Environment Agency

Planning Inspectorate

[via Planning Inspectorate website &
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]

Our ref: XA/2025/100428/03
Alt Ref: ENVPAC/1/NIT/00019
Your Ref: EN010159

Date: 03 December 2025

Dear Sir/Madam

ONE EARTH SOLAR FARM

RESPONSE TO EXAMINING AUTHORITY'S WRITTEN QUESTIONS 3

Thank you for consulting us on the examining authority's written questions 3. We have reviewed the questions directed at the Environment Agency and responded to them below.

We trust this advice is useful.

Yours sincerely

[redacted]
Planning Advisor - National Infrastructure Team

Appendix 1 – Response to Examining Authorities Written Questions 3

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Appendix 1

ExQ3	Question to:	Question:
Q5.0.1	EA	**Application of the Mitigation Hierarchy** In undertaking an application through the Planning Act, which is recognised as EIA development, both the EIA Regulations and the NPS expect the applicant to undertake a consideration of alternatives having followed the mitigation hierarchy. In light of the ongoing debate with regard to the suitability of the sequential test. Can all parties present the evidence they would wish the ExA to consider in deciding how the mitigation hierarchy has been applied to avoid, reduce, mitigate or compensate for any adverse impacts.
Environment Agency Response:		
The Environment Agency would not normally comment on the suitability of the wider sequential test and site selection and would defer to the position of the respective Local Planning Authority on this matter. Within the site itself sensitive infrastructure such as the Battery Energy Storage System, has been sequentially sited outside of the design and credible maximum flood extents. The applicant has committed to raising solar panels and inverter stations above the design flood level and the applicant has avoided built aspects of the development within the functional floodplain (Flood Zone 3b)		

ExQ3	Question to:	Question:
Q7.0.1	EA	**Adequacy of fish assessment** 1) In light of the outstanding matters in the latest iteration of the draft SoCG can both parties advise on their position and how you anticipate the differences between you can be resolved. 2) In the event the matters remain in dispute can the EA advise how either a requirement or management plan might be adjusted to provide appropriate mitigation to ensure the relevant species are appropriately protected.
Environment Agency Response:		
The current statement regarding the duration of drilling lacks sufficient specificity. It notes that “trenchless crossings of the River Trent will take a number of weeks to complete, although the time of active drilling beneath the river bed is likely to be measured in days.” We agree that if the active drilling period is genuinely limited to a few days, then noise-related impacts on fish are likely to be insignificant in Environmental Impact Assessment (EIA) terms. However, we expect that when undertake the works, the applicant will provide a more detailed temporal breakdown of the activities. Should the permitting assessment determine that the duration or timing of the works poses a risk to fish populations in the River Trent, particularly salmonid species, the applicant should		

anticipate that a timing condition may be imposed on the permit to mitigate such risks.

Whilst impacts on Atlantic salmon have not been specifically mentioned in the assessment of likely significant effect, they have addressed fish in general. And as a result, the mitigation that is being proposed for fish is also acceptable mitigation for salmonids.

We are pleased that the legislation has been updated to include the Salmon and Freshwater Fisheries Act 1975 and Eel Regs 2009. Overall, we have no further comments to make.

ExQ3	Question to:	Question:
Q12.0.1	EA	**Additional Submissions** The ExA has decided to accept two additional submissions [AS-061 and AS-062] from Mr Fox which have been published on the infrastructure website for the examination. 1) Can each party set out a detailed response to all matters in each document.

Environment Agency Response:

Quantified Static Loss

With respect to the quantified static loss and the calculation of 39,900 cubic metres (m3). This calculation is based on an area of 700 hectares and an increase in level of 5.7mm. An area of 700 hectares reflects the area of the red line boundary for the development that intersects Flood Zone 2 and 3 but it is important to note that not all the red line boundary includes developed areas or built elements.
The area of solar panels which fall within Flood Zone 3 (1 in 100-year undefended extent) equates to 415 hectares. The area of solar panels which fall within both Flood Zone 3 and Flood Zone 2 (1 in 1000-year undefended extent) equates to 504 hectares. As the development is classed as essential infrastructure the applicant should use the higher central allowance to design the development. In most cases the central climate change allowance should be used for assessing offsite impacts except where the area contains essential infrastructure in which case the higher central allowance should be used (Flood risk assessments: climate change allowances - GOV.UK).

In this case as the development has a design life of 60 years the 2080s time horizon (epoch) should be used which constitutes an uplift of plus 39% for the higher central scenario. The design event for the development is therefore the 1 in 100 year plus 39% climate change scenario and the applicant should design to and mitigate for this scenario. The total area of solar panels which fall within the design flood extent is 463 hectares comprising 181 hectares in the western floodplain and 282 hectares in the eastern floodplain.

In terms of assessing the impact of the solar panel support frames the applicant's volumetric assessment divides the floodplain up into eastern and western floodplains rather than combining the two estimated levels of 2.2mm and 3.5mm to give 5.7mm. The EA consider this approach reasonable as outlined in our response to documents submitted at deadline 4 dated 12 November 2025 (document library reference:

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REP5-082) given the difference in timing of inundation and maximum water levels between the eastern and western floodplains. These two floodplains act independently as illustrated by the maps in figure 1 and 2 below which show the maximum flood level and timing for when maximum flood levels are reached during the design flood event in the vicinity of the proposed development. Water levels on the eastern Trent floodplain reach their maximum earlier than water levels on the western Trent floodplain in the design event. On the eastern floodplain water levels reach their maximum between 82 and 116 hours into the design event simulation and reach a peak level of between 6.2 and 6.9 metres Above Ordnance Datum (mAOD). On the western floodplain maximum levels are reached at around 127 hours and reach a peak level of just over 7 mAOD.

Figure 1. Peak design event (1 in 100 year plus 39% climate change) water level for the River Trent in the vicinity of the proposed development. Water levels are shown in metres Above Ordnance Datum (mAOD). Levels are taken from the Tidal Trent hydraulic model (Jacobs, 2023)

