



One Earth Solar Farm

Volume 6.0 Environmental Statement [EN010159]

Volume 3: Technical Appendices Supporting ES Volume 2

Appendix 7.4: Stage 1 Water Framework Directive Screening Assessment - Tracked

October 2025

Document Reference: EN010159/APP/6.21.2

Revision 03

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009
- Reg 5 (2) (a)

Report

One Earth Solar Farm

Water Framework Directive - Screening Assessment

For One Earth Solar Farm Ltd

~~12 September 2025~~ ~~26 September 2025~~ 14 October 2025

Document Control

Project Title: One Earth Solar Farm

Project Number: 14529A

Client: One Earth Solar Farm Ltd

Principal Contact: [REDACTED] (Pershing Consultants)

Document Title: Water Framework Directive - Screening Assessment

Document Number: 14529A-~~30-R20-02~~30-R20-03

Prepared By: [REDACTED]

Reviewed By: [REDACTED] (Technical Director)



Logika Group is a trading name of Air Quality Consultants Limited (Companies House Registration No: 02814570), Noise Consultants Limited (Companies House Registration No: 10853764) and Logika Consultants Limited (Companies House Registration No: 12381912).

This document has been prepared based on the information provided by the client. Air Quality Consultants Ltd, Noise Consultants Ltd or Logika Consultants Ltd do not accept liability for any changes that may be required due to omissions in this information. Unless otherwise agreed, this document and all other Intellectual Property Rights remain the property of Air Quality Consultants Ltd, Noise Consultants Ltd and/or Logika Consultants Ltd. When issued in electronic format, Air Quality Consultants Ltd, Noise Consultants Ltd or Logika Consultants Ltd do not accept any responsibility for any unauthorised changes made by others.

The Logika Group all operate a formal Quality Management System, which is certified to ISO 9001:2015, and a formal Environmental Management System, certified to ISO 14001:2015.

When printed by any of the three companies, this report will be on Evolve Office, 100% Recycled paper.

3rd Floor St Augustine's Court, 1 St. Augustine's Place, Bristol, BS1 4UD Tel: +44(0)117 974 1086

24 Greville Street, Farringdon, London, EC1N 8SS Tel: +44(0)20 3873 4780

First Floor, Patten House, Moulders Lane, Warrington WA1 2BA Tel: +44(0)1925 937 195

8-9 Ship St, Brighton and Hove, Brighton BN1 1AD Tel: +44(0)20 3873 4780

Avenue du Port, 86c Box 204, 1000 Bruxelles Tel: +44(0)20 3873 4780

Contents

1	Introduction	1
2	WFD Screening Approach and Background	5
3	Screening Assessment	8
4	Operational Embedded Measures	18
5	Construction Mitigation	21
6	Decommissioning Mitigation	26
7	Conclusions	27
8	Appendices	28
A1	Topographic Survey	1
A2	Development Proposals	2
A3	Environment Agency Meeting Minutes	3
1	Introduction	1
2	WFD Screening Approach and Background	5
3	Screening Assessment	8
4	Operational Embedded Measures	18 16
5	Construction Mitigation	21 19
6	Conclusions	26 24
7	Appendices	27 25
A1	Topographic Survey	1
A2	Development Proposals	2
A3	Environment Agency Meeting Minutes	3

Tables

Table 3-1: Summary of Lower Trent Erewash - Secondary Combined Water Body Information	9
Table 3-2: Summary of Trent from Carlton on Trent to Loughton Drain Water Body Information	11
Table 3-3: Summary of Fledborough Beck Catchment (tributary of Trent) Water Body Information	13 13 12
Table 3-4: Summary of Tuxford Beck Catchment (tributary of the North Beck) Water Body Information	14 14 13
Table 3-5: Summary of North Beck Catchment (tributary of Trent) Water Body Information	15 15 14
Table 3-6: Summary of Sewer Drain Catchment (tributary of Trent) Water Body Information	16 16 15

Figures

Figure 1-1: Site Location Plan	2
Figure 2-1: Main Rivers and Ordinary Watercourses within Study Area	6
Figure 3-1: Groundwater Catchment and Groundwater Body Extent	8
Figure 3-2: Main River and Existing Watercourses	10

1 Introduction

1.1 Overview and Aims

Logika Group Ltd were commissioned by One Earth Solar Farm Ltd to prepare a Water Framework Directive (WFD) Screening Assessment to accompany the planning application for the One Earth Solar Farm Project.

The aims of this WFD Screening Assessment are to identify the extent to which the Proposed Development is likely to affect water bodies. In undertaking this, context is provided to the overall Proposed Development, likely works to existing watercourses/waterbodies, and a summary of the baseline conditions is provided of the existing watercourses/waterbodies.

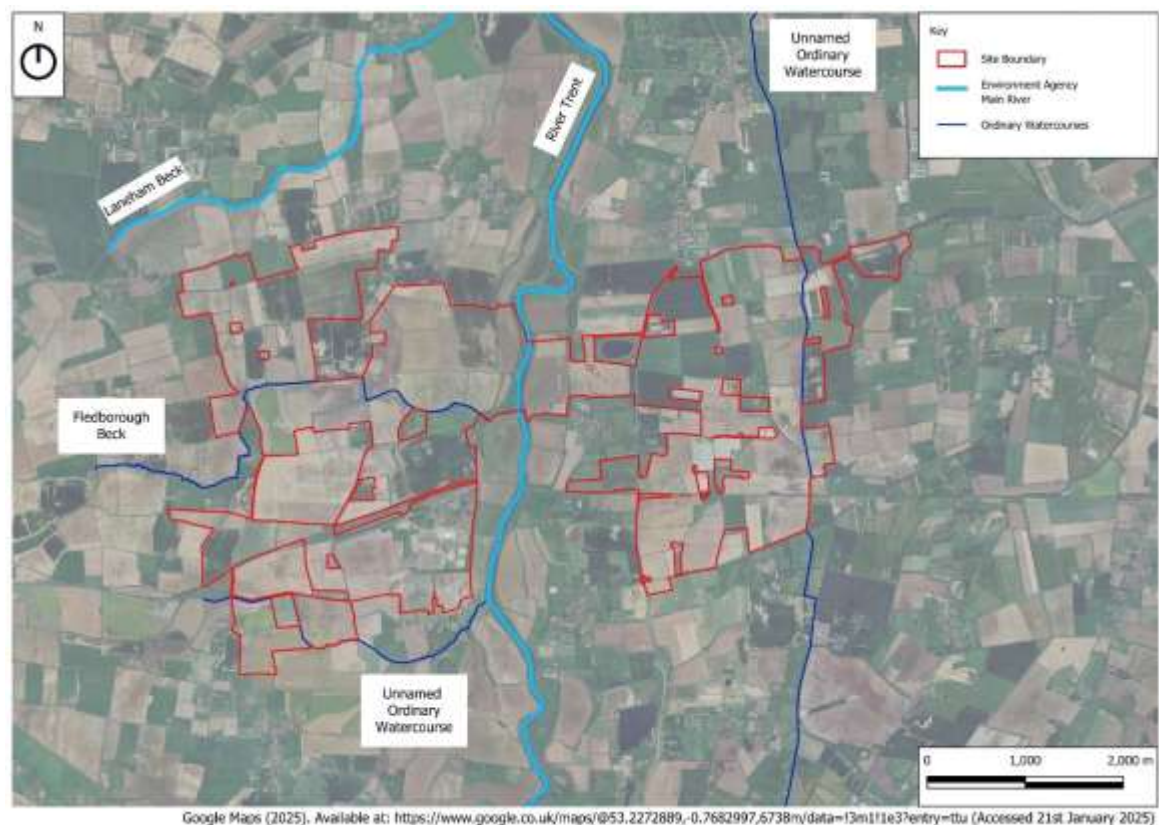
Furthermore, embedded mitigation within the design and construction are set out, keeping in mind the overarching aims of the WFD, to ensure that the Proposed Development will not:

- Cause or contribute to deterioration of status; or
- Jeopardise the water body achieving good status.

