Stonestreet Green Solar

Environmental Statement
Volume 2: Main Text
Chapter 10: Water Environment

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Table of Contents

List of Tables

ES Volume 3, Figures (Doc Ref. 5.3)

ES Volume 4, Appendices (Doc Ref. 5.4)

Appendix 10.1: Water Environment Legislation, Planning Policy and Guidance

Appendix 10.2: Flood Risk Assessment ('FRA')

Appendix 10.3: Water Framework Directive Assessment

Appendix 10.4: Aldington Flood Storage Area Risk Assessment

Appendix 10.5: Schedule of Watercourse Crossings

10 Water Environment

10.1 Introduction

10.1.1 This Chapter of the ES was prepared by SLR Consulting Limited and presents an assessment of the likely significant effects on the water environment arising from the construction, operation and decommissioning of the Project. Mitigation measures are identified, where appropriate, to avoid, reduce or offset any significant adverse effects identified and/or enhance likely beneficial effects. The nature and significance of the likely residual effects are reported.

10.1.2 Descriptions of the Site, the Project and the different phases of development are provided in **ES Volume 2, Chapter 2: Site and Context (Doc Ref. 5.2)** and **Chapter 3: Project Description (Doc Ref. 5.2)**. A glossary of terms and list of abbreviations used in this Chapter is provided in the **Glossary (Doc Ref. 1.6)**.

10.1.3 The Chapter is supported by the following Figures:

ES Volume 3 – Figures (Doc Ref. 5.3)

- Figure 10.1: Water Environment Study Area;
- Figure 10.2: Local Topography;
- Figure 10.3: Local Hydrology;
- Figure 10.4: Flood Map for Planning;
- Figure 10.5: Superficial Geology;
- Figure 10.6: Bedrock Geology;
- Figure 10.7: Aquifer Characteristics; and
- Figure 10.8: Delineation of Flood Zones 3a and 3b.

10.1.4 The Chapter is supported by the following appendices:

ES Volume 4 – Appendices (Doc Ref. 5.4)

- Appendix 10.1: Water Environment Legislation, Planning Policy and Guidance;
- Appendix 10.2: Flood Risk Assessment ('FRA');
- Appendix 10.3: Water Framework Directive Assessment ('WFD Assessment');
- Appendix 10.4: Aldington Flood Storage Area Risk Assessment ('AFSA Risk Assessment'); and
- Appendix 10.5: Schedule of Watercourse Crossings.

10.1.5 This assessment has also been informed by the following figures which are provided in **ES Volume 3: Figures (Doc Ref. 5.3)** and **Book 2: Plans**:

- **ES Volume 3, Figure 1.1: Site Location Plan (Doc Ref. 5.3)**;
- **ES Volume 3, Figure 3.3: Illustrative Watercourse Crossing Locations (Doc Ref. 5.3)**; and
- **Illustrative Landscape Drawings (Doc Ref. 2.7)**.

10.1.6 This Chapter is also informed by the following documents which are provided in **Book 7: Other Management Plans and Reports**:

- **Outline Construction Environmental Management Plan ('Outline CEMP') (Doc Ref. 7.8)**;
- **Outline Construction Traffic Management Plan ('Outline CTMP') (Doc Ref. 7.9)**;
- **Outline Operational Management Plan ('Outline OMP') (Doc Ref. 7.11)**;
- **Outline Decommissioning Environmental Management Plan ('Outline DEMP') (Doc Ref. 7.12)**;
- **Outline Decommissioning Traffic Management Plan ('Outline DTMP') (Doc Ref. 7.13)**;
- **Outline Operational Surface Water Drainage Strategy ('Outline OSWDS') (Doc Ref. 7.14)**; and
- **Outline Battery Safety Management Plan ('Outline BSMP') (Doc Ref. 7.16)**.

10.2 Legislation, Planning Policy and Guidance

10.2.1 This Section provides an overview of the legislative and planning policy framework against which the Project will be considered for the water environment together with relevant guidance. Further details are provided in **ES Volume 4, Appendix 10.1: Water Environment Legislation, Planning Policy and Guidance (Doc Ref. 5.4)**.

