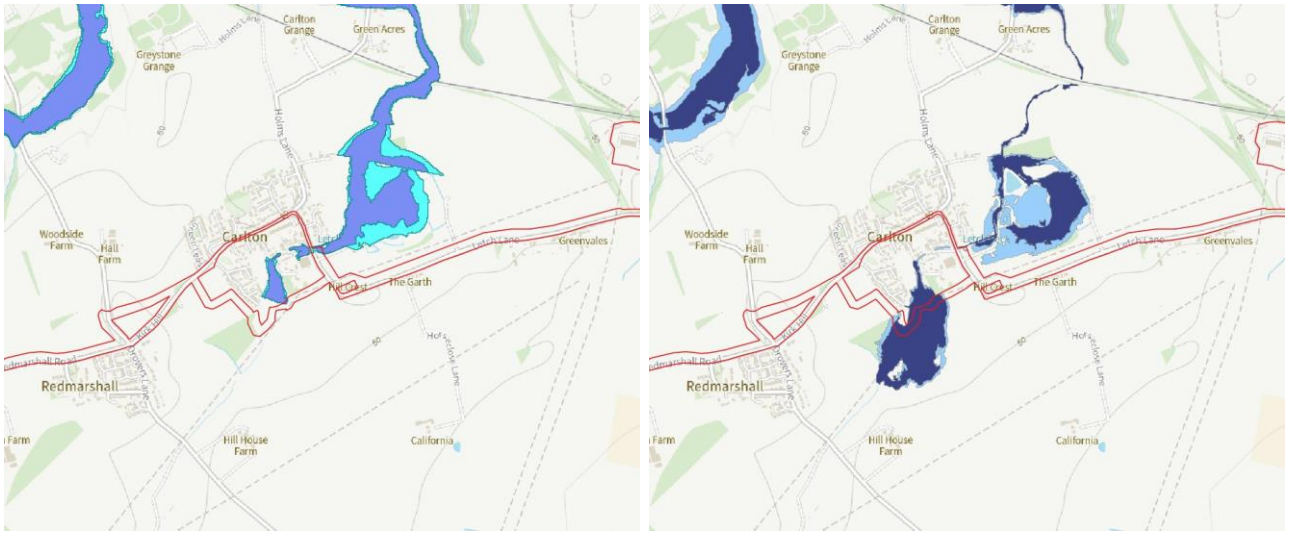

Figure 3 – Carlton Village Flood Map for Planning before (left) and after (right)

3. Surface Water and Minor Watercourse Flood Risk

3.1.1. A review of the updated EA surface water flood risk map [2] indicates that the majority of the Proposed Development remains at low risk of surface water flooding, with a chance of flooding of less than 0.1% AEP across the majority of the Order Limits. The new map includes a version with a climate change allowance applied therefore this scenario has been reviewed and presented in this note. When compared with the old flood maps, no critical infrastructure had been placed within the 0.1% AEP surface water flood zone. In the updated maps the vast majority of infrastructures remains outside of this zone, however a small number of inverters and the substation are now partly within it on the edge of overland flow routes or areas of localised pooling. These are located in Panel Areas B, C and D. A comparison between the old and new flood map can be seen in Figure 4, Figure 5 and Figure 6. In total 4 inverters (out of up to 44), 8 hybrid inverters (out of up to 53) and the substation are partly in the updated 0.1% AEP surface water flood zone.