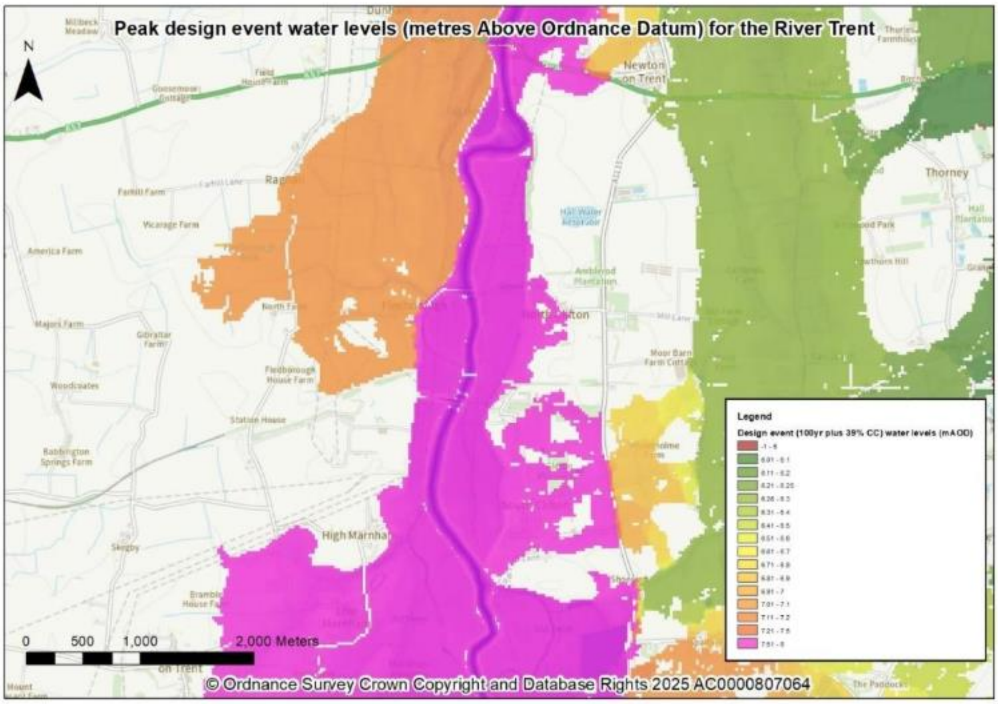
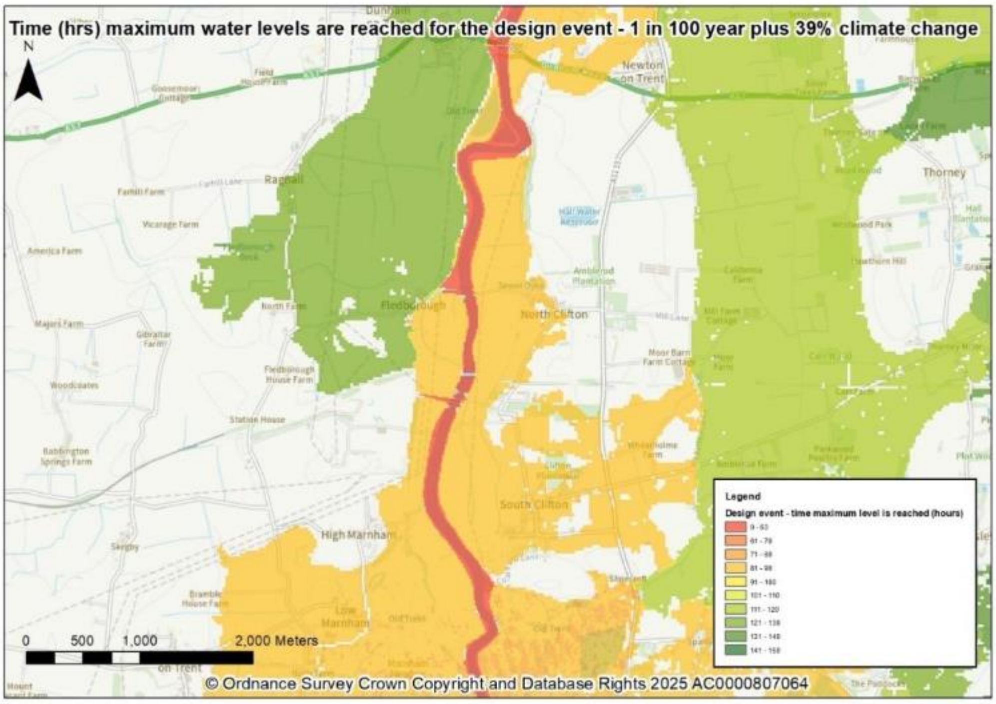


Figure 2: Time (hrs) when maximum water level is reached for the eastern and western floodplains on the River Trent in the vicinity of the proposed development for the design event (1 in 100 year plus 39% climate change). Timings are based on the Tidal Trent hydraulic model (Jacobs, 2023)