1.2 Scheme Background

The site (hereafter referred to as 'the Site') covers an area of approximately 1,409 hectares (ha) and is located across two county boundaries. Approximately 1,203ha of the Site lies within Nottinghamshire County Council and the remaining 206ha is located within Lincolnshire County Council.

The Site currently comprises agricultural fields located to the east and west of the River Trent which bisects the Site, flowing from south to north. Hedgerows, trees and woodland form the boundaries to many of the fields within the Site. The Proposed Development Site boundary is shown in **Figure 1-1**.

Figure 1-1: Site Location Plan

A topographic survey was carried out by Above Surveying Ltd and is included in **Appendix A1**.

Given the scale of the Site, ground levels vary considerably across the area. The highest elevation is at approximately 27m Above Ordnance Datum (AOD) east of the River Trent and the lowest elevation is approximately 4.5m AOD along the Trent riverbanks. Ground levels typically fall towards the ordinary watercourses and main river within the Site.

1.3 Development Proposals

The Proposed Development comprises the construction, operation and maintenance, and decommissioning of a solar (PV) array electricity generating facility. The project includes solar PV panels, Battery Energy Storage Systems (BESS), onsite sub-stations, and associated grid connection infrastructure which will allow for the generation and export of electricity to the High Marnham sub-station. The Applicant has secured a connection agreement with National Grid which will allow export and import up to 740 megawatts (MW) of electricity to the High Marnham sub-station.

The development proposals are included in **Appendix A2**. For further information regarding the Proposed Development, refer to **ES Volume 1, Chapter 5: Description of the Proposed Development [EN010159/APP/6.5]**.

1.4 Anticipated Works to Existing Watercourses

As part of the development proposals, any works to the existing watercourses are to be limited, however it is anticipated that the following will be undertaken:

- Proposed surface water drainage outfalls from areas of significant hardstanding (such as the sub-station and battery storage areas). Surface water discharges from these areas will be restricted in line with relevant policy, with treatment provided (discussed further in Section 4).
- Bridging over watercourses to facilitate access. These have been kept to a minimum and any openings required will be sized accordingly to ensure there would be no constraint to flows.
- Two artificial otter holts are proposed on the ditch network, and a new ditch is proposed in the ecological mitigation area (floodplain grazing marsh) near the River Trent which mimics a historic alignment.
- Ongoing management of drainage ditches including the clearance of any silt build-up as required, with the aim of clearing no more than one third of each ditch in each year, and from one bank/side only. Additionally, this will include bankside vegetation management every other year (in autumn), alternating from one bank to the opposite bank, maintaining vegetation cover all year round.

In addition to the elements noted above, there will be a need for cables to cross beneath the watercourses in a number of locations.

To ensure that access and ecological corridors are maintained, it is proposed that the following buffers will be provided between the top of bank of watercourses and any built development (panels, sub-stations, inverters and battery storage).

- A minimum 10m buffer from all ordinary watercourse and field drains/ditches, (in excess of the 9m required within Trent Valley Internal Drainage Board's Byelaws).
- A minimum 16m buffer from the River Trent (main river) to any built development (as described above). It is worth noting that the buffers from the River Trent actually extend far beyond the 16m minimum.

1.5 Consultation and Engagement

Following responses from the Environment Agency (EA) to the Preliminary Environment Information Report (PEIR), a meeting was requested to discuss the requirement and potential scope of any WFD Screening Assessment.

It was intended that this would be discussed in a meeting held in September 2024, however, there was no specialists present from the EA to discuss water quality matters or WFD requirements. As set out in the meeting minutes (**Appendix A3**), the requirement for a WFD Assessment to be undertaken was queried and it was ultimately agreed that given there was no EA specialist available, Logika would set out specific queries which could be circulated by the EA following the meeting.

The queries noted above were set out in November 2024 and in another meeting held with the EA in January 2025, the requirement for a WFD Assessment was raised again, highlighting the submission timescales. As set out in the meeting minutes (**Appendix A3**), the EA noted that they were looking for responses to Logika's queries.

In late January 2025, the EA provided an email response (**Appendix A3**), predominantly making reference to the "*Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive*¹" guidance and indicating that screening should be undertaken in the first instance. It was

¹ [Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive - GOV.UK](#)

noted that the requirement for scoping and impact assessment can be discussed following their review of the screening.

2 WFD Screening Approach and Background

2.1 WFD Background

The Water Environment Regulations 2017 (Water Framework Directive) (England and Wales) transpose the Water Framework Directive into UK law.

The WFD protects surface waters including rivers, lakes, transitional waters, coastal waters and groundwater and its aim are:

- To enhance the status and prevent further deterioration of surface water bodies, groundwater bodies and their ecosystem.
- To ensure progressive reduction of groundwater pollution.
- To reduce water pollution, especially by Priority Substances and Certain Other Pollutants under Annex II of the Environmental Quality Standards Directive 2008/105/EC.
- To support mitigating the effects of floods and droughts.
- To achieve at least good surface water status for all surface water bodies and good chemical status in groundwater bodies by 2015 (Article 4), or good ecological potential for artificial or heavily modified water bodies.
- To support sustainable water use.

2.2 River Basin Management Plan

Each river basin district has a River Basin Management Plan (RBMP) which consists of a collection of documents that describe how waters are managed, together with information about the river basin district in data tables and maps.

The aim of the river basin management plans is to enhance nature and the natural water assets that are the foundation of everyone's wealth, health and wellbeing, and the things people value, including culture and wildlife.

2.2.1 Humber River Basin Management Plan

The Site lies within the Humber RBMP² and the environmental objectives covered by the plan are:

- Preventing deterioration of the status of surface waters and groundwater.
- Achieving objectives and standards for protected areas.
- Aiming to achieve good status for all water bodies.
- Reversing any significant and sustained upward trends in pollutant concentrations in groundwater.
- Cessation of discharges, emissions and losses of priority hazardous substances into surface waters.

² [Humber river basin district river management plan: updated 2022 - GOV.UK](#)

- Progressively reducing the pollution of groundwater and preventing or limiting the entry of pollutants.

2.3 WFD Screening

Screening should identify the extent to which the proposed development is likely to affect water bodies. Where impacts are 'screened out' from further assessment, this should be clearly justified.

