



Tween Bridge Solar Farm

A Nationally Significant Infrastructure Project in the Energy Sector

Preliminary Environmental Information Report

Chapter 10 – Water Resource

March 2025



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10. Water Resources

10.1. Introduction

- 10.1.1. This chapter of the PEIR identifies the potential impacts on the water environment from the construction, operation and decommissioning of the Scheme. The water environment includes surface waterbodies (e.g. rivers, streams, ditches, canals, lakes and ponds, etc.), groundwater bodies, as well as flood risk and drainage.
- 10.1.2. The expected location of the National Grid substation required to connect the solar farm to the national electricity transmission network and the associated cable route have been included within the Draft Order Limits. These locations are subject to change and the method of cable installation will be fully assessed as part of the Environmental Statement. National Grid will be consenting the new substation separately.
- 10.1.3. A working draft of the PEIR was issued as part of the “non-statutory consultation”. This PEIR has been produced to support “statutory consultation” which begins on the 20th March 2025 and incorporates comments received on the working draft of the PEIR during “non-statutory consultation”.
- 10.1.4. This assessment reports on the baseline and Scheme design information available at the time of writing this PEIR.
- 10.1.5. Early responses from consultees and the scoping opinion dated 13th March 2023 have been taken into account during the preparation of this chapter. This is discussed in detail below.
- 10.1.6. Statutory consultees were also contacted in December 2024 for comment on the proposals detailed in this report. Their response has been included in this PEIR chapter.
- 10.1.7. The potential impacts on the water environment resulting from the Scheme focus on four main events:
- Erosion/sediment movement.
 - Chemical/pollution events.
 - Alteration/interruption of surface water flows.
 - Alteration/interruption of ground water flows.
- 10.1.8. With regards to the underground export cable to the National Grid Substation, the layout plan identifies an illustrative corridor for the underground export cable route which is based on the Applicant’s current assumptions as to the possible location of the National Grid substation within the National Grid Substation and RWE Underground Export Cable Route Assessment Area. A summary paragraph has been included within the Assessment of Likely Significant Effects section within this chapter which assesses the illustrative underground export cable corridor located within the overall National Grid Substation and RWE Underground Export Cable Route Assessment Area.
- 10.1.9. A 2km Zone of Influence has been considered within this chapter.

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10.1.10. This chapter is supported by the following figures and appendix.

- **Appendix 10.1 Flood Risk Assessment**
- **Figure 10.1 Flood Map for Planning**
- **Figure 10.2– BGS Bedrock Geology**
- **Figure 10.3 – Hydrogeology Aquifer Classification**
- **Figure 10.4 – EA Reservoir Flood Extents**
- **Figure 10.5 – EA Historic Flood Map**

10.1.11. Baseline and assessment work is ongoing. The following information will be made available to accompany the Environmental Statement.

- Assessment of detailed design.
- Provision of a detailed Surface Water Drainage Strategy.

10.2. Consultation

10.2.1. A summary of the “non-statutory consultation” responses received from the IDB and EA is provided in Table 10.1 below. Table 10.1 also details how these comments have been addressed during “non-statutory consultation” and within the working draft PEIR chapter and formal PEIR chapter prior to commencement of “statutory consultation” which begins on the 20th March 2025.

10.2.2. As part of the PEIR updates, Table 10.1 has also now been updated to include confirmation as to how non-statutory consultee comments have been considered and also to include any further consultees comments received in December 2024 when contacted during the preparation of this PEIR chapter.

10.2.3. Following issue of the working draft PEIR chapter, further non-statutory consultation comments from the Lead Local Flood Authority (North Lincolnshire Council and City of Doncaster Borough Council) and Yorkshire Water have been received. These comments are summarised in Table 10.2.

Table 10.1: Summary of IDB and EA Consultation

CONSULTEE	SUMMARY OF NON-STATUTORY CONSULTATION RESPONSES – DRAFT PEIR	HOW RESPONSE HAS BEEN ADDRESSED BY APPLICANT – DRAFT PEIR	FORMAL PEIR – UPDATED CONSULTEE COMMENTS / APPLICANT CONSIDERATION
<p>Internal Drainage Board (Doncaster East IDB)</p>	<p>Any cable crossings under IDB owned rhynes will need to be directionally drilled.</p> <p>All pumping stations are maintained on a set schedule.</p> <p>9m offset must be kept to IDB watercourse.</p> <p>Other watercourses would suggest using 5m easement to one side minimum.</p> <p>Try to use existing crossings where possible, any new crossings would preferably be a bridge rather than a culvert.</p> <p>We could put a culvert crossing in if we are removing one further along, and therefore creating a like for like replacement.</p>	<p>Restrictions noted and relayed to the layout designer in relation to 9m offsets already noted as an IDB requirement.</p> <p>Directional drilling noted to the client for consideration with cable routing.</p> <p>Access arrangements to be discussed with transport consultants to determine any new crossings needed for vehicles, both construction and maintenance.</p>	<p>The IDB were contacted for further comment on the site proposals in December 2024 but their response had not been received prior to completion of this chapter.</p> <p>9m IDB watercourse easements and 5m Ordinary Watercourse easements have been included in the proposed site layout.</p> <p>The assessment of the use of directional drilling on site is ongoing.</p> <p>The proposed crossing locations are shown on the proposed site layout plan. Where possible, existing crossings (both access points and internal) will be used.</p>

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<p>Environment Agency (Sustainable Places – Lincolnshire & Northamptonshire Area)</p>	<p>EA product 4 data has been sent through to Pegasus showing flood levels for the worst case event showing levels around 1-2m AOD.</p> <p>Critical Flood Level (CFL) of 4.1m AOD is being requested for the battery storage units and substations which does not align with the flood mapping.</p> <p>Solar panels were agreed to be less of a concern and do not need to be set at 4.1m AOD.</p> <p>Flood defences not preferable and all alternatives to be investigated prior to this suggestion.</p> <p>The EA have noted that assessment of impact on the development’s operation should be reviewed if a 4.1m AOD flood event was to occur.</p> <p>The EA would prefer not to have anything within the Flood Zone 3b area of the site however would accept solar panels in this location, subject to a Sequential Test and Exception Test being applied.</p> <p>Flood displacement would need to be compensated appropriately and connected hydraulically.</p> <p>Any crossings for cables under the main rivers need to be directionally drilled.</p>	<p>Further flood modelling has been noted by the EA and has been requested but not received to date.</p> <p>Agreement in place to review new data against site proposals to determine height of raising.</p> <p>Should levels of 4.1m not be achievable the EA have noted they would consider protection / resilience and are open to discussions on what this might be.</p> <p>Work is ongoing with regards to the Sequential Test and it is expected that this will be available for the next iteration of the PEIR.</p>	<p>Latest EA modelling from 2023 has been received and used to define flood risk mitigation measures of site.</p> <p>A full assessment of the application of the Sequential Test for the site will be included in full the Environmental Statement submitted with the DCO.</p> <p>The EA were contacted for further comments on the site proposals in December 2024. There responses were received in January & February 2025 and overall, the EA confirmed they are happy with the proposed flood risk mitigation measures on site. The have confirmed they are happy with:</p> <ul style="list-style-type: none"> - Proposed solar panel raising. - Essential infrastructure being located in Flood Zone 3b assuming no land raising is proposed. - Proposed 9m Main River easements (both sides of rivers).
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			<p>It is expected that further information is included within the full Environmental Statement to cover the following items raised by the EA:</p> <ul style="list-style-type: none"> - Containment of potentially contaminated fire water. - Consideration of where a Flood Risk Activity Permit may be required for the proposals.
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Table 10.2 Summary of LLFA and Yorkshire Water Consultation

CONSULTEE	SUMMARY OF NON-STATUTORY CONSULATION RESPONSES	HOW RESPONSE HAS BEEN ADDRESSED BY APPLICANT – FORMAL PEIR
<p>Lead Local Flood Authority (North Lincolnshire Council)</p>	<p>Would not expect formalised surface water drainage features for the solar panels noting the vast number of watercourses on site and the betterment the proposed land use will provide.</p> <p>Would expect to see how the potential was increased runoff / erosion between rows of solar panels would be mitigated.</p> <p>Suggested the Applicant considers provision of cut-off drainage features on site.</p>	<p>The impact of the Scheme on existing surface water drainage patterns on site has been assessed in detail in the appended Flood Risk Assessment. This included an assessment of water quality although it is noted that many of the details of water quality management will follow upon completion of a detailed surface water drainage strategy for the site.</p> <p>The North Lincolnshire LLFA were contacted for further comment on the site proposals in December 2024 but their response had not been received prior to completion of this chapter.</p> <p>The provision of safe refuge will be considered in the full Environmental Statement as part of the DCO.</p>