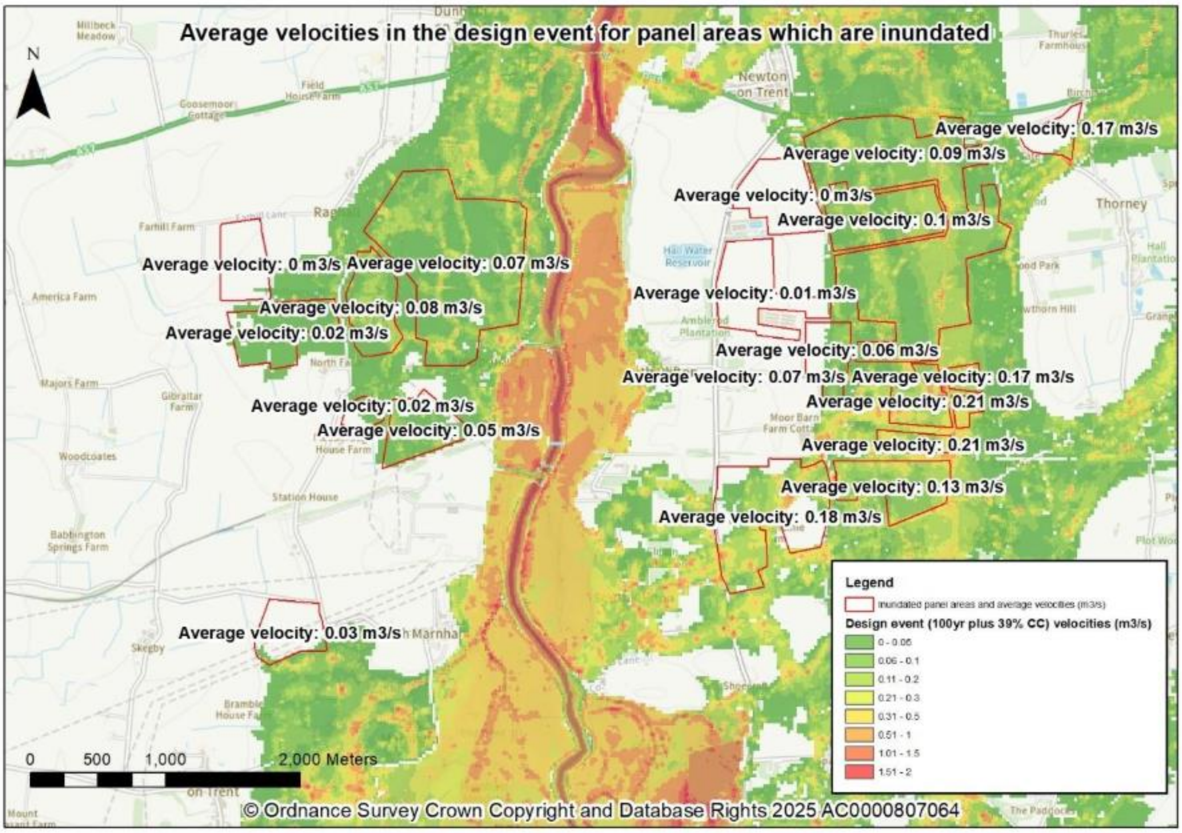


Level for level compensation

It would be technically difficult to provide effective level for level compensation for the solar panel support columns themselves as the support columns are disparately spread across the floodplain. Compensatory storage is not something that is typically asked for in cases where development is raised on stilts, like solar panels or voided structures. The EA take the view that water should be able to move freely below solar panel column supports and the impact on flood risk would be negligible in most cases. Scrapes could in theory be provided at certain locations within the development, but this would not constitute level for level compensation.

In some cases, panel frames can pose a blockage risk and impede flood flows, however, in the case of One Earth Solar farm the solar panel areas only start to become inundated in the 1% (1 in 100) annual exceedance probability plus climate change scenarios and the respective peak velocities in the panel areas are low generally being around 0.1 metres per second or less (figure 3). On this basis we do not believe blockage risk is a significant issue for this development. Flow velocities are higher in the area of functional floodplain for the River Trent which is defined as the 3.3% (1 in 30 year) extent and where recent historical floods have been observed such as flooding in November 2000, February 2020 (Storm Dennis), October 2023 (Storm Babet) and January 2024 (Storm Henk) although the applicant does not propose any development in these areas.

Figure 3: Average velocities for each solar panel area for the design event (1 in 100 year plus 39% climate change). NOTE: The colour shaded grid shows the peak velocities in metres per second (m/s) across the floodplain during the design event. The values shown for the solar panel areas reflect the average of these peak values sampled to the solar panel areas



<u>Hydraulic modelling of the impact of solar panel support columns</u>

There are no prescribed methods in Environment Agency guidance or wider scientific literature on how to assess the hydraulic impacts of solar panel support frames on flood risk within floodplains. Volumetric and/or modelling approaches can be used but both carry limitations and some uncertainties.

It is difficult to represent solar panel columns explicitly in hydraulic models for rivers due to their small size. Small scale detailed two dimensional (2d) or three dimensional (3d) hydraulic models can be developed but the run times for such models can become prohibitively long or impractical when such modelling is undertaken for large floodplains. Proxy approaches can be taken within hydraulic models to try and understand the effect of columns or posts in the floodplain on flood risk. Manning's roughness values for the floodplain can be increased to mimic the effect of increased frictional losses from posts. Chow (1959) provides some suggested values for different land use types in floodplain. The suggested values for trees in floodplains (for example a Mannings roughness of 0.08 to 0.12) could be used to approximate the impact of support columns. It should be noted however that such an approach requires the subjective selection of an appropriate mannings roughness value to approximate the effect of the solar panel support columns on flood flows. This carries uncertainty. Additionally, the increase in roughness would not replicate any effects from loss of flood storage within the hydraulic model.

In contrast to increasing Mannings roughness within a hydraulic model, another approach which can be used in 2 dimensional hydraulic models is the use of flow constriction layers and storage reduction factors (Tuflow, 2025). These allow prescribed blockage values and reductions in 2d grid cell storage to be applied to the hydraulic model. The advantage of the flow constriction and storage reduction factor approach over the increased Mannings roughness approach is that it requires less subjective interpretation. If solar panel support column spacing and dimensions are known with respect to unit area, then it is possible to calculate appropriate blockage values to apply to the flow constriction and storage reduction factor layers within the hydraulic model.

In addition to the volumetric calculations, we have asked the applicant to undertake modelling using the flow constriction and storage reduction factor approach using the Tidal Trent hydraulic model (Jacobs, 2023). We have reviewed the hydraulic model files and consider the approach taken broadly reasonable although we have some questions regarding leg dimensions and spacing which we have asked the applicant to clarify in their Flood Risk Assessment. The EA understand that the outputs from this modelling and detail on the approach should be submitted at the next deadline (deadline 6 3rd December 2025). This modelling shows limited impact from the solar panel support frames themselves during the design event (1 in 100 year plus 39% climate change scenario) with some localised increases of 1mm to 3mm. There are no changes in water levels within the River Trent upstream or downstream of the development.

In terms of whether any increase is an observable increase or attributable to model precision or calculation limitations, there is currently no absolute value given in existing guidance on what an acceptable model tolerance is, as this will vary between models and locations. A figure of +/- 10mm has historically been considered a reasonable “rule-of-thumb” for a calculation tolerance as this relates to the water level convergence threshold, which is used in some hydraulic modelling software packages such as Flood Modeller, which is used in the Tidal Trent (2023) modelling. However, The EA have moved away from a specified model tolerance threshold in more recent guidance (Environment Agency, 2023). Some level of precision and judgement does however have to be considered when interpreting model results, particularly where changes are marginal, disconnected, or related to model limitations and instabilities.

In this case we discussed a 5mm tolerance as a starting point nothing the conservative parameters for which the applicant has used in their volumetric assessment although it should be noted that the assessed changes in water level from the volumetric calculations and hydraulic modelling are less than this