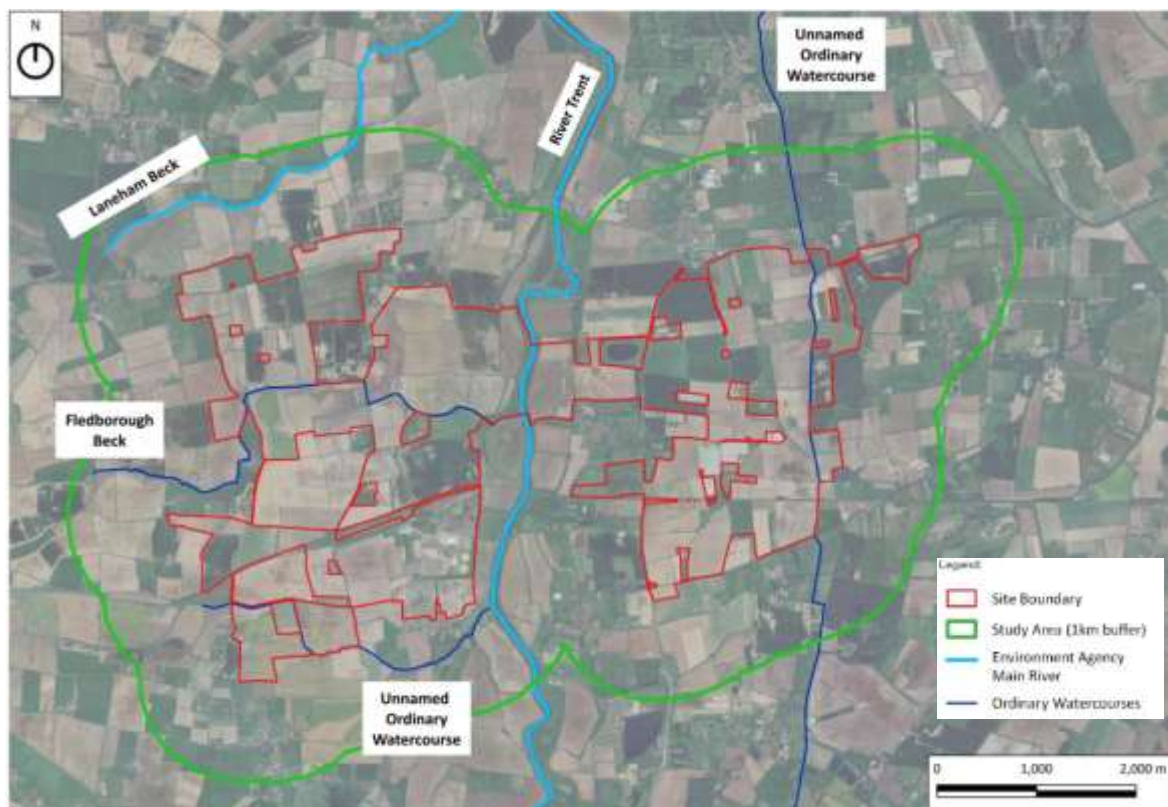
The screening stage should:

- Show all relevant WFD water bodies on a map or plan;
- Identify the zone or zones of influence based on specific activities and/or characteristics of the proposed development that could affect the identified water bodies; and
- Identify any specific activities and/or characteristics of the proposed development that have been screened out and why.

2.3.1 Approach to Screening

The Screening Assessment set out within Section 3 considers the baseline condition of the groundwater bodies within the Study Area set out in **Figure 2-1** below and **Figure 3-2**.

Figure 2-1: Main Rivers and Ordinary Watercourses within Study Area



Given the nature of hydrology and hydrogeology, it is difficult to accurately define a Study Area as water is a flowing element. Therefore, in the absence of any specific guidance relating to solar developments and in accordance with Design Manual for Roads and Bridges (DMRB) LA 113 (2020), a 1km buffer has been considered appropriate, as sufficient distance is provided to encompass

catchments associated with the Site and to enable the deposition of silts in overland flows and dilution of any concentrated pollutants. Any impacts to waterbodies beyond 1km from the Site are considered to be negligible.

Given that the proposed submission is outline only, it is difficult to confirm with certainty what the development proposals associated with the existing watercourses/waterbodies will be. Prior to detailed design, it is similarly difficult to clarify the associated activities, as construction approaches are not confirmed and a contractor is not on board at this stage.

With the above in mind, the following approach has been taken to the Screening Assessment:

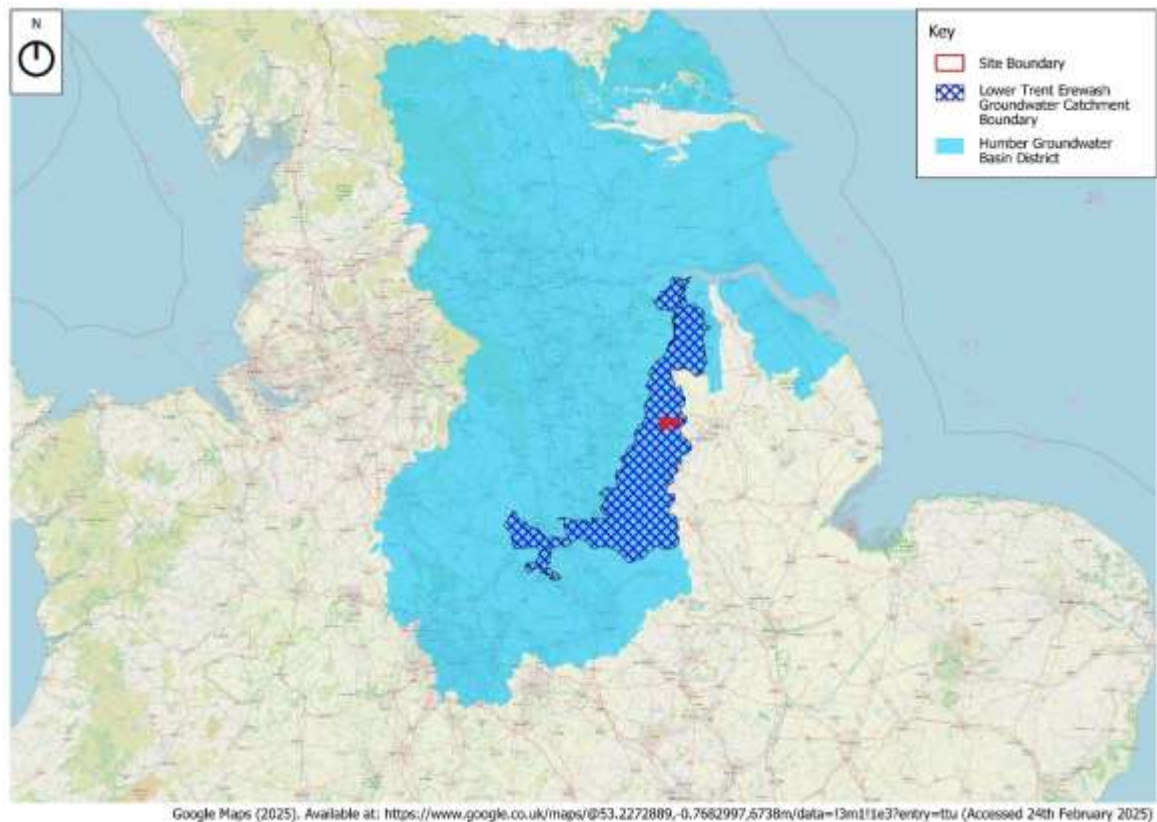
- The baseline conditions of existing waterbodies / watercourses have been set out and reviewed.
- Embedded mitigation measures within the design and construction mitigation have been considered in relation to the proposed works to the watercourses.
- Taking into account the mitigation proposed, the resulting effect that the proposed works could have on the objectives of the WFD and RBMP have then been considered and it has been determined whether further assessment is required.