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	<p>Would expect the Applicant to consider the provision of safe refuge on site.</p>	
<p>Lead Local Flood Authority (Doncaster Borough Council)</p>	<p>May require a 10m easement free from development from the top of bank of watercourses on both sides unless sufficient information as to how watercourses will be maintained is provided.</p> <p>Confirmed the proposed solar panel raising is acceptable. Require a plan of predicted flood depths and solar panel raising.</p> <p>Noted that the volume of contained fire water may need to be discussed with emergency planning and not the LLFA.</p> <p>Land Drainage Consent will be required for any proposed cable watercourse crossings, and for fencing across watercourses.</p> <p>Provided "Solar Farm Drainage Strategy Advice".</p>	<p>An Operation and Maintenance Manual will be provided within the full Environmental Statement submitted with the DCO to alleviate concerns over a sufficient easement being left clear of development.</p> <p>Plans of the modelled flood depths and clearly labelled proposed panel raising is include in the Flood Risk Assessment appended to this PEIR.</p> <p>Once a detailed drainage strategy is prepared, advice will be sought from the projects fire consultant with regards to its suitability. The Solar Farm Drainage Strategy Advice will also be reviewed.</p> <p>Land Drainage Consent will be considered separately to the planning process.</p>
<p>Yorkshire Water</p>	<p>Confirmed that the site is absent of sewers.</p> <p>Highlighted several clean water assets crossing the site.</p> <p>Would expect to see the impact of the proposed development on water quality being considered, noting the source protection zone below the site.</p>	<p>A Utilities Report has been completed by others for consideration into the site design, with avoidance of Yorkshire Water assets where possible.</p> <p>The impact of the Scheme on water quality is included in the Flood Risk Assessment appended to this PEIR. Many of the details of water quality management will follow upon completion of a detailed surface water drainage strategy for the site.</p>

10.3. Assessment Approach

Methodology

10.3.1. The technical guidance of the NPPF requires assessment of all potential sources of flooding with respect to new development. This has been carried out in a separate Flood Risk Assessment ('the FRA') by Pegasus Group and is included as a Technical Appendix of this PEIR (Technical Appendix 10.4). The FRA appended to this PEIR assesses the risk of flooding from the following sources:

- Fluvial
- Tidal
- Surface Water Flooding
- Groundwater
- Flooding from Sewers
- Artificial Sources (Canals and Reservoirs).

Assessment of Significance

10.3.2. The approach followed during the assessment considered the degree (or the 'significance') of the potential effects upon the hydrological and hydrogeological characteristics of the Site. The significance has been defined taking into account the sensitivity of the receiving environment and the potential magnitude of the impact, consistent with the broad methodology set out in Chapter 3 of this report. For this Chapter, the definition of the receiving environment is set out in Table 10.3 below taken from the Design Manual for Roads and Bridges guidance LA103 documents:

Table 10.3: Definition of the Receiving Environment

Sensitivity	Definition
High	Receptor with a high quality and rarity, regional or national scale and limited potential for substitution/replacement Inner Source Protection zone (Zone 1) Site of Special Scientific Interest ('SSSI') or Special Area of Conservation ('SAC') Excellent water quality Large scale industrial agricultural abstractions >1000m ³ /day within 2km downstream, or abstractions for public drinking water supply Designated salmonid fishery and/or salmonid spawning grounds present Watercourse widely used for recreation, directly related to watercourse quality (e.g. swimming, salmon fishery etc.) within 2km downstream

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	<p>Conveyance of flow and material, main river >10m wide</p> <p>Active floodplain area (important in relation to flood defence)</p>
Medium	<p>Receptor with a medium quality and rarity, local scale and limited potential for substitution/replacement or receptor with a medium quality and rarity, regional or national scale and limited potential for substitution/replacement</p> <p>Outer Source Protection Zone (Zone 2)</p> <p>Nitrate Vulnerable Zone</p> <p>Principal Aquifer</p> <p>Good water quality</p> <p>Large scale industrial agricultural abstractions 500-1000m³/day within 2km downstream</p> <p>Surface water abstractions for private water supply for more than 15 people</p> <p>Designated salmonid fishery and/or cyprinid fishery</p> <p>Watercourse used for recreation, directly related to watercourse quality (e.g. swimming, salmon fishery etc.)</p> <p>Conveyance of flow and material, main river >10m wide</p> <p>Active floodplain area (important in relation to flood defence)</p>
Low	<p>Receptor with a low quality and rarity, local scale and limited potential for substitution/replacement or receptor with a low quality and rarity, regional or national scale and limited potential for substitution/replacement</p> <p>Total Catchment Source Protection Zone (Zone 3)</p> <p>Secondary Aquifer</p> <p>Fair water quality</p> <p>Industrial/agricultural abstractions 50-499m³/day within 2km downstream</p> <p>Designated cyprinid fishery or undesignated for fisheries – Occasional or local recreation (e.g. local angling clubs)</p> <p>Groundwater abstractions 50-500m³/day – Private water supplies present</p> <p>Designated cyprinid fishery, salmonid species may be present and catchment locally important for fisheries</p>

	Watercourse not widely used for recreation, or recreation use not directly related to watercourse quality
Negligible	<p>Receptor with a negligible quality and rarity, local scale and limited potential for substitution/replacement</p> <p>No SPZ</p> <p>Unproductive Strata</p> <p>Environmental equilibrium stable and resilient to changes that are greater than natural fluctuations, without detriment to its present character</p> <p>Polluted/poor water quality</p> <p>Industrial/agricultural abstractions < 50m³/day within 2km downstream</p> <p>Fish sporadically present or restricted, no designated fisheries; not used for recreation</p> <p>Watercourse < 5m wide</p> <p>Area does not flood/is located in EA Flood Zone 1</p> <p>Receptor heavily engineered or artificially modified and may dry up during summer months</p>

10.3.3. The magnitude of the impact/change includes the timing, scale, size and duration of the potential impact. For the purposes of this assessment, the magnitude criteria are defined in Table 10.4 below taken from the Design Manual for Roads and Bridges guidance LA103 document.

Table 10.4: Magnitude of Change

Magnitude	Criteria	Description and example
High	Results in loss of attribute	<p>Fundamental (long term or permanent) changes to the hydrology/hydrogeology:</p> <ul style="list-style-type: none"> • Loss of EC designated Salmonid fishery • Loss of designated species/habitats • Change in water quality status of river reach • Compromise employment source • Pollution of potable source of abstraction • Loss of flood storage/increased flood risk

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Medium	Results in impact on integrity of attribute or loss of part of attribute	<ul style="list-style-type: none"> • Material but non-fundamental and short to medium term changes to the hydrogeology or water quality: • Loss in productivity of a fishery • Contribution of a significant proportion of the effluent in the receiving water, but insufficient to change its water quality status • Reduction in the economic value of the feature • Reduced reliability and quality of a supply at a groundwater abstraction source
Low	Result in minor impact on attribute	<ul style="list-style-type: none"> • Detectable but non-material and transitory changes to the hydrogeology or water quality: • Measurable change in attribute, but of limited size and/or proportion • Measurable but limited change in a groundwater supply reliability and quality
Negligible	Results in an impact on attribute but of insufficient magnitude to affect the use/integrity	<ul style="list-style-type: none"> • No perceptible changes to hydrogeology or water quality: • No significant effect on the economic value of the receptor • No change in a groundwater supply reliability and quality • No increase in flood risk

10.3.4. Consistent with the methodology set out in Chapter 3 of this report, the sensitivity of the receiving environment together with the magnitude of the change/impact defines the significance of the effect prior to the application of mitigation measures. So, for the purposes of assessing effects on the water environment, Table 10.5 sets out the relevant significance criteria.

Table 10.5: Significance Criteria

Magnitude of Change	Sensitivity of Receptor				
		High	Medium	Low	Negligible
High		Major	Major	Moderate	Negligible
Medium		Major	Moderate	Minor to Moderate	Negligible

	Low	Moderate	Minor to Moderate	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

10.3.5. Therefore, potential effects are concluded to be of major, moderate, minor or negligible. The shaded boxes in Table 10.5 represent effects considered to be significant.