Exponential Kinetic Failure

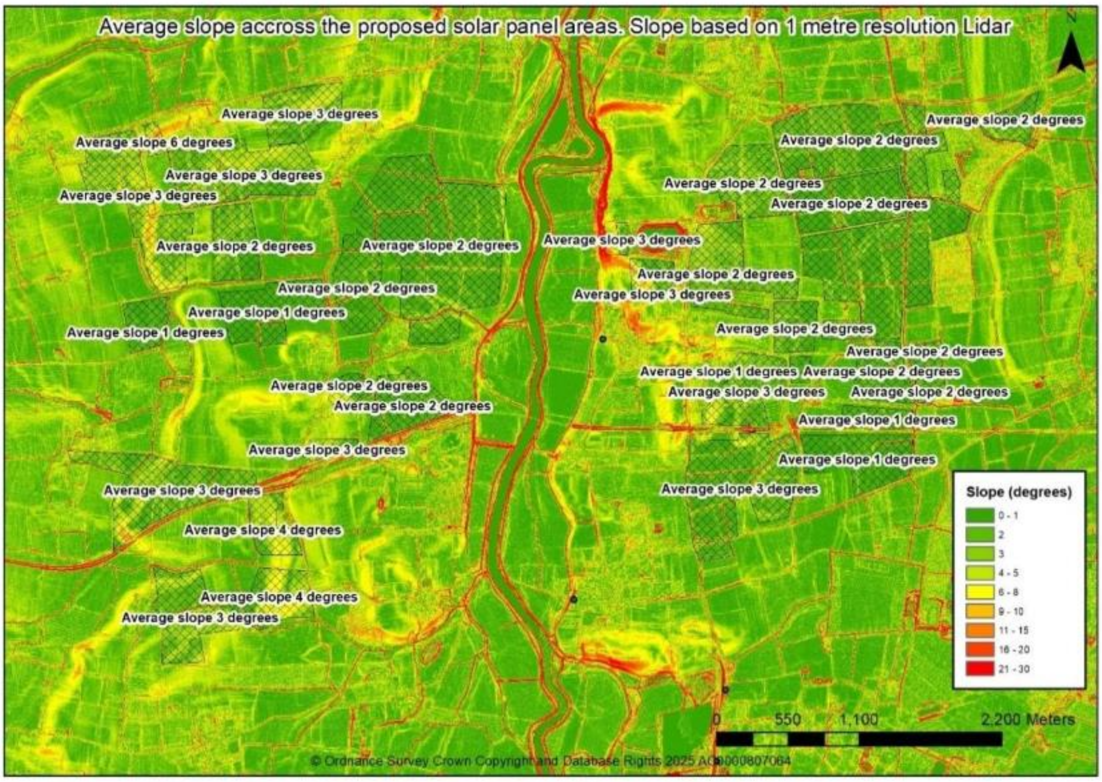
From a flood risk perspective, we would defer to the respective Lead Local Flood Authorities position with respect to surface water runoff and the management of surface water runoff from the built aspects of the development. For surface water drainage, the Environment Agency review aspects relating to surface water quality and groundwater protection rather than flood risk however we outline our position regarding surface water runoff, the impact on erosion, fluvial flood risk, and cumulative impacts in the sections below.

Impact of runoff generation on soil erosion and the degradation of water quality.

We note the influence of solar panels on runoff and soil erosion is complicated and there is varying evidence in the scientific literature. For example, whilst research from Biamonte *et al* (2023) suggests an increase in peak discharge rate and a reduction in time to peak, research by Wang and Gau (2023) showed reduced soil erosion and total runoff when compared to a control slope without a solar PV panel. It should be noted that in both these cases the “with solar panel” and control slopes were on bare earth rather than on vegetated land. Almost all the research points to the maintenance of healthy vegetation as important (Bajehbaj *et al* 2024, Biamonte *et al* 2023, Wang and Gao 2023, Cook and McCuen 2013), particularly in the vicinity of the drip line and space between panel areas. Bajehbaj *et at* (2024) however notes that in some cases vegetation cover alone may not be sufficient for storm water management, particularly in areas most prone to runoff generation in undisturbed conditions and where slopes are steep and soil drainage is poor. In the case of the proposed One Earth Development the slope for where solar panels are proposed is shallow, generally being in the range of 1 to 4 degrees (figure 4) although we note some isolated panel areas where slope is higher (5 to 10 degrees), for example an area of around 3 hectares just to the south west of Hall Water Reservoir at grid reference 482465, 372625. Given the relatively shallow gradient for the areas where the solar panels are proposed we would expect surface water runoff velocities to be low as well as any associated soil erosion and sediment load. The Risk of Flooding from Surface Water with climate change speed dataset also indicates low velocities across the study area (Environment Agency, 2025a). We appreciate that this is a qualitative assessment rather than a quantitative assessment based on detailed direct rainfall (rain on grid) hydraulic modelling with the solar panels in place, but in the context of runoff and soil erosion, such modelling is not typically undertaken in planning applications for solar farms within England.

The latest Flood Risk Assessment dated November 2025 (document library reference: REP5-028) suggests strategic Sustainable Drainage Systems (SuDs) such as filter drains, swales, and basin scrapes but no specific design detail is provided at this stage. Measures to prevent the deposition of fine sediment, such as silt fencing, are secured in the oCEMP (REP5-032) and oDEMP (REP5-036). Furthermore, SuDS are committed in the oOEMP (REP5-034) to be incorporated wherever possible within the solar development, to provide multi-functional benefits associated with water quality. Considering the maintenance of vegetation, use of strategic SUDs features, and relatively low slope within the solar panel areas the EA consider that any increased runoff and soil erosion could be feasibly mitigated for from a development of this nature, although we would defer to the respective Lead Local Flood Authorities position on the management of runoff from the development.

Figure 4: Slope in degrees in the vicinity of the proposed development based of 1 metre horizontal resolution Light Detection and Ranging (Lidar) data dated 2022



Changing land use and the impact on runoff generation and river (fluvial) flood risk

In terms of the impact of changing land use on runoff and incorporating this into any "with development" fluvial hydraulic modelling for the River Trent, the Environment Agency works on the assumption that new development will have no detrimental impact on surface runoff as the purpose of SuDs is to mitigate runoff to greenfield runoff rates. This is a core principle of all new development and as such we would not normally require applicants to update river (fluvial) hydrological calculations to account for new development on the assumption that run-off would be limited to greenfield rates.

Cumulative effects in the Trent catchment

In terms of the cumulative impacts in terms of runoff generation and increases in fluvial (river) flood risk, we would not recommend a catchment wide fully distributed model to assess fluvial flood risk from the River Trent. Such modelling would be technically challenging and would introduce additional uncertainties, particularly when undertaken at the catchment scale. Provided that the localised impact of runoff is not increased, by extension the cumulative impact at the catchment scale should remain unchanged. While minor shifts in phase and timing may occur, the complexity of assessing these across a large catchment is beyond the capabilities of many hydrological methods, such as those outlined in the Flood Estimation Handbook, to predict. Even fully distributed modelling approaches carry uncertainties and limitations particularly when considering cumulative impacts at the large catchment scale.

The current hydraulic model of the tidal River Trent (2023) incorporates a detailed hydrological assessment which uses over 100 years of flow data record at Nottingham (dating back to 1884). The model covers the full extent of the tidal River Trent from Winthorpe Bridge just downstream of Newark (upstream of tidal limit at Cromwell) and extends to its confluence with the Humber Estuary at Trent Falls. The model also includes the Fosse Dyke to Lincoln. All areas of River Trent channel and floodplain are included. The river channel itself is represented in 1d using Flood Modeller software and the floodplain is represented using Tuflow 2-dimensional modelling software. The model was calibrated across 6 historical flood events (January 2005, November 2011 November 2013, December 2013, January 2014, and December 2015) at the Carlton on Trent, Gainsborough, and Keadby gauges. Calibration performance was good for the fluvial events. A comparison against recorded flood extents was also undertaken for the November 2000 event (largest event on record at the North Muskham gauge – CEH, 2025), November 2012, and December 2013 events (tidal surge event). The 2023 model built on previous modelling undertaken by Mott Macdonald in 2014. The previous 2014 modelling was calibrated against the November 2000 event, January 2005 event, June 2007 event, November 2011 event, July 2012, and November 2012 events.