Legislation

10.2.2 The following legislation relating to the water environment is relevant to the Project:

- The Water Framework Directive (2000/60/EC)[1];
- Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[2];
- The Groundwater Daughter Directive (2006/118/EC) [3];
- Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations 2015[4];
- The Priority Substances Directive (2008/105/EC)[5];
- Floods and Water (Amendment etc.) (EU Exit) Regulations 2019[6];
- Floods Directive (2007/60/EC)[7];
- Revised Bathing Water Directive ('RBWD') (2006/7/EC)[8],

- Environmental Permitting (England and Wales) Regulations 2016[9];
- Flood and Water Management Act 2010[10];
- Environment Act 2021[11];
- Reservoir Act 1975[12];
- Salmon and Freshwater Fisheries Act 1975[13],
- Environment Protection Act 1990[14],
- Land Drainage Act 1991[15], and
- Water Resources Act 1991[16], Water Act 2003[17] and the Water Act 2014[18]; and
- Floods and Water (Amendment etc.) (EU Exit) Regulations 2019[19].

10.2.3 Some of the above legislation derives from EU legislation which has now been transposed into English and Welsh law through various acts and regulations.

Planning Policy

National

10.2.4 The Project will be determined pursuant to section 104 of the PA 2008. On 17 January 2024, the Overarching National Policy Statement for Energy EN-1 ('NPS EN-1')[20], the National Policy Statement for Renewable Energy Infrastructure EN-3 ('NPS EN-3')[21] and the National Policy Statement for Electricity Networks Infrastructure EN-5 ('NPS EN-5')[22] came into force. These NPSs have effect in relation to the DCO Application.

10.2.5 **ES Volume 4, Appendix 10.1: Water Environment Legislation, Planning Policy and Guidance (Doc Ref. 5.4)** provides a summary of national planning policy of relevance to the Project and the water environment.

Local

10.2.6 While the primary basis for making decisions on applications for development consent is the relevant NPSs, other matters which the SoS may consider to be important and relevant in decision making may include the development plan policies of the 'Host' local authorities.

10.2.7 The Local Planning Authority is Ashford Borough Council ('ABC'). The county council is KCC. Development Plan Documents relevant to the Project include:

- ABC Local Plan 2030[23], including policies:
  - Policy ENV6 – Flood Risk.
  - Policy ENV8 – Water Quality, Supply and Treatment.
  - Policy ENV9 – Sustainable Drainage.
- Ashford Sustainable Drainage Supplementary Planning Document 2010[24];
- Kent Minerals and Waste Local Plan (2016)[25];

- Kent Minerals and Waste Early Partial Review (2020)[26]; and
- KCC's Drainage and Planning Policy Statement[27].

Guidance

10.2.8 The following guidance is relevant to the Project:

- National Planning Practice Guidance ('PPG') Flood Risk and Coastal Change[28];
- Guide for Masterplanning Sustainable Drainage into Developments, Lead Local Flood Authorities of the South East of England (2013)[29];
- Construction Industry Research and Information Association ('CIRIA') C753 The SuDS Manual (2015)[30];
- CIRIA C532 Control of water pollution from construction sites: Guidance for consultants and contractors (2001)[31];
- CIRIA C649 Control of water pollution from linear construction sites (2006)[32];
- Regulatory Position Statement ('RPS') 235: Treating and using water that contains concrete and silt at construction sites, Environment Agency ('EA') (2020)[33],
- RPS 261: Temporary dewatering from excavations to surface water, EA (2023)[34];
- Standard Rules ('SR') 2015 No 28: Installing a clear span bridge, EA (2019)[35];
- SR2015 No 29: Temporary storage on a flood plain of a main river, EA (2019)[36];
- SR2015 No 35: Excavating a wetland or pond in a main river floodplain, EA (2019)[37]; and
- Design Manual for Roads and Bridge ('DMRB') LA 113 Road drainage and the water environment (2020)[38].