Legislative and Policy Framework

10.3.6. This assessment is based on the following legislation, policy and guidance:

Water Framework Directive:

10.3.7. The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 ('WFD Regulations 2017') consolidate, revoke and replace the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003, which transpose the European Union (EU) Water Framework Directive (WFD) into national law. The WFD is a wide-ranging piece of European legislation that establishes a new legal framework for the protection, improvement and sustainable use of surface waters, coastal waters and groundwater across Europe in order to:

- Promote sustainable water use.
- Contribute to the mitigation of floods and droughts.
- Prevent deterioration and enhance status of aquatic ecosystems, including groundwater; and
- Reduce pollution.

10.3.8. Water management has historically been co-ordinated according to administrative or political boundaries. The WFD promotes a new approach based upon management by river basin – the natural geographical and hydrological unit. River basin management plans, published by the Environment Agency (EA) and the Department for Environment Food & Rural Affairs (Defra), include clear objectives in respect of water quality and pollution control and a detailed account of how objectives are to be met within a prescribed timeframe.

Flood and Water Management Act 2010

10.3.9. The Flood and Water Management Act (FWMA) 2010 takes forward some of the proposals set out in three previous strategy documents published by the UK Government: Future Water, Making Space for Water and the UK Government's response to the Sir Michael Pitt Review of the summer 2007 floods. In doing so, it gives the EA a strategic overview of flood risk and gives local authorities responsibility for preparing and putting in place strategies for managing flood risk from groundwater, surface water and ordinary watercourses in their areas.

10.3.10. The FWMA 2010 (Schedule 3) proposed the establishment of Sustainable drainage systems (SuDS) Approval Bodies (the SAB) at county or unitary local authority levels. The role of the SAB was envisaged as implementing the recommendations of the Pitt Review (2008) in promoting the use of SuDS within future development.

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10.3.11. Following a period of consultation, the proposed role of the SAB has been amended, with the promotion of SuDS being incorporated into the planning process. This has been achieved by designating LLFA's as statutory consultees with regards to 'local' sources of flood risk and surface water management. The Ministerial Written Statement HCWS161 details this change in policy, which came into effect in April 2015.

The National Planning Policy Framework (2024):

10.3.12. Chapter 14 of the National Planning Policy Framework "Meeting the challenge of climate change, flooding and coastal change" highlights the requirements on planning applications in relation to taking a proactive approach to mitigating and adapting to climate change, moving development away from flood risk areas where possible and considering marine and coastal management where applicable.

The Planning Policy Guidance (PPG) (2021):

10.3.13. The PPG for "Flood risk and coastal change" advises how to take account of and address the risks associated with flooding and coastal change in the planning process.

The National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2024):

10.3.14. The NPS EN-3 considers matters specific to renewable energy infrastructure, including solar PV. With regards to flooding, NPS EN-3 details that where solar sites are proposed in low lying exposed sites, that applicants must show how the site will be resilient to increased risk of flooding and the impacts of climate change.

10.3.15. NPS EN-3 also states that "where a Flood Risk Assessment has been carried out this must be submitted alongside the applicant's ES. This will need to consider the impact of drainage. As solar PV panels will drain to the existing ground, the impact will not, in general, be significant."

The National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023):

10.3.16. This National Policy Statement (NPS), taken together with the Overarching NPS for Energy (EN-1), provides the primary policy for decisions taken by the Secretary of State on applications it receives for electricity networks infrastructure.

10.3.17. With reference to flood risk and drainage, NPS EN-5 details that applicants are required to set out how developments have been designed to be resilient to flooding, particularly for substations the are vital to the network.

North and North East Lincolnshire Strategic Flood Risk Assessment (SFRA) (2022):

10.3.18. This Strategic Flood Risk Assessment (SFRA) is an update of the original report, which was published in 2011. The main purpose of an SFRA is to provide the information needed for a planning authority to take flood risk into account when making land use allocations and determining planning applications.

10.3.19. The purpose of this update is to ensure the SFRA provides a comprehensive and robust evidence base to inform the preparation and production of the North Lincolnshire Local Plan to 2038 and the future review of the North East Lincolnshire Local Plan.

- 10.3.20. This revised SFRA will be used by both North and North East Lincolnshire Councils in decision making and to inform decisions on the location of future development and the preparation of sustainable policies for the long-term management of flood risk taking into account the latest and most up to date information.

North Lincolnshire Council Development and Flood Risk Guidance Note (April 2013):

- 10.3.21. This guidance note provides local advice to developers, applicants and council officers on the application of national planning policy contained within the National Planning Policy Framework (NPPF) which aims to avoid inappropriate development in areas of flooding by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.

North Lincolnshire Local Flood Risk Management Strategy (August 2016):

- 10.3.22. Much of North Lincolnshire is flat and low lying and is therefore susceptible to flooding from a range of sources. Therefore, whilst this document focuses on local flood risks, it also sets out how all of the Risk Management Authorities covering North Lincolnshire have agreed to work together to consider risks from all potential sources of flooding. The Environment Agency is currently developing a Flood Risk Management Plan for the Humber catchment, within which North Lincolnshire is located, which will consider flooding from non-local sources, such as rivers and the sea.

The CIRIA SUDS Manual (CIRIA 753):

- 10.3.23. The SuDS Manual (2015) expands upon the framework set out by the Government's Non-Statutory Technical Standards for SuDS and sets out the latest industry practice and guidance regarding the planning, design, construction, management and maintenance of SuDS.

Scoping Criteria

- 10.3.24. The Planning Inspectorate Scoping Opinion dated 13 March 2023, provided a range of hydrology and flood risk related comments. These comments are summarised in Table 10.6, alongside the Applicant's Response from the previous draft PEIR and from this formal PEIR.

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Table 10.6: Extract of aspect based scoping table from Scoping Opinion

ID	REF	MATTER	PLANNING INSPECTORATE COMMENTS	APPLICANT'S RESPONSE – DRAFT PEIR	APPLICANT'S RESPONSE – FORMAL PEIR
3.9.2	Paras 8.3 and 8.25; Figure 8.1	Flood Risk	<p>The ES and Flood Risk Assessment including accompanying figures should distinguish between areas of Flood Zones 3a and 3b.</p> <p>The scoping consultation response from the Environment Agency (Appendix 2 of this Opinion) states that indicative locations for components including the proposed National Grid substation and BESS are within Flood Zone 3b. Any mitigation measures to reduce significant effects from flooding should be described</p>	<p>These comments will be addressed by the Flood Risk Assessment and Drainage Strategy reports.</p>	<p>The Flood Risk Assessment appended to this formal PEIR chapter includes plans that clearly distinguish between areas of Flood Zone Flood Zone 3b on site to address the comments.</p> <p>The impact of the Scheme on existing floodplain storage volume is assessed in detail in the Flood Risk Assessment as an appendix to this PEIR chapter.</p> <p>Full details of the proposed flood risk mitigation measures on site are detailed in the Flood Risk Assessment appended to this PEIR.</p> <p>Non-statutory consultation comments from the EA confirm they are generally happy with the flood risk mitigation measures proposed, including those in relation to Flood Zone 3b.</p>

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			in the ES and their delivery secured through the DCO or other legal mechanism.		
3.9.3	Para 8.7	Underlying Geology	<p>Paragraph 8.7 of the Scoping Report states that <i>"It is unlikely that Made Ground exists beneath the site boundary"</i>. This is not consistent with the information provided within Section 7 of the Scoping Report, which identifies manmade working and placement of alluvium.</p> <p>The ES should present consistent baseline information across relevant aspect chapters. Impacts resulting from disturbance of any made ground which are likely to result in significant effects on hydrological/hydrogeological</p>	Addressed within the draft PEIR chapter.	Potentially significant impacts on hydrological/hydrogeological receptors have been assessed in detail within this formal PEIR chapter (see section 10.5).