3 Screening Assessment

3.1 Groundwater

The Site lies within the Humber Groundwater Management Catchment and is within the Lower Trent Erewash - Secondary Combined Groundwater Body, both of which are illustrated in **Figure 3-1**.

Figure 3-1: Groundwater Catchment and Groundwater Body Extent



The baseline conditions of the groundwater body have been obtained from the EA catchment data explorer³ and are summarised in **Table 3-1**. As can be seen, the overall water body status is confirmed to be Good.

³ [Lower Trent Erewash - Secondary Combined | Catchment Data Explorer | Catchment Data Explorer](#)

Table 3-1: Summary of Lower Trent Erewash - Secondary Combined Water Body Information

Parameter	Detail
Water Body Name:	Lower Trent Erewash - Secondary Combined Water Body
Water Body ID:	GB40402G990300
Groundwater Management Catchment:	Humber
Waterbody Type:	Groundwater
Groundwater Area (ha):	192,440
Overall Water Body Status (2019):	Good
Target Water Body Status:	Not classified
Quantitative Status Element:	Good
Chemical Status:	Good

3.1.1 Aquifers, Source Protection Zones and Water Protected Areas

The Mercia Mudstone Group bedrock units are classified as a secondary B aquifer, with the Penarth Group classified as a secondary undifferentiated aquifer. Where superficial units are present, these are categorised as secondary A aquifers. There is a small area of secondary undifferentiated aquifer where till deposits are present between Ragnall and Darlton.

There are no groundwater SPZs within the majority of the study area. Three groundwater SPZs are present within a very localised area to the north of the Order Limits within the study area, near Dunham Bridge. The SPZs range from Zone 1 Inner Protection Zones to Zone 2 Subsurface Activity, but are all thought to be associated with Anglian Water groundwater abstractions.

There is one additional groundwater abstraction point located within the Order Limits ~~(which is indicated to be 'active' by the Environmental Database report)~~, with a further four being located within the study area, but outside the Order Limits. The abstraction location within the Order Limits is located at High Marnham Power Station, for industrial processing, however, this abstraction location is no longer active. ~~As High Marnham Power Station is no longer present, it is possible that this abstraction point is no longer in use, but the licence remains active.~~ The abstraction points that are within the study area, but outside the Order Limits, are all for general farming (spray irrigation). One of these, located near Ragnall, is listed as being using as a domestic supply, in addition to the general farming use.

Drinking Water Groundwater Safeguard Zones are established around public water supplies where additional pollution control measures are needed. The Order Limits are not located within or nearby to any Drinking Water Safeguard Zone (Groundwater).

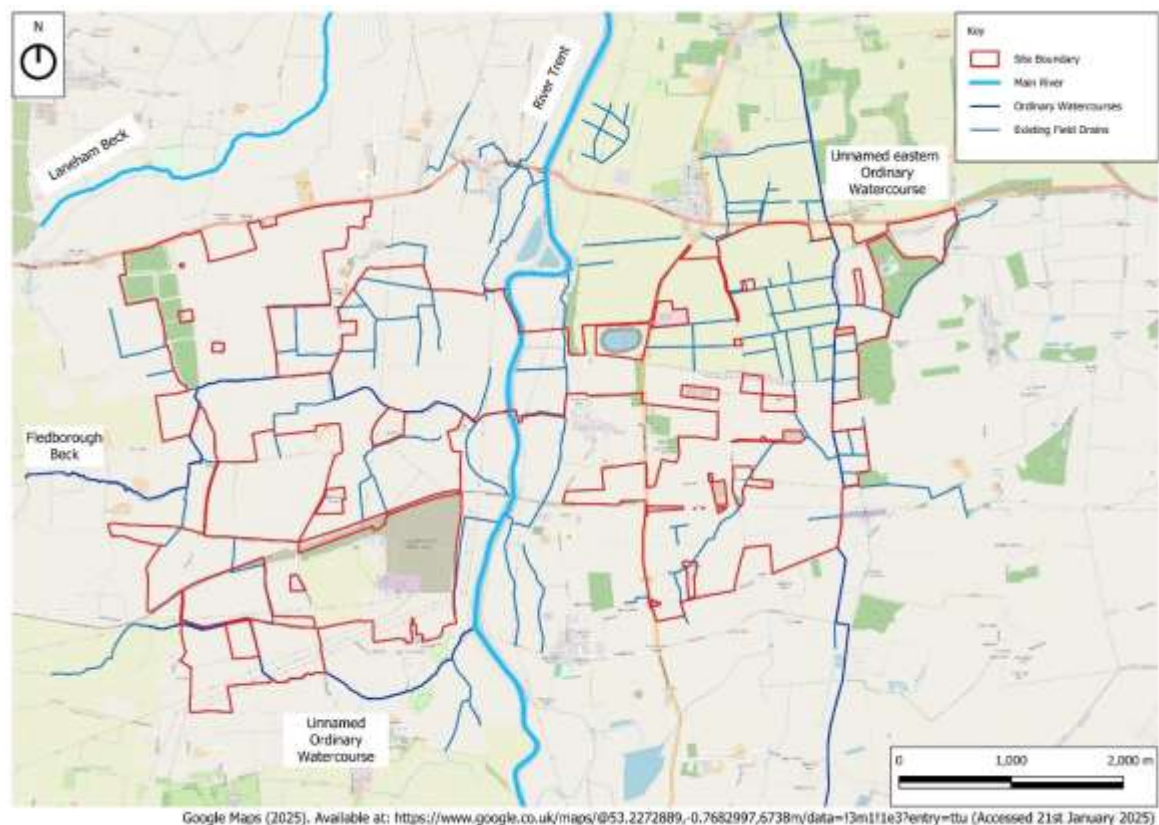
3.2 Watercourses

There are a number of existing watercourses within the Study Area. These are illustrated in **Figure 3-2** (and **Figure 2-1**) and summarised below:

- The River Trent – A main river which flows in a northerly direction through the centre of the Site.

- The Fledborough Beck – An ordinary watercourse which flows west to east through the central areas of the western parcel of the Site, before ultimately discharging to the River Trent.
- The Laneham Beck – An ordinary watercourse which flows west to east to the north west of the Site, ultimately discharging to the River Trent.
- An unnamed ordinary watercourse which flows west to east through the southern area of the western parcel of the Site. This ordinary watercourse ultimately discharges to the River Trent.
- An unnamed ordinary watercourse which flows in a northerly direction through the eastern area of the Site. This ordinary watercourse is a tributary of the Foss Dyke which ultimately connects to the River Trent approximately 4km north of the Site.
- A number of field drains and ditches within the Site itself which are ultimately in connectivity with either the ordinary watercourses noted above or the River Trent.

Figure 3-2: Main River and Existing Watercourses



The baseline conditions of the following watercourses have been assessed:

- The River Trent
- The Fledborough Beck
- The Laneham Beck
- Unnamed Ordinary Watercourse in the west
- Unnamed Ordinary Watercourse in the east

Although there are a number of existing field drains throughout the Site, these are all tributaries of the main rivers or ordinary watercourses listed below and their condition is assumed to be the same.