10.3 Stakeholder Engagement

10.3.1 This Section of the Chapter summarises key stakeholder engagement undertaken to inform the water environment assessment. It also summarises the key matters raised by consultees in relation to the water environment assessment and explains how the ES has had regard to those comments or how they have been addressed in the ES.

EIA Scoping

10.3.2 **Table 10.1** provides a summary of the EIA Scoping Opinion (**ES Volume 4, Appendix 1.1: EIA Scoping Opinion (Doc Ref. 5.4)**) responses of relevance to the assessment of the water environment and how the issues raised have been responded to.

Table 10.1: EIA Scoping Opinion Response Summary

Consultee and Comment	Response
PINS (30 May 22)	
Water Framework Directive ('WFD') Assessment Scoping Report paragraph 11.8.1 proposes to scope out a WFD assessment on the basis that adverse effects from the Proposed Development would be avoided through implementation of appropriate mitigation measures secured via the CEMP, including a standoff of 10m between infrastructure and water bodies, pollution prevention measures, sediment management measures etc. Therefore, the Proposed Development is not likely to interfere with a water body's objectives or the ability to maintain/achieve good status. Scoping Report paragraphs 11.3.2 and 11.5.2 state that there is potential for watercourse crossings but these are not described in the project description and it is unknown whether potential crossings are for vehicles, cable routing etc. Without details of what crossings are proposed or potential associated impacts on WFD water bodies, the Inspectorate cannot agree to scope this matter out. The ES should provide a WFD assessment and this should be used to inform the ES assessment.	A WFD Assessment has been prepared as **ES Volume 4, Appendix 10.3: WFD Assessment (Doc Ref. 5.4)**. This provides details on the potential impact of the Project on WFD water bodies and relevant correspondence with the EA is provided as Annex C of the same Appendix. Further information on the WFD is provided in **ES Volume 4, Appendix 10.1: Water Environment Legislation, Planning Policy and Guidance (Doc Ref. 5.4)**. **ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4)** describes and locates all watercourse crossings proposed by the Project. **Section 10.7** 'Assessment of Effects' of this Chapter considers the potential water pathway and associated effects on the East Stour River. Effects on the East Stour River as a Habitat of Principal Importance ('HPI') are considered in **ES Volume 4, Appendix 9.7: Assessment of Effects (Doc Ref. 5.4)**.
Baseline water quality surveys: Desk-based surveys are proposed to inform the water environment baseline along with a walkover survey. Water quality surveys are not proposed to inform the baseline environment, but their omission is not justified. The Inspectorate is content with this approach provided that the ES demonstrates there would be no pathways of effect for water quality (noting the proposed mitigation for works near watercourse in scoping report paragraph 10.7.9).	Information on water quality to inform the assessment of effects has been informed by data published by the EA under the WFD as set out in **Section 10.5** 'Baseline Conditions' of this Chapter. No water quality surveys have been undertaken. Given an absence of complex upstream pollution sources, and mitigation measures secured through the **Outline CEMP (Doc Ref. 7.8)**, this approach is appropriate since there would be no pathways of effect. On this basis the inclusion of baseline water quality monitoring to inform the ES was scoped out.