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			receptors should be assessed in the ES.		
3.9.4	Para 8.18	Surface Water Management Strategy	A draft/ outline copy of the Surface Water Management Strategy (proposed for the operational phase) should be appended to the ES.	To be provided in the final version of the PEIR.	An outline Surface Water Drainage Strategy has been prepared and is included in the Flood Risk Assessment appended to this formal PEIR. Details of this strategy will be confirmed as part of the detail design information to be approved under the DCO.
3.9.5	Para 8.27	Sensitive Receptors	<p>The table at paragraph 8.27 of the Scoping Report ('Summary of Potential Environmental Receptors') lists only a single receptor type (groundwater) with no reference to flood risk, surface water or other specific receptors.</p> <p>The ES should present a complete list of hydrological, hydrogeological and flood risk receptors which are likely to be impacted by the Proposed</p>	Addressed within the draft PEIR chapter.	<p>This formal PEIR assesses a full range of hydrological, hydrogeological and flood risk receptors and assessed the likely significant effects.</p> <p>The site is located above a Total Catchment Source Protection Zone. In accordance with the Design Manual for Roads and Bridges guidance LA103 documents, these zones are classified as having Low sensitivity (see Table 10.3). The Ground Condition Chapter (Chapter 9), details the presence of a Secondary Superficial Aquifer below the site (see section 9.4) which is defined as having Medium vulnerability. This PEIR chapter considers this classification.</p>

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			<p>Development and assess any likely significant effects on those receptors.</p> <p>Paragraph 7.15 of the Scoping Report describes overall groundwater vulnerability to pollution as “Low or Medium”, while the table at paragraph 8.27 describes the Source Protection Zone (SPZ) below Thorne as “low” sensitivity. In some places, groundwater should be considered highly vulnerable due to the presence of SPZ3. The approach to determining the sensitivity/ vulnerability of identified receptors should be explained in the ES and clearly and consistently cross referenced across the Ground Conditions and Hydrology and</p>		
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			Flood Risk ES assessments.		
3.9.6	n/a	Water Framework Directive (WFD)	The Scoping Report identifies the potential for contamination of surface water and groundwater bodies. Given the geographic location of the Proposed Development, the ES should consider the potential impacts on WFD water bodies. The Applicant's attention is drawn to the Inspectorate's Advice Note Eighteen: The WFD in this regard. The ES should explain the relationship between the Proposed Development and any relevant water bodies in relation to the current relevant River Basin Management Plan.	Addressed within the draft PEIR chapter.	Addressed within this PEIR chapter – refer to Section 10.5 which assesses the likely significant effects of the Scheme on surface water and groundwater bodies.

Limitations to the Assessment

- 10.3.28. This Chapter is limited to the effects from rainfall falling on the Site as well as increase in sea levels and its management in flow and quality in relation to the receiving watercourses. It does not consider the ecology of the habitats, which is covered in Chapter 8 of this PEIR.
- 10.3.29. By its nature, rainfall, antecedent conditions and characteristics vary, as well as conditions related to normal rainfall standards; exceedance events could potentially cause nuisance, which are beyond the scope of this assessment.
- 10.3.30. The FRA (Technical Appendix 10.1) and PEIR chapter are reliant on publicly available data and additional data provided by consultees; it is assumed that this information is correct and complete.

10.4. Baseline Conditions

Site Description and Context

- 10.4.1. The Site broadly lies between the settlements of Thorne and Crowle, occupying separate parcels of land within a relatively flat agricultural landscape predominantly in arable use for the cultivation of cereal crops with some areas of modified grassland and short rotation coppice. Many of the field boundaries are subdivided into rectilinear parcels by long linear drainage ditches, some with partial or sporadic hedgerows. The Scheme's development parcels are dissected by several major roads and routes, including the M180 motorway, the A18, the South Humberside Main Line railway route and Stainforth & Keadby Canal.
- 10.4.2. Numerous other minor roads cross the landscape connecting scattered residential properties and farmsteads, many of which lie adjacent or in proximity to the site. There are existing wind turbines within the northern end of the Site. Overhead power lines and lattice pylons runs across the northern part of the Scheme which creates other vertical elements within the landscape. There are wooden pole lines and masts within the Draft Order Limits.
- 10.4.3. Bar the two areas of significant woodland to the north and south of the Site associated with former peat extraction at Hatfield Moors and Thorn Moors, the landscape contains relatively limited areas of vegetation, largely limited to field boundaries in the form of hedgerows, which many are incomplete and gappy. There are occasional scattered trees or groups of trees and some small woodland copses.
- 10.4.4. There are four number Public Rights of Way (PRoW) that are located within or close to the Scheme. (See Figure 6.4 Recreation Plan). Public Footpath FP19 (Thorne) lies in the central northern part of the site forming part of the access to Tween Bridge Solar Scheme. Public Footpath FP15 (Thorne) lies just beyond the most northwestern boundary of the Scheme. In the northeastern part of the Scheme Public Right of Way (Footpath 17) lies beyond the Scheme area forming a continuation of an unnamed north-east/southwest Byway. Footpath 18 runs from the unnamed byway south eastwards into the western side of Crowe.
- 10.4.5. For the purposes of reporting, a parcel and parcel number have been created to divide areas of the DOL for the Scheme to assist with reporting and to aid the reader. The land plan is provided at illustration 1 and a scaled drawing is provided at Appendix 4.1.

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Baseline Survey Information

- 10.4.6. There are many field drain ditches running across the Site, assumed to be used for agricultural drainage. The closest Main Rivers noted by the EA are the two drains running adjacent to the canal crossing the midsection of the Site and the Hatfield Waste Drain at the southern end of the site. The IDB map provided shows a large number of rhynes across the Site that will be a key asset of the IDB requiring 9m easements from the top of bank on both sides, where appropriate.
- 10.4.7. The Site is currently agricultural greenfield area, typically there should not be pipework under the fields however it has been identified from the IDB mapping that there are culverted pipes owned and maintained by the IDB.
- 10.4.8. Geological data held by the British Geological Survey ('BGS') indicates that the bedrock geology underlying the Site is Sherwood Sandstone Group – Sandstone. Sedimentary bedrock & Mercia Mudstone Group – Mudstone. Sedimentary bedrock.
- 10.4.9. The Soilscape soils data shows the Site to be 'Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils' and 'Raised bog peat soils' and 'Loamy and clayey soils of coastal flats with naturally high groundwater'. Therefore, it can be considered that the Site does not benefit from a high rate of infiltration.

Fluvial (River) Flooding

- 10.4.10. The Flood Map for Planning generally defines the entire site as Flood Zone 3, at High risk of flooding, predicted to be impacted by a 1 in 100 year fluvial flood event. The Flood Map for Planning is shown in Figure 10.1.
- 10.4.11. The Risk of Flooding from Rivers and Seas dataset was released in January 2025 and is expected to be used to update the Flood Map for Planning in Spring 2025. A plan of the Risk of Flooding from Rivers and Seas dataset is included in the Flood Risk Assessment appended to this PEIR. The dataset predicts the vast majority of the site to be at risk of flooding. Large areas are predicted to have a High likelihood of flooding, predicted to be impacted by a 1 in 30 year flood event.
- 10.4.12. As detailed in the EA correspondence included in the FRA appendices, parts of the site are also defined as Flood Zone 3b, the functional floodplain predicted to be impacted by a 1 in 30 year fluvial flood event. A plan of Flood Zone 3a and Flood Zone 3b is included in the Flood Risk Assessment appended to this PEIR. Where development is proposed here, level-for-level floodplain compensation may be required.
- 10.4.13. There are a large number of watercourses on site and in the surrounding area, many of which are managed by the IDB.
- 10.4.14. Correspondence with the EA highlights that the site is at risk of flooding from the tidal River Trent, the River Torne and associated Drains. The EA also highlight that land drainage represents the dominant flood risk at the site and that the site is located in the Isle of Axholme Critical Drainage Area which has a reported critical flood level of 4.1mAOD.
- 10.4.15. Mitigation measures on site are proposed to include raising proposed solar panels and associated infrastructure above the 1 in 1000 year tidal Trent flood level plus an allowance for 100mm of freeboard (raising proposals are detailed further in the appended Flood Risk

Assessment). This tidal flood level is from the Tidal Trent model received from the EA. Although advised by the EA that the Site has a critical flood level of 4.1mAOD, given the ground levels on site generally vary between approximately -0.2mAOD and 2.6mAOD, it is not feasible to raise infrastructure above this critical flood level.

- 10.4.16. In addition, although no formal information has been provided as to how the critical flood level has been derived, it is understood based on discussions with the EA that this level accounts for an absolute worst-case scenario where no defences are acting to protect the Site. This includes failure of a range of IDB and EA controlled pumping stations which control water levels at the Site and a large surrounding area. Given the design life of the Scheme of approximately 40 years, this event and the critical flood level of 4.1mAOD is considered a highly unrealistic scenario.
- 10.4.17. In addition to providing details of the critical flood level at the site, the EA also provided detailed hydraulic model data for the River Torne. The outputs of the River Torne model predict significantly reduced flood risk at the Site compared to the Tidal Trent model discussed above and as such, proposed mitigation measures designed against the tidal outputs will suitably protect the development from the fluvial flood risk associated with the River Torne.
- 10.4.18. Overall, the fluvial flood risk to the site is considered to be Low to Medium.