A fully distributed "rain on grid" model, for example using SHETRAN, would require the use of direct rainfall potentially over a very large catchment area. For example, the catchment for the River Trent to the proposed development is over 8,200km^2. This could potentially be broken down and reduced further by amalgamating different model types, but this could introduce further uncertainties. The assumptions of spatially uniform rainfall break down over catchment areas greater than 1000 km^2 (Environment Agency, 2025b) so this would require the use of a rainfall generator and some form of continuous simulation to produce the "design flood event" for the development. This would produce a significant amount of data and result in very long simulation durations. This would be a technically challenging approach to take and would still carry uncertainties and may introduce new uncertainties over and

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above those within the current approaches . We believe this would not add any value to the assessment of fluvial flood risk using the current Tidal Trent (Jacobs, 2023) hydraulic modelling or to the assessment of cumulative impacts more widely.

A localised 2d direct rainfall model could be an approach to understand runoff from the panel areas and design SuDs accordingly to mitigate any runoff but again this is not something that we would typically ask for as the Environment Agency and note the applicant has adopted approaches similar to other applications in terms of surface water runoff, fluvial flood risk, and cumulative effects.

More widely, with respect to the Tollerton Airfield site and contamination pathways, this site is within the Trent catchment but is over 40 kilometres to the southwest of the proposed development site. The average elevation in metres Above Ordnance Datum (mAOD) for the One Earth development is 10 mAOD with minimum and maximum elevations being in the range of 2.6mAOD to 26mAOD. Tollerton Airfield is above 26mAOD. In terms of runoff from the solar farm development, we would defer to the respective Lead Local Flood Authorities position on this. However, notwithstanding the fact that new development should not increase runoff, we do not believe there is a clear pathway for runoff from this development or any other solar developments within the Trent corridor to the Tollerton Airfield site on the basis that these are at a lower elevation and downstream of the Tollerton site. There are no clear pollutant pathways from the proposed development to the Tollerton Airfield site.

Groundwater Resource Impact and Contamination Risk

In Part V.1. of AS-061 the underlying bedrock aquifer is described as a ‘high sensitivity groundwater body’. The bedrock underlying the site is largely classified as Secondary B Aquifer (associated with Mercia Mudstone Group), with localised areas classified as Secondary (undifferentiated) (Penarth Group mudstone and dolomitic siltstone). As described in Protect groundwater and prevent groundwater pollution (Environment Agency, 2025c), Secondary B aquifers are mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (fissures) and openings or eroded layers. Secondary (undifferentiated) aquifers are unable to be assigned Secondary A or B definitions due to variable characteristics and are considered to have minor value. The bedrock is overlain locally by superficial deposits which are mainly classified as Secondary A and Secondary (undifferentiated) aquifers.

Part V.1 of AS-061 raises concerns about the deterioration of the on-site groundwater body status and Drinking Water Protected Areas and public supply. It should be noted that while most of the site lies within a Drinking Water Surface Water Protected Area, there is no current Drinking Water Groundwater Safeguard Zone designation applicable to any part of the site.

The Applicant has stated that installation of the solar arrays would involve the driving of metal piles to maximum depths of 3.0 metres below ground level. We do not consider this activity to represent a significant risk to groundwater quality as:

- The Preliminary Risk Assessment carried out by the Applicant (APP-099 to APP-104) has identified no current significant sources of contamination with the exception of High Marnham Power Station and its associated landfill, which are to be subject to ground investigation post-consent and remediation where required as secured by the draft DCO (REP5-006 Requirement 21);
- A Discovery Protocol for unexpected contamination has been secured in the outline CEMP (REP5-034), which will ensure that any contamination which

may be encountered during groundworks, such as in areas of historic mineral extraction, will be managed;

- Local borehole records held by the British Geological Survey (BGS) (British Geological Survey, 2025) typically show the presence of granular superficial deposits overlying the bedrock aquifers (e.g. BGS borehole references SK87SW9, SK87SW15, SK87SW12, SK87SW20). These are typically permeable, meaning the introduction of narrow piled structures to a depth of 3.0m is unlikely to result in the creation of new pathways to the bedrock.
- No significant sources of mobile contamination are anticipated to be introduced associated with the operation of the solar panel arrays.

At this time the Applicant has not produced any Hydrogeological Impact Assessments for the Proposed Development. As stated in Table 3.5 of the outline CEMP (REP5-034) these will be produced at the detailed design stage for river/watercourse crossings. As set out in Environment Agency guidance 'Preparing a hydrogeological impact assessment' (Environment Agency, 2025d), all Hydrogeological Risk Assessments must be carried out by someone who either holds an appropriate accreditation or is working towards an appropriate accreditation under the supervision of an accredited industry professional. We do not consider the production of a Hydrogeological Risk Assessment to be necessary for the shallow piled solar panel arrays.

The Anglian Water public groundwater abstraction boreholes are all situated over 500m from the Proposed Development site boundary, with the site also lying outside the designated groundwater Source Protection Zones for these abstractions.
We understand the impacts to the Anglian Water and Severn Trent distribution mains as identified in Table 7.4 relate to water supply availability rather than potential groundwater quality or quantity impacts. Sections 7.6.27 and 7.6.51 of Chapter 7 of the Environmental Statement confirms that the Applicant has submitted a Water Resources Assessment to Anglian Water and have received confirmation that there is capacity within the existing mains to supply the development with domestic, welfare and non-domestic water during the construction and operation phases.

It should be noted that the impact severity ('nature of effect') stated in Table 7.4 of Chapter 7 of the Environmental Statement accounts for the mitigation measures outlined in the outline environmental management plans for the respective phases of the Proposed Development. We do not consider the mitigated nature of effect to be inaccurate and note that the Applicant recognises impacts to the public water supply and Anglian Water and Severn Trent distribution mains to be of minor adverse effect when compared with effects to other hydrology and hydrogeology receptors.

Clinical Audit of Water Quality Mitigation and Enforcement Gaps

Mitigation measures
As stated by in AS-061, Chapter 7 of the Environmental Assessment heavily relies on the implementation of management plans including the outline CEMP and Water Resources Plan to secure mitigation against water quality impacts. The process ensures that these mitigation measures are secured via Requirements 13, 14 and 20 of the draft Development Consent Order (REP5-007).