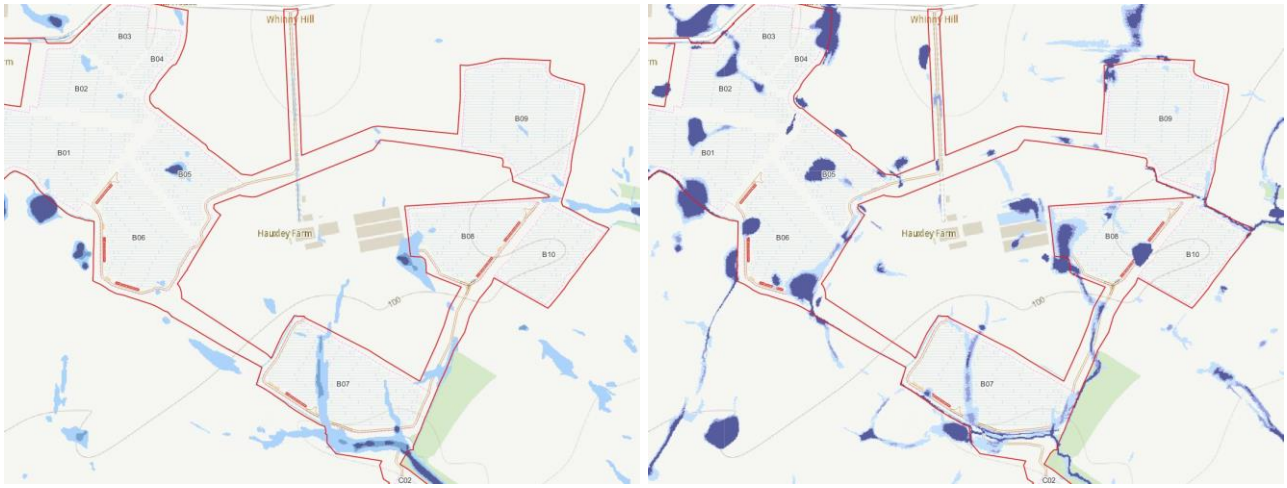

Figure 4 – Panel Area B Surface Water Flood Map before (left) and after (right)

Figure 5 – Panel Area C Surface Water Flood Map before (left) and after (right)

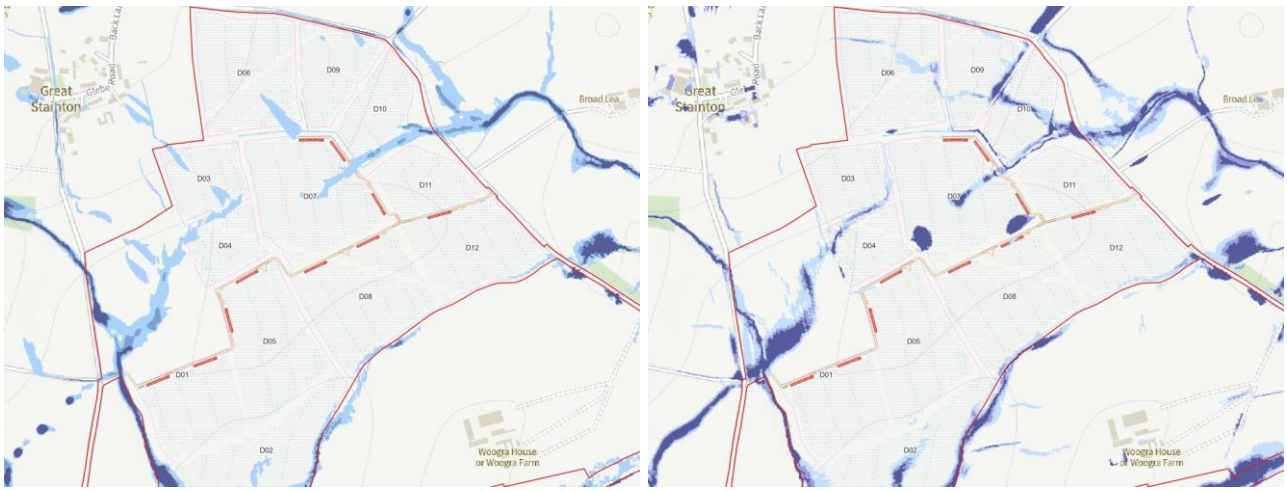

Figure 6 - Panel Area D Surface Water Flood Map before (left) and after (right)

3.1.2. The surface water flood maps also show the chance of flooding for specific depth bands including 200mm, 300mm, 600mm and 900mm. The inverters identified as being at risk largely do not show as having a 0.1% AEP for a 200mm flood depth, but where they do, they do not show as having a 0.1% AEP for a 300mm flood depth. Figure 7 shows this for Panel Area C as an example. This demonstrates that the identified inverters are associated with relatively shallow flood depths up to 300mm. As part of the detailed design process (Requirement 3 of the draft DCO), it is proposed to micro site the inverters so that they sit outside of areas at risk and this review has confirmed that micro-siting in these locations is achievable.

3.1.3. Figure 7 also shows that in the updated maps the substation is in an area at risk for the 0.1% AEP scenario for a 200mm flood depth, but not for 300mm. This demonstrates that the maximum flood depth predicted for this design event is between 200mm and 300mm. This is very shallow and associated with an overland flow route adjacent to an existing field drain. To mitigate this risk, it is considered that a suitably designed sustainable drainage solution, for example a swale, can be developed as part of the detailed design process to route and/or store surface water around the substation without significantly impacting the hydraulic regime. As per Requirement 3 Detailed Design of the DCO [REP9-006], details of drainage are to be submitted and approved by the Local Planning Authority prior to commencement, in accordance with the Design Approach Document [REP8-022].