Tidal (River) Flooding

- 10.4.19. The Flood Map for Planning generally defines the entire site as Flood Zone 3, at High risk of flooding, impacted by a 1 in 200 year tidal flood event. Tidal flood risk at the Site is associated with the tidally influenced River Trent (there are also fluvial sources of flooding to consider – see Fluvial Flooding section above).
- 10.4.20. The Flood Map for Planning also highlights flood defences at the site and defines the site as an area that benefits from a 'reduction in risk of flooding from rivers and sea due to defences'. The Flood Map for Planning is shown in Figure 10.1.
- 10.4.21. The Risk of Flooding from Rivers and Seas dataset was released in January 2025 and is expected to be used to update the Flood Map for Planning in Spring 2025. A plan of the Risk of Flooding from Rivers and Seas dataset is included in the Flood Risk Assessment appended to this PEIR. The dataset predicts the vast majority of the site to be at risk of flooding. Large areas are predicted to have a High likelihood of flooding, predicted to be impacted by a 1 in 30 year flood event.
- 10.4.22. In addition to the datasets discussed above, the EA have provided detailed hydraulic model data for the Tidal Trent. Information provided by the EA is included in the Flood Risk Assessment appended to this PEIR.
- 10.4.23. During a worst-case 1 in 1000 year flood event, the Tidal Trent model predicts flood levels on site to range from approximately -1mAOD to 2.2mAOD. Ground levels on site as defined by the topographic survey are generally in the approximate range of -0.2mAOD and 2.6mAOD.
- 10.4.24. Mitigation measures on site are proposed to include raising the lowest edge of all solar panels and infrastructure above the predicted 1 in 1,000 year flood levels from the Tidal Trent Model (see above). The predicted tidal flood levels vary across the Site and as such, the level to which solar panels and infrastructure are raised across the Site may vary. Proposed raising has been

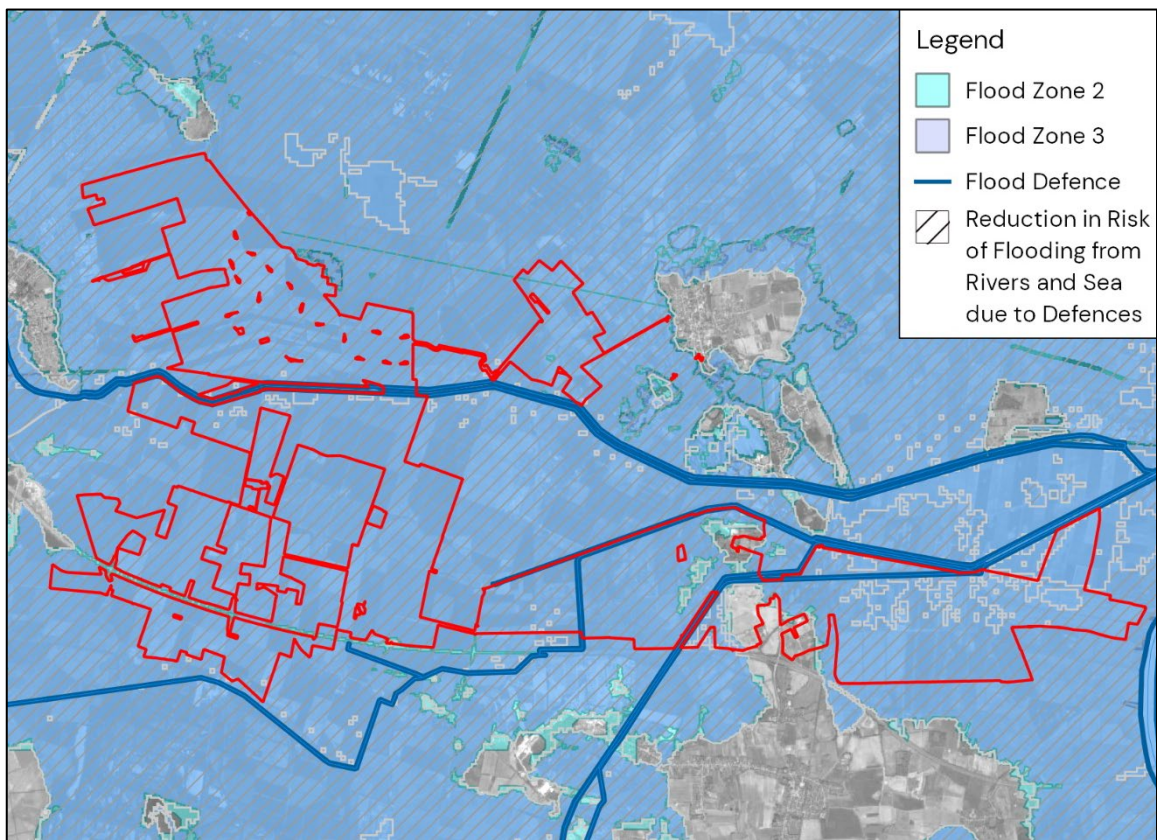
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defined in mAOD as requested by the EA. A plan of the proposed raising is included in the Flood Risk Assessment appended to this PEIR.

10.4.25. It should be noted that proposed raising on site has been defined by the most recent Tidal Trent model data from 2023. This represents an update from the issue of the draft PEIR.

10.4.26. With the proposed mitigation measures in place, the Scheme will be designed to remain safe and operational during a 1 in 1000 year tidal flood event, as informed by detailed hydraulic data from the EA, plus an allowance for freeboard. The tidal flood risk to the Scheme is therefore considered to be Low.

Figure 10.1 – Flood Map for Planning



Surface Water Flooding

10.4.27. The Risk of Flooding from Surface Water (RoFSW) dataset shows that the majority of the site is not predicted to be impacted by a 1 in 1000 year rainfall event and has a Very Low Risk likelihood of surface water flooding. The dataset also highlights areas of High to Low likelihood, predicted to be impacted by a 1 in 30 and 1 in 1000 year rainfall event, respectively, spread across the site. These at-risk areas are generally isolated and associated with surface water arising within the site boundary itself.

10.4.28. Surface water flood depths on site are generally not predicted to exceed 300mm on site. The lowest edge of proposed solar panels and infrastructure in areas at risk of surface water flooding

will be raised above the predicted depths. This will ensure that the proposed panels will be safe over their lifetime and that surface water flow patterns on site will not be impacted.

- 10.4.29. In addition to the above mitigation measures, surface water arising within the Site boundary itself will be managed with the proposed surface water drainage strategy for the Scheme.
- 10.4.30. The Risk of Flooding from Surface Water extents and depths datasets are included in the appended Flood Risk Assessment.
- 10.4.31. Overall, with the proposed mitigation measures and drainage strategy in place, it is considered that the site is at Low risk of flooding from surface water.

Groundwater Flooding

- 10.4.32. BGS data show that the bedrock geology at the Site is split between 'Sherwood Sandstone Group – Sandstone' in the west and 'Mercia Mudstone Group – Mudstone' in the east (see Figure 10.2). It is considered likely that the sandstone in the west will be permeable, whilst the mudstone in the east is expected to be impermeable. There is potential for groundwater emergence where these two bedrocks meet.
- 10.4.33. The hydrogeology aquifer classification defines the western half of the Site (where sandstone is generally the underlying bedrock) as a highly productive aquifer, whilst the eastern half (generally underlain by mudstone) is defined as a low productivity aquifer (see Figure 10.3). As with having two different bedrocks, there is potential for groundwater emergence where these two aquifer types meet.
- 10.4.34. BGS also record a wide range of superficial deposits at the site. These deposits include: 'Alluvium – Clay, Silt, Sand and Gravel', 'Hemingbrough Glaciolacustrine Formation – Clay, Silty', 'Warp – Clay and Silt', 'Peat', 'Glaciofluvial Deposits, Devensian – Sand and Gravel', 'Brighton Sand Formation – Sand, Silty' and 'Sutton Sand Formation – Sand'. Any clay superficial deposits across the site are expected to restrict groundwater emergence.
- 10.4.35. Given the significant number of watercourses on Site and in the surrounding area, it is considered unlikely that groundwater would rise above the fluvial/tidally influenced flood levels on Site.
- 10.4.36. Site topography is also not considered conducive to groundwater flooding – any ground water to emerge is generally expected to follow site topography and fall towards the watercourses on Site without accumulating to significant depths.
- 10.4.37. Overall, given the above, although there is potential for groundwater emergence on Site, the risk is considered to be Low.