3.2.1 Baseline Data Collection

The watercourses noted above do not appear within the EA's Water Body Summary Table⁴ referred to within the Clearing the Water's⁵ guidance. The Cycle 3 data (available from the EA Catchment Data Explorer⁶) has therefore been used and is summarised in within the tables under the following headings.

River Trent and Unnamed Ordinary Watercourse in the West

The River Trent and the Unnamed Ordinary Watercourse in the west both lie within the catchment of the "Trent from Carlton on Trent to Laughton Drain Water Body". The unnamed ordinary watercourse in the east is also within this catchment, however this is discussed further under the following headings with regards to the Sewer Drain which is downstream of the Site.

Baseline conditions of the Trent from Carlton on Trent to Laughton Drain are summarised within **Table 3-2** below.

Table 3-2: Summary of Trent from Carlton on Trent to Laughton Drain Water Body Information

Parameter	Detail
Water Body Name:	Trent from Carlton on Trent to Laughton Drain Water Body
Water Body ID:	GB104028058480
River Basin District Name:	Humber River Basin District
Water Body Type:	River
Waterbody Total Area (ha):	15,322
Ecological Status (2022):	Moderate
Chemical Status (2019):	Fail
Target Water Body Status and Deadline:	Good by 2027 – Low Confidence
Hydromorphology Status:	Artificial
Modified Waters Designation:	Not classified
Higher Sensitivity Habitats:	None
Lower Sensitivity Habitats:	None
Phytoplankton Status:	Not classified
History of Harmful Algae:	Not classified
WFD Protected Areas within 2km:	None
Reasons for Not Achieving Good Status:	<ul style="list-style-type: none"> Transport Drainage

⁴ [wfd_water_body_summary_table_2023_update_submission.xlsx](#)

⁵ [Water Framework Directive assessment: estuarine and coastal waters - GOV.UK](#)

⁶ [England | Catchment Data Explorer](#)

Parameter	Detail
	<ul style="list-style-type: none">Sewage DischargePoor Soil ManagementUnknown (Pending Investigation)

Fledborough Beck

The extent of the Fledborough Beck within the Site, falls within the "Fledborough Beck Catchment (tributary of Trent Water Body)". Baseline conditions of the Fledborough Beck are summarised within **Table 3-3** below.

Table 3-3: Summary of Fledborough Beck Catchment (tributary of Trent) Water Body Information

Parameter	Detail
Water Body Name:	Fledborough Beck Catchment (tributary of Trent) Water Body
Water Body ID:	GB104028058290
River Basin District Name:	Humber River Basin District
Water Body Type:	River
Waterbody Total Area (ha):	1,292
Ecological Status (2022):	Moderate
Chemical Status (2019):	Fail
Target Water Body Status and Deadline:	Good by 2027 – Low Confidence
Hydromorphology Status:	Not designated artificial or heavily modified
Modified Waters Designation:	Not designated artificial or heavily modified
Higher Sensitivity Habitats:	None
Lower Sensitivity Habitats:	None
Phytoplankton Status:	Not classified
History of Harmful Algae:	Not classified
WFD Protected Areas within 2km:	None
Reasons for Not Achieving Good Status:	<ul style="list-style-type: none"> • Poor Nutrient Management • Land Drainage • Drought

Laneham Beck

The Laneham Beck is outside of the Site Boundary but is within the defined Study Area. The Laneham Beck falls within two waterbodies, namely:

- The Tuxford Beck Catchment (tributary of the North Beck)
- The North Beck Catchment (tributary of the Trent).

The baseline conditions of the Laneham Beck based on the above water bodies are summarised within **Table 3-4** and **Table 3-5** below.

Table 3-4: Summary of Tuxford Beck Catchment (tributary of the North Beck) Water Body Information

Parameter	Detail
Water Body Name:	Tuxford Beck Catchment (tributary of the North Beck) Water Body
Water Body ID:	GB104028058320
River Basin District Name:	Humber River Basin District
Water Body Type:	River
Waterbody Total Area (ha):	3,598
Ecological Status (2022):	Moderate
Chemical Status (2019):	Fail
Target Water Body Status and Deadline:	Moderate by 2015
Hydromorphology Status:	Not designated artificial or heavily modified
Modified Waters Designation:	Not designated artificial or heavily modified
Higher Sensitivity Habitats:	None
Lower Sensitivity Habitats:	None
Phytoplankton Status:	Not classified
History of Harmful Algae:	Not classified
WFD Protected Areas within 2km:	None
Reasons for Not Achieving Good Status:	<ul style="list-style-type: none"> • Sewage Discharge • Poor Nutrient Management • Misconnections • Poor Livestock Management

Table 3-5: Summary of North Beck Catchment (tributary of Trent) Water Body Information

Parameter	Detail
Water Body Name:	North Beck Catchment (tributary of Trent) Water Body
Water Body ID:	GB104028058311
River Basin District Name:	Humber River Basin District
Water Body Type:	River
Waterbody Total Area (ha):	1,190
Ecological Status (2022):	Moderate
Chemical Status (2019):	Fail
Target Water Body Status and Deadline:	Good by 2027 – Low Confidence
Hydromorphology Status:	Not designated artificial or heavily modified
Modified Waters Designation:	Not designated artificial or heavily modified
Higher Sensitivity Habitats:	None
Lower Sensitivity Habitats:	None
Phytoplankton Status:	Not classified
History of Harmful Algae:	Not classified
WFD Protected Areas within 2km:	None
Reasons for Not Achieving Good Status:	<ul style="list-style-type: none"> • Sewage Discharge • Poor Nutrient Management • Poor Livestock Management

Eastern Unnamed Ordinary Watercourse

As set out previously, the unnamed ordinary watercourse in the east is shown to be within the catchment for the "Trent from Carlton on Trent to Laughton Drain Water Body" however, the watercourse is a tributary of the Sewer Drain to the north east. A summary of the baseline conditions for the "Sewer Drain Catchment Water Body" has therefore been provided in **Table 3-6** below.

Table 3-6: Summary of Sewer Drain Catchment (tributary of Trent) Water Body Information

Parameter	Detail
Water Body Name:	Sewer Drain Catchment (tributary of Trent) Water Body
Water Body ID:	GB104028058300
River Basin District Name:	Humber River Basin District
Water Body Type:	River
Waterbody Total Area (ha):	1,359
Ecological Status (2022):	Moderate
Chemical Status (2019):	Fail
Target Water Body Status and Deadline:	Moderate by 2015
Hydromorphology Status:	Heavily Modified
Modified Waters Designation:	Not classified
Higher Sensitivity Habitats:	None
Lower Sensitivity Habitats:	None
Phytoplankton Status:	Not classified
History of Harmful Algae:	Not classified
WFD Protected Areas within 2km:	None
Reasons for Not Achieving Good Status:	<ul style="list-style-type: none"> • Sewage Discharge • Poor Livestock Management • Poor Soil Management

3.2.2 Surface Water Protected Areas and Abstractions

Drinking Water Protected Areas (Surface Water) are defined as locations where raw water is abstracted from rivers, lakes, canals or reservoirs for human consumption. The Order Limits are partially located within the Drinking Water Protected Area (Surface Water) associated with the 'Trent from Carlton-on-Trent to Laughton Drain' waterbody. This Protected Area covers the majority of the eastern area of the Order Limits and portions of the western area. The Protected Area is classified as 'currently not at risk'.