Consultee and Comment	Response
	Water quality surveys would be undertaken prior to commencement are proposed to verify the baseline chemistry as secured by the **Outline CEMP (Doc Ref. 7.8)**.
Field Drains: The Project has potential to interrupt any drainage/irrigation systems that may be present below ground and any field drains present. ES should include consideration of impacts on the existing field drain networks and assess significant effects where they are likely to occur.	The PEIR considered field underdrainage as a receptor. While important as a potential flow pathway, or (if broken) a cause of flooding, such artificial, engineered installation are not important hydrological features and as such are not considered in this assessment. If field underdrainage is encountered, measures to avoid damage or disruption to the underdrainage system will be implemented, by micro-siting excavations. Where this is not practicable, field underdrainage would, in consultation with the landowner, be diverted or replaced, secured through the **Outline CEMP (Doc Ref. 7.8)**. As such, significant effects on field drains are not predicted.
Flood Risk Sources: Pluvial and fluvial flood risk sources are identified in Scoping Report paragraph 11.4.10 as potential impacts to the Project. Other sources of flooding are not identified, such as from groundwater, coastal or breach events (from flood defences or controlled waters such as reservoirs). Their omission is not justified. Impacts to and from flooding are not included in the summary of effects and impacts in **Table 11.1**. The ES should assess impacts and changes to flood patterns as a result of the Project and the vulnerability of the Project from flood risk from all sources of flooding including groundwater, coastal, and breach events from either defences or controlled waters such as reservoirs.	**Section 10.5** 'Baseline Conditions' and **Section 10.7** 'Assessment of Effects' of this Chapter and **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** assess impacts and changes to flood patterns as a result of the Project and the vulnerability of the Project from all sources of flooding in line with national planning policy. Breach events related to the Aldington Flood Storage Area ('AFSA') embankment are not considered in detail. This approach was discussed and agreed with the EA during pre-application consultation. The AFSA is managed under the Reservoir Act 1975 which regulates the safety of large, raised reservoirs to ensure they are safe. The risk of a failure is therefore considered to be negligible and mitigation beyond that required for fluvial flood risk impacts is not considered to be necessary. This information is also detailed in **ES Volume 4, Appendix 10.2: FRA, Section 8 (Doc Ref. 5.4)**.

Consultee and Comment	Response
Climate Change Projections: Collation of information on climate change is proposed for the baseline desk study but no further detail is provided on how this will be considered in the ES assessment, specifically on what projections will be applied and why. For the avoidance of doubt, the ES and associated Flood Risk Assessment (FRA) should use the latest climate change projections available and explain how they have been applied. Effort should be made to agree the approach with the relevant consultation bodies.	**Section 10.5** 'Baseline Conditions' of this Chapter provides information on climate change which has been applied in the assessment. Further details are provided in **ES Volume 4**, **Appendix 10.2**: **FRA (Doc Ref. 5.4)** and the **Outline OSWDS (Doc Ref. 7.14)** which have been developed using the most recent appropriate climate change allowances as published and updated by the EA in May 2022. The **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** approach was discussed with the EA prior to submission of the DCO Application in meetings on 10 May 2023 and 2 August 2023. A draft Hydraulic Modelling Report was also provided to the EA for review prior to submission (see **Table 10.2** of this Chapter for further details).
Groundwater levels, flow and infiltration: Scoping Report paragraph 4.4.2 proposes both piling and cable laying during construction. This has potential, both alone and cumulatively to affect surface water, groundwater levels, flow and infiltration, however, impacts to groundwater levels, flow and infiltration are not considered in potential impacts set out in Scoping Report. Impacts on groundwater flow and infiltration rates should be assessed in the ES where significant effects are likely to occur.	Given that a large proportion of the Site is underlain by clay bedrock, infiltration is not achievable, and groundwater is unlikely to be present. Groundwater impacts are therefore only possible in areas where permeable geology is present (i.e., Alluvium, Hythe Formation). However, the assessment determines that the Project would not give rise to effects on groundwater levels, flow or infiltration. Refer to **Section 10.7** 'Assessment of Effects' of this Chapter for further details.
Proposed Water Crossing: Scoping Report paragraph 4.3.11 identifies that Horizontal Directional Drilling (HDD) may be required to cross the East Stour River. A proposed water crossing is mentioned in Scoping Report paragraphs 11.3.2,11.5.1 and 11.7.1 but no further details are provided. The ES should describe the number, locations and types of watercourse crossings required for the Project and assess impacts where significant effects are likely to occur. Effort should be made	**ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4)** describes the number, locations and types of watercourse crossings required for the Project. These are also shown on **ES Volume 3, Figure 3.3: Illustrative Watercourse Crossings Locations (Doc Ref. 5.3)**. **ES Volume 4, Appendix 10.3: WFD Assessment (Doc Ref. 5.3)** includes an assessment of the specific activities associated with watercourse crossings.