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Figure 10.2 – BGS Bedrock Geology

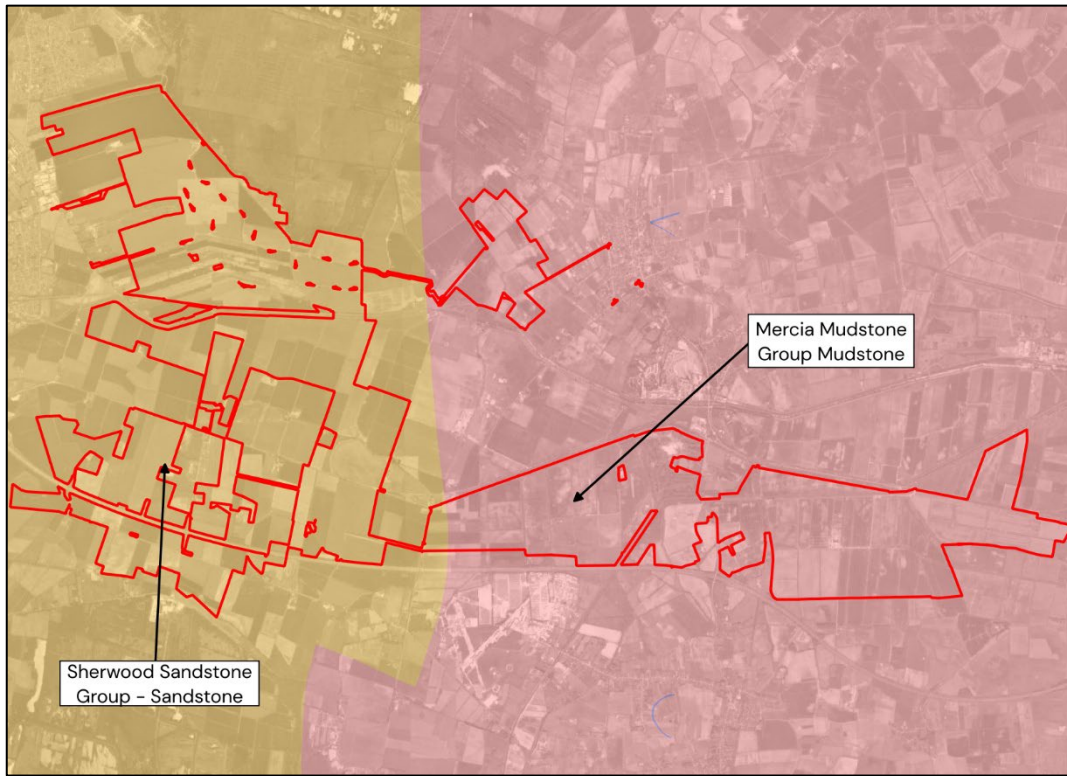
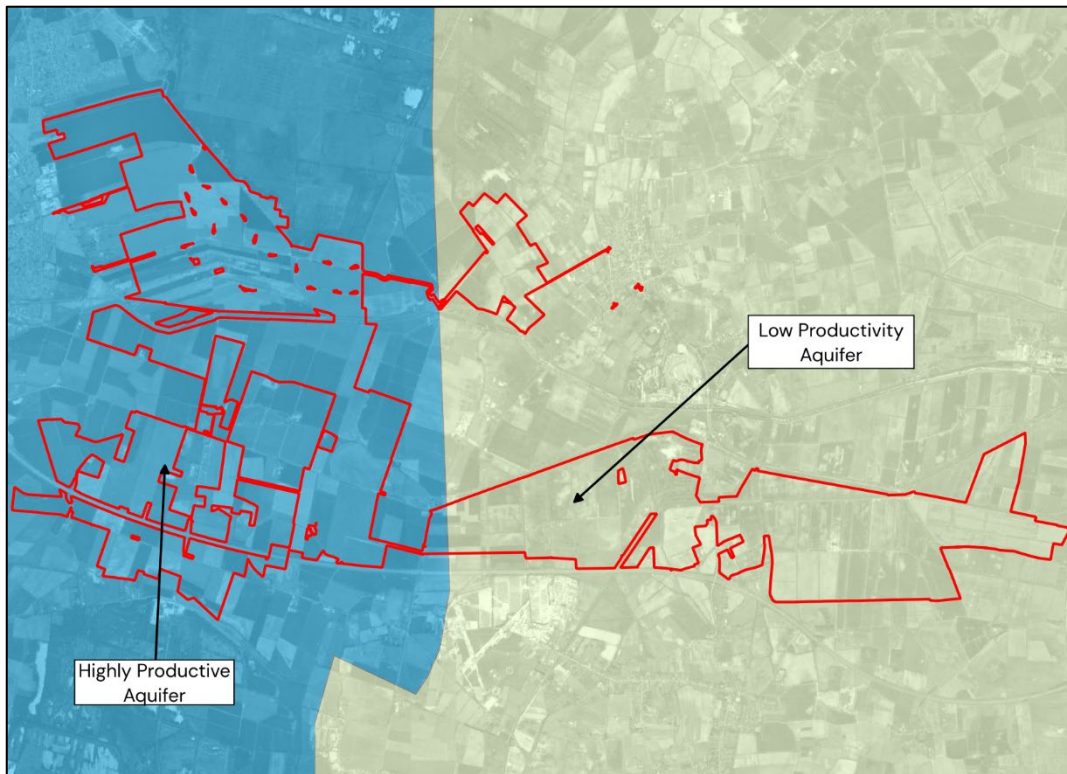


Figure 10.3 – Hydrogeology Aquifer Classification



Sewer Flooding

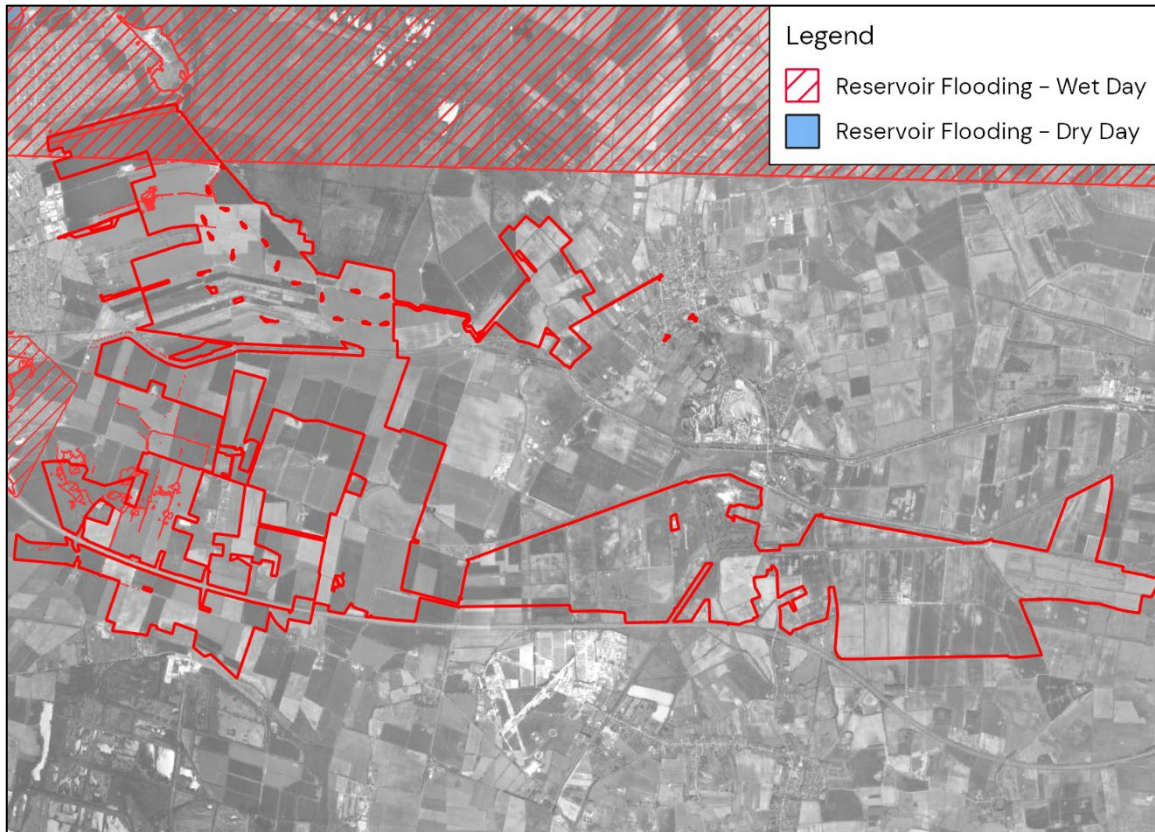
- 10.4.38. The Doncaster MBC Level 1 Strategic Flood Risk Assessment (2015) interactive mapping does not show any recorded flood events from the Severn Trent Water Floods Register that impact the Site.
- 10.4.39. The North and North East Lincolnshire Strategic Flood Risk Assessment (2022) states that 'sewerage drainage problems' have been mapped on their 'interactive maps'. These interactive maps have not been made available at the time of writing this report and as such, no records of sewer flooding at the site have been found.
- 10.4.40. As the Site is entirely greenfield, it is unlikely that there is an existing underground drainage network located within the Site boundary. Additionally, any flood water from sewers in the close vicinity of the Site would follow local topography and would not be expected to accumulate within the Site boundary.
- 10.4.41. The risk of flooding from sewers to the Site is therefore considered to be Low.