Drinking Water Safeguard Zones (Surface Water) are defined as catchment areas that influence the water quality for their respective Drinking Water Protected Area (Surface Water), and are identified

where the Protected Area is classified as "at risk" of failing the WFD drinking water protection objectives. The Order Limits are not located within or nearby to any Drinking Water Safeguard Zone (Surface Water).

Through discussions with Anglian Water, it is understood that there is an Anglian Water abstraction point located just downstream of the Proposed Development ([at national grid reference SK 82020 73882 which](#) this is believed to be the "Hall River Trent Intake" but its official title is to be confirmed by Anglian Water).

4 Operational Embedded Measures

As part of the proposed works, there is a requirement for embedded mitigation measures to be included for the operational stages. These measures inherently ensure that there are no negative impacts to the existing watercourses and waterbodies within the Site, and are summarised below.

The **Outline Operational Environmental Management Plan [EN010159/APP/7.5.3]** and **Outline Battery Safety Management Plan [EN010159/APP/7.11.2]** have been prepared in support of the application, and measures relating to mitigation of operational activities are set out within this. An OEMP and BSMP will be produced to ensure that all operational activities relating to the watercourses are assessed in further detail, and appropriate mitigation is put in place. Those related to the watercourses and waterbodies are summarised below.

4.1 Embedded Mitigation Measures – Operational

4.1.1 Watercourse Offsets

As set out previously, the following offsets between watercourses and built development (panels, sub-stations, inverters and battery storage) have been embedded in to the design to provide access and ecological corridors.

- A minimum 10m buffer from all ordinary watercourse and field drains/ditches.
- A minimum 16m buffer from the River Trent (main river). It is worth noting that the buffers from the River Trent actually extend far beyond the 16m minimum.

These offsets are considered to mitigate against potential effects to the watercourses from an ecological and hydromorphological perspective, as the Proposed Development is set away from the watercourses.

4.1.2 Bridging of Watercourses

As set out previously, the need for bridging over ordinary watercourses to facilitate access has been kept to a minimum. Where these are required, a clear span structure will be preferential to minimise potential impacts to the watercourses. If any localised culverting is required, these will be sized accordingly.

Given the outline nature of the proposals, the location and form of bridging is yet to be confirmed. However, this would be confirmed at detailed design and further liaison will be held with the EA and Internal Drainage Board (IDB).

4.1.3 Drainage Strategy – SUDS

A Flood Risk Assessment⁷ (FRA), including surface water drainage strategy has been prepared to support the application. As part of this, an outline surface water drainage strategy has been prepared which sets out how rainfall landing on the Site will be managed. The strategy for the principle areas of development (i.e. solar panel areas and BESS and Sub-station Areas) is summarised below:

⁷ Logika, February 2025. Flood Risk Assessment and Outline Drainage Strategy. Document Reference: EN010159/APP/6.21

Solar Panels

In line with research undertaken by Wallingford HydroSolutions⁸, solar farms are not considered to result in significant increases in runoff when compared to the existing greenfield situation. This is on the basis that runoff from the panels themselves will simply drop directly to the ground where the natural regime will be maintained. In line with the advice set out by Wallingford HydroSolutions, it is proposed that the following measures will be implemented to ensure that any impacts of the solar panels are minimised:

- Disturbance to existing vegetation during construction will be minimised;
- Any disturbed vegetation will be re-established to maintain good ground cover across the Site;
- Regular inspection and maintenance will be undertaken to ensure that vegetation cover is adequate; and
- Fencing will be provided where required to avoid any disturbance to the vegetation by livestock or similar.

In addition to the above, it is proposed that strategic Sustainable Drainage Systems (SuDS) features such as filter drains, swales and basins/scrapes are incorporated within the solar array areas to encourage infiltration to the ground, and also provide ecological and biodiversity benefits. This approach has been agreed with the LLFA.

BESS and Sub-station Areas

The sub-stations and battery storage areas are considered to represent areas of hardstanding where surface water runoff would be generated rather than simply infiltrating to the ground (due to the inclusion of impermeable lining being incorporated to prevent potential contamination from infiltrating to ground). With this in mind, a more traditional drainage assessment has been prepared for these areas and the fundamental principles of the strategy are set out below:

- Surface water runoff from the hardstanding areas is to be restricted to greenfield rates (Qbar) for all events up to and including the 1 in 100 year plus 40% climate change event.
- Restricted runoff is to be achieved through the use of attenuation in the form of open green detention basins. It is proposed that runoff from the basins will discharge to the surrounding field drains/ordinary watercourses, mimicking the existing situation.
- SuDS in the form of permeable surfacing, swales, filter drains and detention basins are proposed which provide sufficient treatment of runoff prior to discharge to the surrounding watercourses. The level of treatment required and provided is quantified within the FRA, in line with CIRIA guidance.
- The potential for a fire to occur at the BESS and Sub-station locations has been considered, and a containment strategy has been set out within the detention basin, to prevent the potential for contaminated runoff discharging to the surrounding watercourses. This will include the provision of an automated penstock valve downstream of the attenuation, and any potentially contaminated water would be tankered away from the Site (and disposed of in line with best practice).

⁸ Wallingford HydroSolutions, December 2017. [Here comes the sun - WHS (hydrosolutions.co.uk), accessed September 2023]

- It is proposed that the drainage system and SuDS features servicing the BESS and Sub-station areas will be impermeably lined to prevent any potential contamination to groundwater should the fire suppression system be activated and contaminated fire water be within the system.

4.1.4 Ecological Works

With regards to the artificial otter holts, new ditch within the floodplain grazing marsh, and desilting and vegetation clearance of watercourses, these are not considered to require embedded mitigation from an operational and design perspective and construction is fundamentally where there are potential implications (should mitigation not be provided).

There will however, be a requirement to undertake maintenance works (such as vegetation clearance) associated with these features. These works would be undertaken in line with best practice and in line with a maintenance schedule which will be set out at detailed design.

These measures are considered to be positive measures with regards to ecological and watercourse status.

It is not proposed that harsh chemicals or pesticides will be utilised for vegetation management. The only situation in which herbicides may be used is to control and manage the spread of any non native or invasive plant species should these be found. Full details of vegetation management will be outlined within the Landscape and Ecology Management Plan (LEMP), post consent.

4.2 Operational Conclusion

It is concluded that the operational development will not cause or contribute to deterioration of the existing watercourses or groundwater bodies, or jeopardise their potential to achieve good status. This is based on the following:

- Offsets are to be provided between the built development and existing watercourses.
- Any bridging requirements are to be limited and clear span wherever feasible. Should culverting be required, these would be sized accordingly.
- Surface water runoff will be controlled to match natural rates (i.e. greenfield rates) prior to discharge to the existing watercourses, and sufficient treatment will be provided through the inclusion of SuDS features (including containment of contaminated fire runoff).
- Impermeable lining of the SuDS features will be provided to the BESS and Sub-station areas, to prevent any potential contamination to groundwater.