Figure 7 - Panel Area C Surface Water Flood Map for 200mm depth (left) and 300mm depth (right)

3.1.4. Solar PV modules will by default be raised 800mm above the ground at the toe, allowing overland flow routes to operate as normal. In the Flood Risk Assessment and Drainage Strategy [REP8-019] it was confirmed that the raising was sufficient by reviewing the surface water flood map depths for the 1.0% AEP scenario. This has been done again using the updated surface water flood maps. Table 3-1 highlights the fields within Panel Areas that have the most notable surface water flood risk spots and the maximum depth (200mm, 300mm, 600mm or 900mm) at which it is shown to be at risk for the 1.0% AEP scenario.

Table 3-1 Surface water flood depth bands

Panel Area	Field	1.0% AEP depth band
Panel Area A	▪ A12	▪ 300mm
	▪ A17 and A21	▪ 600mm
Panel Area B	▪ B01 to B06	▪ 300mm
Panel Area C	▪ C02 and C05	▪ 300mm
	▪ C06	▪ 300mm
Panel Area D	▪ D02	▪ 200mm
	▪ D07	▪ 300mm
Panel Area E	▪ E01	▪ 900mm
Panel Area F	▪ F03	▪ 300mm

3.1.5. The majority of the highlighted areas show flood depths less than 800mm which means the solar PV modules are still suitably raised when compared against the updated surface water flood map. When compared with the old maps, field D02 and C06

showed depths greater than 800mm, however the former showed fluvial flood risk which was assessed using the detailed hydraulic model and the latter was determined to be incorrect by reviewing the latest LiDAR data. The updated surface water flood map now reflects this.

3.1.6. Field E01 is the only field identified as having PV modules partly within an area where flood depths at 900mm would occur for the 1.0% AEP design event. Using the old flood maps, this was estimated to be up to 600mm. Approximately 340m^2 of PV modules are in this zone in the northern corner of Field E01. This is a very small proportion of the total PV module area within Field E01, approximately 1%. Therefore, it is proposed at detailed design to review this risk and locally raise these PV modules to bring them above the predicted flood level. As per Requirement 3 Detailed Design of the DCO [REP9-006], details of the scale of the Proposed Development are to be submitted and approved by the Local Planning Authority prior to commencement, in accordance with the Design Approach Document (DAD) [REP8-022]. The DAD sets out the parameters of the scale of the PV panels to a maximum height of 3.5m. It is considered that there is sufficient flexibility to enable the PV panels to be raised above the predicted flood level within this maximum height.

4. Conclusions

4.1.1. This note outlines the review undertaken of the updated EA national scale flood maps to understand whether these impact upon the conclusions of the Environmental Statement Chapter 10 [APP-033] and the Flood Risk Assessment and Drainage Strategy [REP8-019]. The following bullet points summarise the results and conclusions of this assessment.

- There have been minor changes to the Flood Map for Planning and the associated fluvial flood risk but these do not impact the Proposed Development and the conclusions made in the Environmental Statement Chapter 10 [APP-033] and the Flood Risk Assessment and Drainage Strategy [REP8-019] remain unchanged.
- The updated surface water flood maps are more refined, include an allowance for climate change and reflect the latest national scale topography data. The solar PV modules will be raised by 800mm and a review of the predicted flood depths in the field areas show that this remains sufficient to prevent the vast majority panels being submerged for return periods up to and including the 1.0% AEP design event. The exception is small area of PV modules in the northern corner of Field E01. It is proposed at detailed design to review this risk and locally raise these PV modules within the maximum height parameter of 3.5m to bring them above the predicted flood level.
- 4 inverters and 8 hybrid inverters are shown to be partly within surface water flood risk areas where they were not before. These are associated with shallow flood depths up to 300mm for the 0.1% AEP design event. It is proposed to microsite the inverters and hybrid inverters at the detailed design stage to locate these outsides of the updated flood zones.
- The substation is also now shown to be within a shallow are of surface water flooding (between 200mm and 300mm) and associated with an overland flow route adjacent to an existing field drain. A sustainable drainage solution (e.g. a Swale) will be designed at the detailed design stage to store and/or route the overland flow route around the substation and mitigate the flood risk within it.

References

[1] Environment Agency, "Flood Map for Planning," 2025. [Online]. Available: https://flood-map-for-planning.service.gov.uk/map. [Accessed 29 May 2025].

[2] Environment Agency, "Long Term Floof Risk - Surface Water Map," 2025. [Online]. Available: https://check-long-term-flood-risk.service.gov.uk/map. [Accessed 29 May 2025].