Flooding from Artificial Sources

- 10.4.42. The EA's Reservoir Flood Extents shows the extent of flooding should a catastrophic breach occur during a 'wet day' when local rivers had already overflowed their banks and highlights parts of the site to be at risk during a 'wet day' (see Figure 10.4). The Site is not shown to be at risk during a 'dry day' when local rivers are not overflowing their banks.
- 10.4.43. The North and North East Lincolnshire Strategic Flood Risk Assessment (2022) states that "reservoir flooding is extremely rare in the UK due to very strict regulations and mandatory assessments". As such, the likelihood and risk of a catastrophic reservoir breach occurring at the site is considered to be Very Low.
- 10.4.44. The Stainforth and Keadby Canal runs through the centre of the Site, roughly in line with the South Humberside Main Railway Line. The North and North East Lincolnshire Strategic Flood Risk Assessment (2022) advises that this canal is managed by British Waterways and only highlights flood risk associated with the canal where it is influenced by the River Ouse and River Don, which are both located a notable distance from the site.
- 10.4.45. There are no other artificial sources of flooding or canals located in the vicinity of the Site that would present a flood risk.
- 10.4.46. The Site is therefore considered to be at Low risk of flooding from artificial sources.

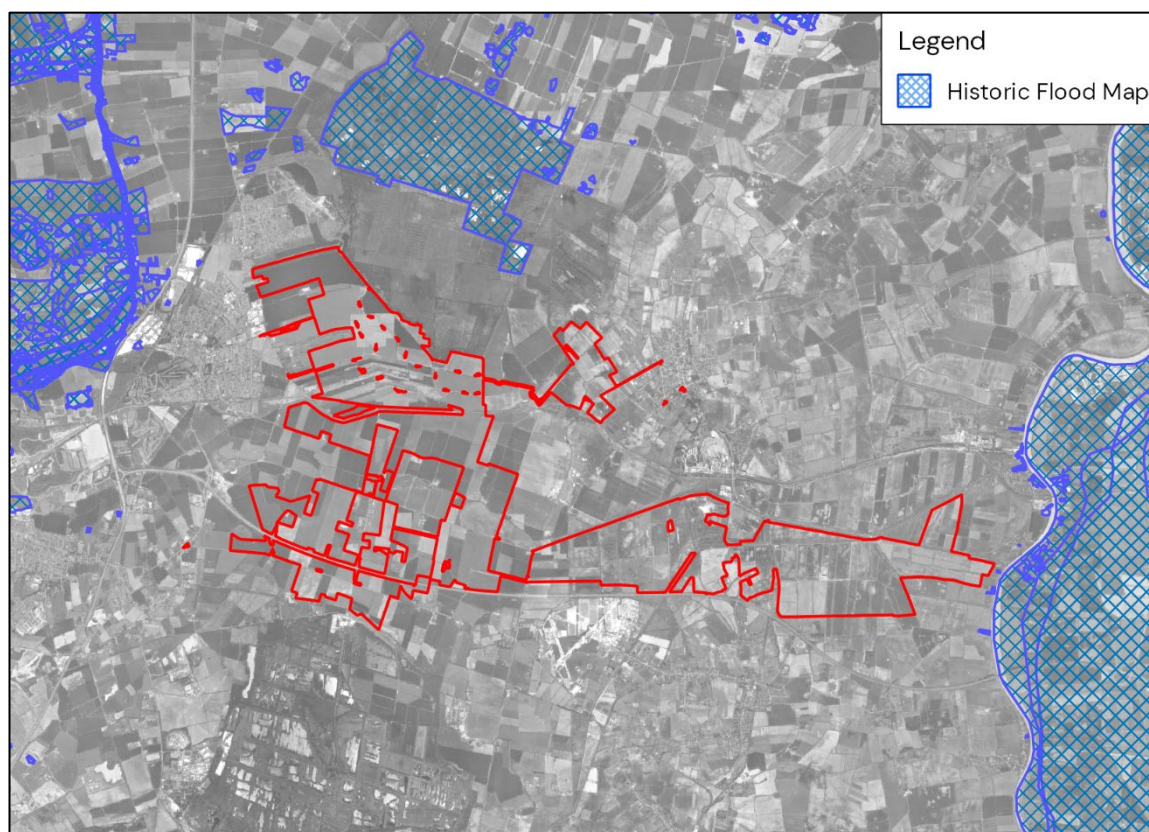
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Figure 10.4 – EA Reservoir Flood Extents

**Historic Flooding**

- 10.4.47. The EA's Recorded Flood Outlines dataset does not record any historic flood events impacting the Site. The nearest recorded historical events are located approximately 1.5km north of the northern end of the Site, 1.7km east of the easternmost Site parcel and 2.3km west of the site (see Figure 10.5).
- 10.4.48. The Doncaster MBC Level 1 Strategic Flood Risk Assessment (2015) (covering the western half of the Site) states that "DMBC have limited records regarding any flood incidents related to fluvial or tidal flooding" and do not record any historic flood events impacting the Site.
- 10.4.49. The North and North East Lincolnshire Strategic Flood Risk Assessment (2022) (covering the eastern part of the site) refers to the EA's mapping discussed above when discussing historical flooding in the region and as such, does not highlight any site specific historic flood events.
- 10.4.50. Overall, the historic flood risk to the Site is considered to be Low.

Figure 10.5 – EA Historic Flood Map



10.5. Assessment of Likely Significant Effects

- 10.5.1. The likely significant effects of the Scheme during decommissioning are likely to be similar to those encountered during the construction phase due to the operations being the same. Therefore, those effects considered for construction below are similarly expected during the decommissioning phase.

Construction

Effects on Flood Risk and Drainage

- 10.5.2. There is the potential for mud and debris arising from the construction works to enter the existing surface water / land drainage system, causing blockages and restricting flow. This could result in localised flooding on the Site, especially after heavy or prolonged rainfall resulting in a potential risk to people and property.
- 10.5.3. The sensitivity of construction workers and equipment to mud and debris blockages is considered to be **Medium**. The potential for mud and debris to block drainage networks is considered to have an effect of **Low Adverse** magnitude on flooding to the Site itself and surrounding area. The significance of effect is **Minor to Moderate Adverse**.
- 10.5.4. Temporary increases in impermeable area on Site during construction has the potential to increase flooding both on and off Site. Temporary hard standing or compacted areas could

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result in rapid surface water runoff to local watercourses or cause an increase in overland flow and localised flooding.

- 10.5.5. The effects of construction on the impermeable area on site would be temporary and short term. The sensitivity of construction workers and equipment is considered to be **Medium** with the temporary effects considered to have an effect of **Medium Adverse** magnitude to people working within the Site. A Medium Adverse magnitude has been defined as the effects of additional temporary hardstanding on site during construction could occur at a time as high flood risk on Site (e.g. during a large storm event). The significance of effect is **Moderate Adverse**.

Effects on Water Resources

- 10.5.6. During construction, temporary access tracks are expected to be required on Site. These access tracks are expected to be constructed with compacted self-binding aggregate fill materials. Access tracks would therefore form long linear features that, in the event of rainfall, could become temporary drainage routes for surface water.
- 10.5.7. There is also the potential for soil erosion and movement of sediment from shallow road excavations. It would therefore be necessary to ensure that pollution prevention measures within the Site are appropriate to prevent migration of silt to surface watercourses and groundwater bodies during construction.
- 10.5.8. The sensitivity of surface water and groundwater bodies to silt contamination is considered to be **Medium**. Without mitigation, potential effects are considered of a **Medium** magnitude. The significance of the effect is **Moderate Adverse** on a temporary short-term basis.
- 10.5.9. During construction, fuel, hydraulic fluids, solvents, grouts, paints and detergents and other potentially polluting substances will be stored and / or used on the Site. Leaks and spillages could pollute groundwater bodies through infiltration and pollute surface watercourses via overland flow. To allow such substances to enter a watercourse could be in breach of regulation 38(1) of the Environmental Permitting (England and Wales) Regulations 2016, therefore, measures to control the storage, handling and disposal of such substances will be put in place prior to and during construction. The proposed construction compound locations are shown on the proposed site layout.
- 10.5.10. The sensitivity of surface water and groundwater bodies to spillages, leakages and pollutants is considered to be **Medium**. Without mitigation measures spillages of chemicals/fuel stored could cause short term, temporary effects of a **Medium** magnitude on the local watercourses (medium importance). The significance of effect is **Moderate Adverse** on a temporary short-term basis.