5 Construction Mitigation

Outline Construction Environmental Management Plan [EN010159/APP/7.4.3] has been prepared in support of the application, and measures relating to mitigation of construction activities are set out within this. A CEMP will be produced to ensure that all construction activities relating to the watercourses are assessed in further detail, and appropriate mitigation is put in place. This will be prepared in consultation with the EA. Those related to the watercourses and waterbodies are summarised below.

5.1 Construction Mitigation Measures

5.1.1 Staff Awareness and Training

The Contractor(s) will ensure that construction staff are fully aware of the potential impact to water resources associated with the construction works and procedures to be followed in the event of an accidental pollution event occurring. This would be included in the Site induction and training, with an emphasis on procedures and guidance to reduce the risk of water pollution.

5.1.2 Pollution Plans

Plans to deal with accidental pollution would be included within the CEMP(s) prior to commencement of construction. Any necessary equipment (e.g. spillage kits) would be held on-site and all Site personnel would be trained in their use.

5.1.3 Storage of Materials

The CEMP(s) will set out detailed storage proposals however, examples of such measures include:

- Placing arisings and temporary stockpiles outside of the Flood Zone 3 flood extent and away from drainage systems and watercourses.
- Placing all refuelling and storage areas for fuel, oil and chemicals at least 10 m away from the top of the bank of watercourses;
- All storage areas will be covered where possible to prevent the accumulation of rainwater. Where coverage is not adequate in heavy rainfall, containment measures such as bunds may include a valve to release accumulated rainwater;
- Containment measures will be implemented, including drip trays, bunding or double-skinned tanks of fuels and oils. These will have a minimum capacity of 110% of the capacity of the containers;
- Where these containment measures, such as bunds, are stored on impermeable surfaces, an oil separator (interceptor), or other device to remove oil from water, may need to be installed. This will be detailed in the CEMP if required;
- All chemicals would be stored in accordance with their Control of Substances Hazardous to Health (COSHH) guidelines, whilst spill kits will be provided in areas of fuel/oil/minor chemicals storage.
- An emergency spillage plan will be produced, which Site staff will have read and confirmed that they understand, via the Site induction.

- The mixing and handling of materials would be undertaken in designated areas and away from surface water drains.
- Plant and machinery will be kept away from surface waterbodies wherever possible and would have drip trays installed beneath oil tanks/engines/gearboxes and hydraulics, which would be checked and emptied regularly. Refuelling and delivery areas would be located away from surface water drains.
- Exposed ground and stockpiles would be protected as appropriate and practicable to prevent windblown migration of potential contaminants. Water suppression would be used if there is a risk of fugitive dust emissions.

5.1.4 Concrete

The exact locations and method of installation of concrete works within the site are not confirmed at this stage however, this will be detailed in the CEMP post-consent. Mitigation will likely include:

- Managing the timing of concrete works to account for weather conditions, where practicable concrete pours will be minimised during heavy precipitation events and carried out during dry periods.
- Regarding runoff control, the topography and layout of the site will be considered to direct works away from drainage channels, surface water features and sensitive areas.
- Containment measures for concrete washout, such as bunds and lined washout pits, will be designed in to the site, and measures will also implemented during the construction phase. These may include drain covers, ground protection (such as plastic sheeting), and wheel-washing facilities for vehicles travelling to and from site. Operatives will be briefed on the environmental risks and correct washout procedures.

5.1.5 Discharge/Disposal of Site Runoff

Where practical, earthworks will be undertaken during the drier months of the year. When undertaking earth moving works periods of very wet weather will be avoided, where practical, to minimise the risk of generating runoff contaminated with fine particulates. However, it is likely that some working during wet weather periods will be unavoidable, in which case other mitigation measures will be implemented to control fine sediment laden runoff. Water may also be required to dampen earthworks during dry weather to reduce dust impacts, and any runoff generated will need to be appropriately managed by the contractor(s) in accordance with the pollution prevention principles described in this chapter.

To protect watercourses from fine sediment runoff, topsoil/subsoil will be stored a minimum of 20m from watercourses on flat lying land. Where this is not practicable, and it is to be stockpiled for longer than a two-week period, the material will either be covered with geotextile mats, seeded to promote vegetation growth, or runoff prevented from draining to a watercourse without prior treatment.

Appropriately sized runoff storage areas for the settlement of excessive fine particulates in runoff will be provided.

Where needed, equipment and plant are to be washed out and cleaned in designated areas within the compound, where runoff can be isolated for treatment before disposal.

Mud deposits will be controlled at entry and exit points to the Site using wheel washing facilities and/or road sweepers operating during earthworks activities or as required.

Wash water will be prevented from passing untreated into watercourses. The exact measures to ensure this will be detailed in the CEMPO post-consent however, vehicle wash out and wheel washing facilities will be sited a minimum of 10 m from top of bank of watercourses, and mitigation measures are likely to include:

- A designated impermeable or lined area.
- Sediment management measures such as silt fencing).
- Provision of SuDS features where possible, which will be selected appropriately to provide sufficient treatment for suspended solids, metals and hydrocarbons.

If road transport is required to remove wash water to an offsite disposal facility then this will be assessed in the waste management procedures, which will be detailed in the CEMP.

If any suspected contaminated material is discovered during the works, the contractor would be required to investigate the areas and assess the need for containment or disposal of the material. If material is considered to be contaminated, it will be disposed of to an appropriately licensed facility.

Foundations and services will be designed and constructed to prevent the creation of pathways for the migration of contaminants, and would be constructed of materials that are suitable for the ground conditions and designed use.

5.1.6 Temporary Drainage

Measures that would be considered for implementation for temporary drainage through the construction design and/or CEMP(s) include:

- All reasonably practicable measures will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing watercourse, arising from construction activities. The measures will accord with the principles set out in industry guidelines. Measures may include use and maintenance of temporary lagoons, tanks, bunds and fabric silt fences or silt screens, as well as consideration of the type of plant used;
- A temporary drainage system will be developed to prevent runoff contaminated with fine particulates from entering surface water drains without treatment. This will include identifying all land drains and waterbodies in the Proposed Development area and ensuring that they are adequately protected using drain covers, sand bags, earth bunds, geotextile silt fences, straw bales, or proprietary treatment (e.g. lamella clarifiers);
- Connectivity will be maintained between the floodplain and the adjacent watercourses, with no increase in ground levels within the floodplain;
- Cut-off ditches or geotextile silt-fences, installed around excavations, exposed ground and stockpiles to prevent uncontrolled release of sediments; and
- Site access points would be regularly cleaned to prevent build-up of dust and mud; and all potentially contaminated waters (for example washdown areas, stockpiles and other areas of risk for water contamination) to have separate drainage. Any contaminated waters would be tankered away from the Site.

In addition, if monitoring demonstrates unsatisfactory levels of solids or other pollutants, measures would be implemented (e.g. changes to Site drainage and settlement facilities and/or use of flocculants), to control suspended solids or other contaminated discharge to watercourses.

5.1.7 Spillage Risk

Fuel will be stored and used in accordance with the Control of Substances Hazardous to Health Regulations 2002, and the Control of Pollution (Oil Storage) (England) Regulations 2001. Particular care will be taken with the delivery and use of concrete and cement as it is highly corrosive and alkaline.