Detail available in Environmental Management Plans
As stated in AS-061, there are details currently absent from these management plans for which the Environment Agency have requested further information. We do not consider these outstanding details to be at odds with the findings of the Environmental Statement and expect these to be incorporated into the detailed

versions of these plans, to be developed post-consent. Note that, as secured in Requirements 7, 13, 14 and 20 of the draft DCO, the Environment Agency will be statutory consultees on the final Battery Safety Management Plan, CEMP, OEMP and DEMP, which will provide opportunity to ensure that any outstanding clarifications or items of concern can be addressed prior to commencement of the respective phase.

AS-061 states in Section V.2 that the Environment Agency made a 'confirmed statutory objection'. It should be clarified that as statutory consultees in the Development Consent Order process, the Environment Agency would advise the Planning Inspectorate whether the Applicant has met required policy and may recommend objection if not. The Environment Agency comments raised in AS-061 are requests for further detail from the Applicant and should not be interpreted as formal objections to the Proposed Development.

Water quality monitoring
In our representations in REP2-094 and REP5-082 'Water Quality Monitoring' we commented on the need for water quality monitoring to be carried out during the construction, operation and decommissioning phases of the Proposed Development. The specific details of the Water Management Plan, which will incorporate details of pre, during and post-construction monitoring will be set out in this document, which will be submitted as part of the CEMP and OEMP, and therefore as the Environment Agency are statutory consultees we will be available to review and ensure the WMP is both detailed and site-specific, as stated in AS-061. This must include full details of the parameters to be monitored, sampling locations and frequencies, screening criteria and trigger and action levels informed by baseline monitoring data and surface water quality criteria for specific pollutants, priority substances and other pollutants.

WFD Compliance and Screening Gaps
As we have stated in our response to Examiner's Questions 2 (REP4-062), we view the WFD Screening Assessment to be complete, that no further consideration of WFD matters are required and that all activities can be screened out. As stated above, we are of the view that the mitigation measures secured via the outline CEMP, OEMP and DEMP and their supporting documentation will be sufficient to prevent deterioration of the identified WFD waterbodies from occurring.

Specialist Accreditation Assurance

As established in Section 8.3.11 of Chapter 8 of the Environmental Statement, the Applicant states that a Preliminary Risk Assessment has been undertaken in line with the technical approach presented in Land Contamination Risk Management (LCRM) (Environment Agency, 2021). This is also stated in Section 1.3 of the Phase 1 Desk Study report (Preliminary Risk Assessment) submitted as APP-099 to APP-104. As set out in LCRM guidance, the person responsible for applying LCRM must be appropriately competent in the tasks they are doing for each stage.

British Standard BS10175:2011+A2:2017 (British Standards Institution, 2017) states that although prescription of qualifications and experience required for persons carrying out the tasks involved in site investigation is outside the scope of the Standard (with the exception of lead drillers, support operative drillers and excavation plant operators), the personnel performing the roles should be appropriately knowledgeable, qualified, trained and experienced.

All technical assessments and survey activities should be completed and subject to review by appropriately accredited and experienced individuals in the applicable field. Note that as stated in Table 1.2 of Chapter 1 of the Environmental Statement (APP-030) Regulation 14(4) of the EIA Regulations requires that:

a. The applicant must ensure that the environmental statement is prepared by competent experts; and
b. The environmental statement must be accompanied by a statement from the applicant outlining the relevant expertise or qualifications of such experts.

Table 1.4 establishes the qualifications and competencies of the EIA team, inclusive of specialists in the Hydrology and Land and Soils disciplines.

References

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British Standards Institution, 2017. Investigation of potentially contaminated sites – Code of Practice BS 10175:2011+A2:2017

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Environment Agency, 2025a. Risk of Flooding from Surface Water with climate change speed dataset. Available online at: Risk of Flooding from Surface Water - Speed - Climate Change 1

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Environment Agency, 2025c. Protect Groundwater and prevent groundwater pollution

Environment Agency, 2025d Preparing a hydrogeological impact assessment
Tuflow, 2025. Layered flow constrictions and storage reduction factors as described within the Tuflow manual available online at: TUFLOW Classic/HPC User Manual 2025.2

Wang, F., and Gao, J., 2023. *How a photovoltaic panel impacts rainfall-runoff and soil erosion processed on slopes at the plot scale*. Journal of Hydrology.

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ExQ3	Question to:	Question:
Q12.0.2	EA	**Policy compliance** Paragraph 5.8.12 of NPS EN-1 states: “Development should be designed to ensure there is no increase in flood risk elsewhere, accounting for the predicted impacts of climate change throughout the lifetime of the development. There should be no net loss of floodplain storage and deflection or constriction of flood flow routes should be safely managed within the site. Mitigation measures should make as much use as possible of natural flood management techniques.” 1) Does an increase in flood levels of any amount, caused by the proposed development, result in a higher flood risk, in policy terms as outlined above? Please provide evidence and policy context for the position. 2) Does the proposed development result in a net loss of floodplain storage? 3) Has the scheme been designed to ensure that any deflection or constriction of flood flow rates are safely managed?

Environment Agency Response:

1)
The applicant has provided different forms of assessment of the impact their development will have on flood risk. Specifically, they have undertaken calculation of the volume loss of floodplain due to the solar panel supports and invertor station stilts and assessed the impact this will have on flood levels. This is showed to have a 2.2mm increase on the west floodplain of the River Trent and 3.5mm increase on the east floodplain of the River Trent. The applicant has also undertaken hydraulic modelling using a storage reduction and flow constriction approach, to assess the loss of storage and flood flow conveyance impacts due to the development. This has shown to have minimal impacts on water levels with a small area of land having a maximum increase of 3mm. The Environment Agency have no prescribed methods for assessing the impact of solar panel support columns on flood risk. Volumetric and hydraulic modelling approaches can be used but both methods carry a degree of uncertainty. Considering these uncertainties, applying two different methods enables some wider understanding with respect to any variance in impact. The volumetric and modelling assessments show negligible impacts in a similar range. In terms of the hydraulic modelling, the variation in levels is arguably beyond the precision limitations of the mathematical solver used within the hydraulic modelling software.

We feel the applicant has implemented mitigation throughout the design of the site by raising of infrastructure above the design flood level and spacing the supports as wide as possible to reduce the risk of debris build up (full details in Q 12.0.5) which is proportionate to the level of risk the development is at and causes. We await a full assessment of the modelling outputs in the updated FRA which is to be submitted at deadline 6 and the EA will provide full comment on this once reviewed before Deadline 7.

Cont/d..

In conclusion, the evidence which has been presented to us at the present time shows the development to have negligible impact on flood risk elsewhere and that appropriate mitigation has been incorporated into the design of the site through a sequential approach in site layout and raising of all infrastructure above the design flood level.