Operation

Effects on Flood Risk and Drainage

- 10.5.11. An increase in the volume of water discharged to local watercourses as a result of increased hard standing areas has the potential to increase the flood risk to areas downstream of the Scheme. Increased impermeable areas on site are generally associated with proposed infrastructure on Site rather than proposed solar panels which are generally considered to have a negligible impact on surface water drainage patterns.

- 10.5.12. The sensitivity of people and property to increased flood risk during operation is considered **Medium**. Whilst the effects would be temporary and short term, this is considered to have an effect of **Medium Adverse** magnitude to people and property (considered to be up to very high importance) occurring at time of high flood risk (e.g. during a large storm event). The significance of effect is **Major Adverse**.

Effects on Water Resources

- 10.5.13. Spillages of pollutants (e.g. oil) on access tracks from maintenance vehicles could be transported to watercourses via runoff, where they could impact upon ecological life, or infiltrate into the ground.
- 10.5.14. The receptors at risk are surface watercourses and groundwater bodies which are considered to be of **Medium** sensitivity to operational pollutants. Without mitigation the increase in highway spillage risk is considered to have an effect of a **Low Adverse** magnitude. The significance of effect is **Minor Adverse** which is considered permanent if left unmitigated.

RWE Underground Export Cable Route

- 10.5.15. The proposed layout plan identifies an illustrative corridor for the underground export cable route based on the Applicant's current assumptions as to the possible location for the National Grid substation. This falls within the overall National Grid Substation and RWE Underground Export Cable Route Assessment Area.
- 10.5.16. As the cable route will be a buried service, it will have no impact on existing flood risk and drainage. The impacts of the cable route on flood risk and drainage are considered applicable to the full National Substation and RWE Underground Export Cable Route Assessment Area.
- 10.5.17. The proposed construction method for the cable route will be considered at a later stage, with the potential for directional drilling where interfacing with existing watercourses to ensure no significant impacts on water resources. Further consideration of the cable route and its potential impact upon water resources, flood risk and drainage will be included in the Environmental Statement. When also considering the RWE Underground Export Cable Route, the conclusions of this chapter remain the same, with no significant effects on water resources, flood risk or drainage identified.

Zone of Influence

- 10.5.18. A 2km Zone of Influence has been assessed within the chapter. No additional receptors or significant effects have been identified with this 2km extent which are considered to require any further assessment.

10.6. Mitigation, Enhancement and Residual Effects

Mitigation by Design

- 10.6.1. As noted above, there are several adverse effects that may occur during the construction and operational phases of the Site. These effects could impact water resources and flood risk and drainage on Site and elsewhere. In order to mitigate these potential effects, mitigation measures are proposed on site. Details of mitigation by design measures proposed on site are discussed below.

Water Resources

Effects on Water Resources – Operation

- 10.6.2. Where practical, at detailed design stage it is recommended that surface water runoff from proposed equipment and access tracks will be directed towards SuDS features that would provide water quality treatment to mitigate the risk of water pollution on Site. Contributions could be made from permeable surfacing, wildflower planting and linear infiltration trenches.
- 10.6.3. Future maintenance of any proposed SuDS on Site will be privately managed by the Applicant. An overview of possible SuDS features on site, and indicative future maintenance is provided in the Flood Risk Assessment and Drainage Strategy for the development which is appended to this PEIR. It is concluded that the SuDS expected to be implemented on Site (to be confirmed during detailed design) would provide sufficient water quality treatment to mitigate the risk of surface water pollution on Site.

Effects on Flood Risk and Drainage – Operation

- 10.6.4. A surface water drainage strategy will be implemented on Site. Details of the proposed drainage are included in the Flood Risk Assessment and Drainage Strategy for the Site which is appended to this PEIR. Full details of the proposed surface water drainage strategy will be confirmed during detailed design, but the strategy will be designed to ensure surface water runoff rates from the Site do not increase as a result of the Scheme..
- 10.6.5. It's also noted that solar panels proposed on Site will have their lowest edge raised above the ground. Details of the proposed raising are included in the Flood Risk Assessment and Drainage Strategy for the development which is appended to this PEIR. As the proposed solar panels will be raised, surface water across the vast majority of the site will continue to drain as per the existing conditions.
- 10.6.6. Overall, following the allocation of the mitigation measures through the DCO, the residual effects of the Scheme during operation are considered to be **Negligible**.
- 10.6.7. Mitigation is summarised in Table 10.6.

Effects on Water Resources, Flood Risk and Drainage – Construction

- 10.6.8. Where necessary a temporary drainage network will be installed prior to the commencement of construction and a maintenance plan, confirmed through a Construction Environmental Management Plan (CEMP), should be maintained throughout the duration of construction works on the Site. The drainage systems will be designed to good practice standards detailed within the CIRIA SuDS manual C753.
- 10.6.9. A temporary construction drainage system will be developed to prevent silt-laden runoff from entering surface water drains, watercourses and ponds without treatment (e.g. earth bunds, silt fences, straw bales, or proprietary treatment) under any circumstances.
- 10.6.10. Construction SuDS (such as temporary attenuation) may also be used during construction if necessary.
- 10.6.11. During the construction phase easements of 9m on both bank sides should be preserved adjacent to all receptors to ensure that there is a sufficient buffer from the sensitive receptor to the construction stages of development.

10.6.12. Following the implementation of mitigation measures the residual effects during construction are considered to be **Negligible**.

10.6.13. Mitigation is summarised in Table 10.6.

Table 10.6: Mitigation

Ref	Measures to avoid, reduce or manage any adverse effects and/or deliver beneficial effects	How measures is proposed to be secured	
		By Design	By Requirement within the DCO
1	Include silt management and control measures in the CEMP.		X
2	Ensure measures to control the storage, handling and disposal of pollutants are put in place prior to and during construction included in the CEMP.		X
3	Any proposed drainage features such as permeable surfacing, infiltration trenches and wildflower planting should be designed to good practice standards	X	
4	Maintaining the existing surface water run-off regime by utilising permeable surfacing for the Site access, by raising proposed solar panels and infrastructure and by maintaining species rich grassland below the proposed solar panels.	X	
5	Raising panels above the design event flood water levels plus and allowance for freeboard.	X	

Residual Effects

10.6.14. With the embedded design measures described above and those within the CEMP, all identified potential effects have been assessed as being of negligible significance, and therefore not significant in terms of the EIA Regulations. No further mitigation is proposed.

10.7. Cumulative and In-Combination Effects

10.7.1. There are no known other sites that require consideration in terms of the cumulative and in-combination effects. It is also noted that each individual site should appropriately manage water resources, flood risk and drainage as to not have an impact on site or elsewhere.

PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

Water Resources

Table 10.7: Summary of Effects, Mitigation and Residual Effects

Receptor / Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Significance of Effects	Mitigation / Enhancement Measures	Residual Effects
Watercourse / Ground	Mud and debris Flood Risk	Temporary	Medium	Low	Minor / Moderate Adverse	Detailed in the CEMP	Negligible
Watercourse	Impermeable area increasing Flood Risk	Temporary	Medium	Medium	Moderate Adverse	Detailed in the CEMP	Negligible
Watercourse / Ground	Pollutants (oils, etc)	Temporary	Medium	Medium	Moderate Adverse	Detailed in the CEMP	Negligible
Watercourse	Sediment movement	Temporary	Medium	Medium	Moderate Adverse	Detailed in the CEMP	Negligible
Watercourse	Impermeable area increasing Flood Risk	Permanent	Medium	Medium	Moderate Adverse	Detailed in the Flood Risk Assessment / Drainage Strategy including O&M Manual for maintenance	Negligible

PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

Water Resources

Watercourse / Ground	Pollutants (oils, etc)	Permanent	Medium	Medium	Moderate Adverse	Detailed in the Flood Risk Assessment / Drainage Strategy including O&M Manual for maintenance	Negligible
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