Fuel and other potentially polluting chemicals will either be in self-bunded leak proof containers or stored in a secure impermeable and bunded area (minimum capacity of 110% of the capacity of the containers).

Any plant, machinery or vehicles will be regularly inspected and maintained to ensure they are in good working order and clean for use in a sensitive environment. This maintenance is to take place off Site if possible, or only at designated areas within the Site compound. Only construction equipment and vehicles free of all oil/fuel leaks will be permitted on Site. Drip trays will be placed below static mechanical plant.

Refuelling, oiling, and greasing will take place above drip trays or on an impermeable surface which provides protection to underground strata and watercourses, and away from drains as far as reasonably practicable. Vehicles will not be left unattended during refuelling.

As far as reasonably practicable, only biodegradable hydraulic oils will be used in equipment working in or over watercourses.

All fixed plant used on the Site will be self-bunded.

The Surface Water Drainage Strategy Plans will include details for pollution prevention and will be prepared and included alongside the CEMP(s). Spill kits and oil absorbent material will be carried by mobile plant and located at high-risk locations across the Order Limits and regularly topped up. All construction workers will receive spill response training and tool box talks.

All washing down of vehicles and equipment will take place in designated areas and wash water will be prevented from passing untreated into watercourses.

Suitable facilities for concrete wash water (e.g. geotextile wrapped sealed skip, container or earth bunded area) will be adequately contained, prevented from entering any drain, and removed from the Site for appropriate disposal at a suitably licensed waste facility.

Water quality monitoring of potentially impacted watercourse will be undertaken to ensure that pollution events can be detected against baseline conditions and dealt with effectively. Details of the water quality monitoring regime (including monitoring intervals) will be set out within the CEMP post consent, but will likely include monitoring upstream and downstream of any proposed surface water outfalls and water crossings as a minimum.

5.1.8 Watercourse Cable Crossings

A pre-works hydromorphology survey will be carried out for each watercourse to ensure the correct depth for passing under the watercourse.

A hydrogeological risk assessment will be produced prior to detailed design which will include a site-specific hydraulic fracture risk assessment. This will be produced as part of the CEMP prior to commencing works to define the mitigation required based on ground conditions.

A tidal riverbed survey will be required prior to the works under the River Trent.

The launch and receiving pits will be a minimum of 1.6m from the top of bank.

~~The launch and receiving pits will be a minimum of 10m from the watercourse edge.~~

The cable route crossing of the River Trent will be a minimum of 5m below the bed of the river. For other smaller watercourses, the crossing will be a minimum of 2.5m below the bed of the watercourse.

There is a small risk of drilling fluid break out from drilling to the watercourse if not appropriately mitigated for Site specific conditions. ~~A Site specific hydraulic fracture risk assessment will be produced as part of the CEMP prior to commencing works to define the mitigation required based on ground conditions.~~ Also included in this CEMP will be a bentonite fluid breakout plan and an emergency spillage response procedure.

5.2 Construction Mitigation Conclusion

With the above measures implemented, it is concluded that the construction will not cause or contribute to deterioration of the existing watercourses or groundwater bodies or jeopardise their potential to achieve good status.

As set out, the **Outline Construction Environmental Management Plan [EN010159/APP/7.4.3]** will be updated at detailed design and a CEMP will be produced to ensure that all construction activities relating to the watercourses are assessed in further detail, and appropriate mitigation is put in place. This will be prepared in consultation with the EA.

Furthermore, the CEMP will be supported by a Water Management Plan (WMP), that will provide greater detail regarding the mitigation to be implemented to protect the water environment from adverse effects during construction.

The WMP will include details of pre, during and post-construction water quality monitoring, details of this monitoring regime (including monitoring intervals) will likely include monitoring upstream and downstream of any proposed surface water outfalls and water crossings as a minimum. The WMP will include details for pollution prevention and response in the event of an incident. It is expected that variable depths to groundwater may be present across the Order Limits, hence construction works will be phased to limit the impacts to groundwater flows.

6 Decommissioning Mitigation

An **Outline Decommissioning Environmental Management Plan [EN010159/APP/7.6.3]** has been prepared in support of the application, and measures relating to mitigation of decommissioning activities are set out within this. A DEMP will be produced to ensure that all decommissioning activities relating to the watercourses are assessed in further detail, and appropriate mitigation is put in place. Those related to the watercourses and waterbodies are summarised below.

6.1 Decommissioning Mitigation Measures

From a watercourses and waterbodies perspective, the mitigation measures required for the decommissioning stage will follow the principles of those identified for the construction stage. A summary of which is provided below:

- Staff Awareness and Training – Training to be provided to ensure that construction staff are aware of the potential impact to water resources and procedures to be followed in the event of an accidental pollution event.
- Pollution Plans – Will be provided to detail how accidental pollution events should be dealt with.
- Storage of Materials – Detailed storage proposals will be set out with in the DEMP, however examples include those listed in Section 5.1.3.
- Concrete – Mitigation will likely include managing the timing of concreting to account for weather conditions, any potential runoff will be directed away from surface water features and sensitive areas, and containment measures for concrete washout will be embedded.
- Discharge / Disposal of Site Runoff – Where practical, earthworks will be undertaken during the drier months of the year to minimise the risk of generating runoff contaminated with fine particulates. Where work is required during wet weather, measures (in line with those set out in Section 5.1.5) will be implemented to control fine sediment laden runoff.
- Temporary Drainage – Temporary drainage will be provided to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing watercourse during decommissioning. The principle of the drainage strategy will follow that set out in Section 5.1.6.
- Spillage Risk – Fuel and other potentially polluting chemicals will be stored in accordance with the relevant regulations and will either be in self-bunded leak proof containers or stored in a secure impermeable and bunded area. Further spillage risk mitigation measures are outlined in Section 5.1.7.

6.2 Decommissioning Mitigation Conclusion

With the above measures implemented, it is concluded that the decommissioning will not cause or contribute to deterioration of the existing watercourses or groundwater bodies or jeopardise their potential to achieve good status.

As per the oCEMP, the **Outline Decommissioning Environmental Management Plan [EN010159/APP/7.6.3]** will be updated at detailed design and a DEMP will be produced to ensure that all decommissioning activities relating to the watercourses are assessed in further detail, and appropriate mitigation is put in place.

67 Conclusions

As part of the development proposals, any works to the existing watercourses are to be limited to surface water drainage outfalls, watercourse bridging for access, cable crossings and ecological habitat provision.

Embedded measures have been designed in to the Proposed Development to ensure that impacts to watercourses and waterbodies are mitigated against.

Construction mitigation measures have been set out within the **Outline Construction Environmental Management Plan [EN010159/APP/7.4]** and will be further considered within the CEMP at detailed design. The measures relating to watercourses and waterbodies are to ensure that potential impacts to these receptors are mitigated against.

Taking into account the embedded measures and construction mitigation, it is concluded that neither the operational, ~~or~~ construction or decommissioning stages of the development will cause or contribute to deterioration of the existing watercourses or groundwater bodies or jeopardise their potential to achieve good status.

Based on the above, it is proposed that no further consideration of WFD matters are required and all activities can be screened out.

78 Appendices

A1 Topographic Survey

A2 Development Proposals

A3 Environment Agency Meeting Minutes



London • Bristol • Warrington • Brussels