2)
When looking at the figures produced by the applicant within table 3.9 page 36 of the updated FRA (document reference: REP5-028) it is presented that there will be a loss of floodplain storage due to the built infrastructure (panel supports and stilts below invertor stations). Providing level for level floodplain compensation would be technically challenging given the dispersed nature of the panel and inverter station supports across the floodplain. Given the marginal effect of the solar panel supports on water level as demonstrated by the applicant's volumetric assessment and more recently flow constriction hydraulic modelling, it would be difficult to demonstrate that compensatory storage equating to the proposed loss of floodplain, such as scrapes or volumetric offsets, would deliver an observable hydraulic benefit.

3)
The applicant has incorporated wide spacing between solar panel legs and stilts of invertor stations to ensure the free flow of flood water, reduce the risk of debris build-up and the impact development may have on flow routes. The applicant has then tested this spacing with the hydraulic model by implementing a flow constriction layer which mimics the changes the solar panels would cause on flow. This has shown that the development does not increase flood extents meaning flow routes would not be adversely impacted and are safety managed on site.

In some cases, panel frames can pose a blockage risk, particularly for larger debris such as trees, however, in the case of One Earth Solar farm the solar panel areas only start to become inundated in the 1% (1 in 100) annual exceedance probability plus climate change scenarios and the respective peak velocities in the panel areas are low generally being around 0.1 metres per second or less. On this basis we do not believe the panel frames present a significant blockage risk or flow deflection risk.

ExQ3	Question to:	Question:
Q12.0.3	EA	**Policy compliance** Paragraphs 5.8.30 and 5.8.31 of, NPS EN-1 states: "Where a development may result in an increase in flood risk elsewhere through the loss of flood storage, on-site level-for-level compensatory storage, accounting for the predicted impacts of climate change over the lifetime of the development, should be provided. Where it is not possible to provide compensatory storage on site, it may be acceptable to provide it off-site if it is hydraulically and hydrologically linked. Where development may cause the deflection or constriction of flood flow routes, these will need to be safely managed within the site."

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		1) Does the proposed development result in an increase in flood risk elsewhere through the loss of flood storage 2) Can the EA please provide their position on whether both aspects of this policy test have been met, including evidence to support the position.

Environment Agency Response:

As highlighted in our response to Q12.0.2, we have assessed the impacts of the proposed development to be negligible on flood risk. Elevating the solar panels and inverter stations on columns is considered a form of mitigation as it maintains floodplain connectivity and flow paths. Technically there is a volumetric loss associated within these columns although providing level for level floodplain compensation would be technically challenging given their dispersed distribution across the floodplain. Given the marginal effect of the solar panel supports on water level as demonstrated by the applicant's volumetric assessment and more recently flow constriction hydraulic modelling, it would be difficult to demonstrate that compensatory storage equating to the proposed loss of floodplain, such as scrapes or volumetric offsets, would deliver an observable hydraulic benefit.

ExQ3	Question to:	Question:
Q12.0.4	EA	**Policy compliance** Paragraph 5.8.41 of NPS EN-1 states: "Energy projects should not normally be consented within Flood Zone 3b, or Zone C2 in Wales, or on land expected to fall within these zones within its predicted lifetime. This may also apply where land is subject to other sources of flooding (for example surface water). **However, where essential energy infrastructure has to be located in such areas, for operational reasons, they should only be consented if the development will not result in a net loss of floodplain storage, and will not impede water flows."** (Our Highlighting) 1) Can the EA confirm that the proposed development would not result in a net loss of floodplain storage? 2) Can the EA confirm that the proposed development would not impede water flows? 3) In light of the above two questions can the Applicant and the EA please provide their position on whether both aspects of this policy test have been met, including evidence to support the position.

Environment Agency Response:

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It is our understanding that no part of the built development is within functional floodplain (Flood Zone 3b) and that there is no loss of storage within the functional floodplain. The only aspect of the development that is in functional floodplain is the cable crossing although this is below ground. The map in figure 1 below shows the extent of the present day 3.3% (1 in 30 year) annual exceedance probability event (AEP) and 1% (1 in 100 year) AEP floods from hydraulic modelling of the Tidal Trent (Jacobs, 2023) with respect to the red line boundary and proposed aspects of the development which we have digitised from the works key plan drawing (doc reference number EN-1-159/APP/2.3.2 Rev 03 dated 10th November 2025 examination library reference REP5-005). The 3.3% (1 in 30 year) extent represents the functional floodplain as defined within Table 1 of the Planning Practise guidance (Flood risk and coastal change - GOV.UK) . Additionally, we have included the 1% (1 in 100 year) AEP present day extent as this is a reasonable proxy for what the present-day functional floodplain (3.3% (1 in 30 year) extent might look like based on a higher central climate change allowance of +39% for the 2080s epoch (please see the additional notes section below for calculated peak flows for different AEP scenarios).

Figure 1: Extent of the 3.3% (1 in 30) and 1% (1 in 100) AEP scenarios with respect to the red line boundary and proposed development.

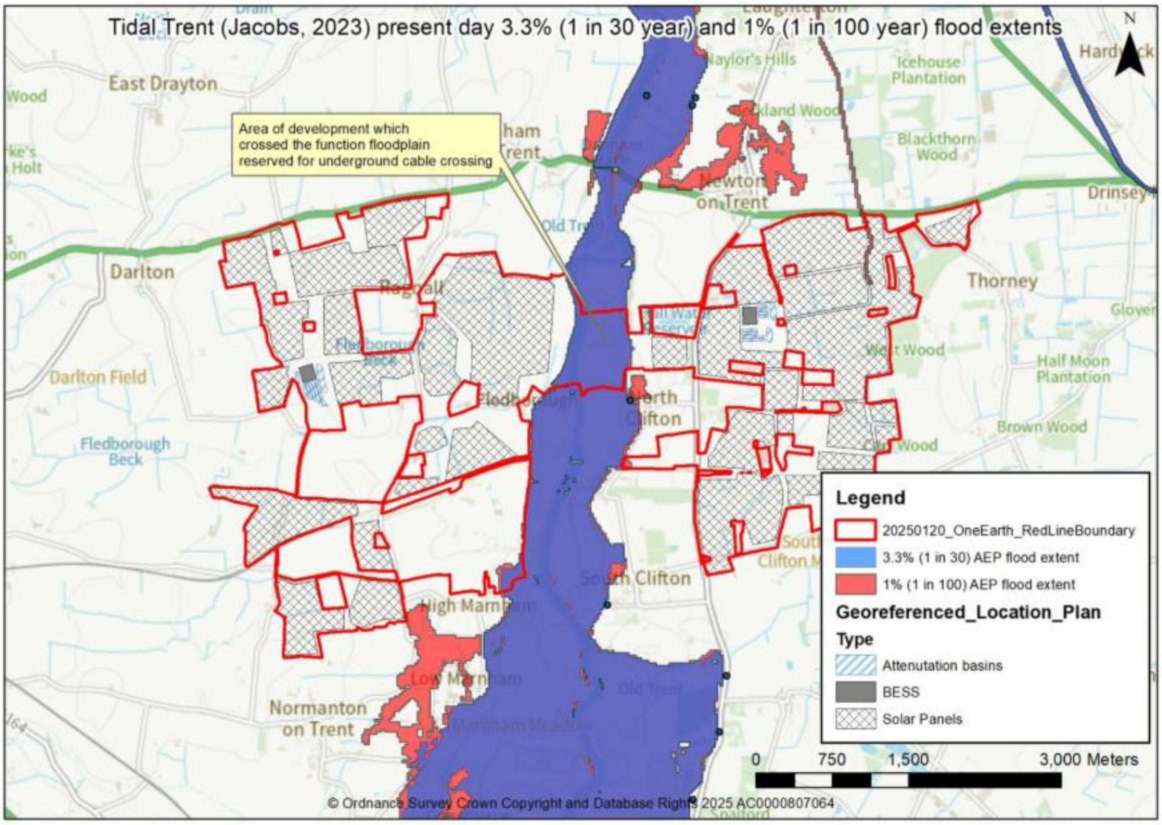

Figure 1 shows there will be no built footprint within the 1 in 30yrs flood event (FZ3b) and the 1 in 100yrs flood event (proxy for FZ3b +CC). This shows that there will be no loss of floodplain storage or impediment of flow routes in the functional floodplain. The policy cannot be split into two separate aspects as the highlighted section will only need to be assessed if there is development within the FZ3b or FZ3b + an allowance for climate change which there isn't. In conclusion, the applicant has not placed any development within FZ3b so we feel this part of policy has been satisfied.

Flows applied to the Tidal Trent (2023) hydraulic model

Peak flow at North Muskham for the 3.3% (1 in 30 year) AEP event = 869 m^3/s

Peak flow at North Muskham for the 1% (1 in 100 year) AEP event = 1215 m^3/s Peak flow at North Muskham for the 3.3% (1 in 30 year) AEP event plus 39% climate change scenario = 1208 m^3/s. NOTE – this flow is not applied to the 2023 hydraulic model as a scenario but reflects the 3.3% (1 in 30 year) flow scaled by 1.39. The resultant flow (1208m^3/s) is slightly lower than the 1% (1 in 100 year) AEP flow which has been considered in the 2023 modelling

ExQ3	Question to:	Question:
Q12.0.5	EA	**Policy compliance** In the event that one or both aspects of the policy tests set out in question Q12.0.3 above, paragraph 5.8.42 of NPS EN-1 states "Exceptionally, where an increase in flood risk elsewhere cannot be avoided or wholly mitigated, the Secretary of State may grant consent if they are satisfied that the increase in present and future flood risk can be mitigated to an acceptable and safe level and taking account of the benefits of, including the need for, nationally significant energy infrastructure as set out in Part 3 above. In any such case the Secretary of State should make clear how, in reaching their decision, they have weighed up the increased flood risk against the benefits of the project, taking account of the nature and degree of the risk, the future impacts on climate change, and advice provided by the EA or NRW and other relevant bodies." Can the EA please set out their position on this policy requirement, including evidence to support the position taken.
Environment Agency Response:		
As highlighted in Q.12.0.2 the development has been assessed to have negligible impact on flood risk. Specifically, any areas which are seen to have changes in water level are marginal and localised. The applicant's modelling shows potential changes of up to 3mm in places, but these are in areas which already flood to reasonable depths (generally greater than 0.3 metres). We await a full assessment of this in the updated FRA which is to be submitted at deadline 6 however we anticipate the assessment of this modelling to show no unacceptable or unsafe increases in flood risk. In conclusion we feel the applicant has provided sufficient evidence through volumetric calculation and additional hydraulic modelling to show that the site design has implemented sufficient mitigation to remain safe for its lifetime and not increase flood risk elsewhere.		

ExQ3	Question to:	Question:
Q12.0.6	EA	**Mitigation hierarchy** At ISH3 the EA stated that they were satisfied with the Applicant's approach to the mitigation hierarchy. 1) Can the EA please provide a full explanation and reasoning for this position, including reference to national policy. 2) Can the EA please explain how they consider the first stage of the mitigation hierarchy, avoid, has been addressed successfully?

Environment Agency Response:

We feel the applicant has followed the mitigation hierarchy on site by implementing design parameters which avoid flood risk where possible and appropriately mitigate where avoidance is not possible. Specifically, the applicant has taken a sequential approach when designing the site layout and placed the most vulnerable aspects of the development (BESS) outside of the floodplain. Additionally, they have implemented vertical avoidance design by raising the finished floor levels of all invertor stations above the design level as well as all solar panels.
The applicant has then implemented mitigation for all areas where development cannot avoid flood risk. The applicant has incorporated the following mitigation in to site design:

- Spacing of the legs of solar panels and stilts under invertor stations as wide as possible to allow the free flow of water below and minimise the build-up of debris.
- Voided structures under the invertor stations to minimise the loss of floodplain storage.
- Maintenance schemes for the clearing of any debris and sediment build up as well as inspections of all structures to reduce the risk of collapse of damaged infrastructure leading to blockages.
- Design of legs of panels to incorporate additional resilience against possible impacts of water and debris

We feel this follows policy and guidance set out in Paragraph 004 within the Planning Practice Guidance.

ExQ3	Question to:	Question:
Q12.0.7	EA	**SoCG** Can the Applicant and the EA please update the SoCG to account for D5 submissions.

Environment Agency Response:

We have worked with the applicant to update the SoCG to reflect the current position on all flood risk aspect which takes all submissions at D5 into consideration. The applicant is looking to submit this at D6. We are also expecting the updated version of the SoCG to include various other aspect in which we are in agreement with the applicant.

ExQ3	Question to:	Question:
Q12.0.8	EA	**Cumulative Impacts** Are the EA satisfied that the cumulative impacts of the proposed development on the Trent Valley catchment have been assessed adequately?

Environment Agency Response:
We are satisfied that the measures which have been committed to by the Applicant in Chapter 8 of the Environmental Assessment (REP5-022/023) and various supporting documents including the Outline Battery Safety Management Plan (OBSMP, REP5-044/045), Outline Operational Environmental Management Plan (OOEMP, REP5-034/035), Flood Risk Assessment and Drainage Strategy (REP5-028/029) will provide sufficient mitigation to avoid significant detrimental impacts to groundwater or surface water receptors. On this basis we do not consider that there would be detrimental cumulative impacts to water quality and fluvial flood risk in the Trent Valley catchment from the Proposed Development.

End