Consultee and Comment	Response
to agree the approach and appropriate location(s) with the relevant consultees and should drilling fluid be used in construction, a breakout plan should be produced, submitted and secured in the application.	This includes an HDD risk assessment that considers potential effects relating to the use of drilling fluid, the potential for breakout and the process for confirming full details post planning following intrusive investigation. The **Outline CEMP (Doc Ref. 7.8** notes that where relevant, an HDD risk assessment will be provided as part of the detailed CEMP(s) and the EPP will include actions required in the event of a breakout of HDD fluids. Indicative locations of watercourse crossings were included as Figure 5.3 of the PEIR Addendum and further details of crossings were provided to both the Lead Local Flood Authority ('LLFA') and the EA prior to submission of the DCO Application. **Section 10.7** 'Assessment of Effects' of this Chapter considers the effects of watercourse crossings. No significant effects are identified.
Wye and Crundale Special Area of Conservation ('SAC') and Dungeness SAC: Evidence has not been provided to demonstrate that these designated sites are not hydrologically connected to the project site. Provided the ES demonstrates that the Project will not lead to hydrological changes to these sites, the Inspectorate is content to scope out impacts to these sites.	The Wye and Crundale Downs SAC and Dungeness SAC have been scoped out due to the lack of hydrological connectivity as confirmed at **Paragraph 10.6.59** of this Chapter.
Dungeness, Romney Marsh and Rye Bay Ramsar and Special Protection Area (SPA): Impacts from hydrological connection to the site have not been considered. Subject to demonstrating that the Project Site is not hydrologically linked to these sites and on the basis that appropriate further surveys validate the land is not functionally linked to these sites are submitted with the ES, the Inspectorate is content to scope out consideration of impacts to these sites.	The Dungeness, Romney Marsh and Rye Ramsar and SPA has been scoped into the assessment as confirmed at **Paragraph 10.6.59** of this Chapter.

Consultee and Comment	Response
Effort should be made to agree the approach with the relevant consultation bodies.	The approach for assessing impact to designated ecological sites was set out in a draft of the **Information to Inform a Habitats Regulations Assessment (Doc Ref. 7.19).** This was provided to Natural England ('NE') prior to submission of the DCO Application.
KCC (18 May 2022)	
KCC would refer the applicant to the County Council's Drainage and Planning Policy Statement, which sets out how KCC, as LLFA, will review drainage strategies and surface water management provisions associated with applications for major development.	An **Outline OSWDS (Doc Ref. 7.14)** has been developed in line with KCC's Drainage and Planning Policy Statement[29].
The proposal is in an area which is identified as 'Water Stressed' and that the impact on the total water cycle needs to be assessed environmentally. KCC recommend that Water Resources are included to provide a full assessment of the water environment.	The Project will not require a significant supply of potable water during the operational phase with potable water only required to serve the Project Substation welfare facilities (wash basin and cess tank). Nor will the Project require water for landscape irrigation over the full 40-year operational phase, with new planting as part of the landscape proposals likely to only require watering in exceptional drier periods over the first few years following planting to ensure establishment (assumed as three years based on the **Outline LEMP (Doc Ref. 7.10)**). A full lifecycle assessment is not considered to be warranted and has therefore not been undertaken. As discussed in **Paragraph 10.4.5 – 10.4.11** of this Chapter the impact of the Project on main water supplies is not considered to be significant and therefore scoped out of the assessment. **Section 10.7** 'Assessment of Effects' of this Chapter considers more generally the effect of the Project on water resources. Due to the clayey nature of the geology and shallow soils on the Site, and local topography, infiltration to ground is constrained. Measures set out in the

Consultee and Comment	Response
	Outline OSWDS (Doc Ref. 7.14) will hold back and attenuate flow promoting discharge to ground. This is considered to be an improvement to the existing regime by encouraging groundwater recharge where appropriate.
The Council notes that the Scoping Report indicates that a site-specific Flood Risk Assessment ('FRA') will be prepared and appended to the Water Environment chapter of the Environmental Statement. KCC also notes paragraph 1.6.2 which states that *'Mitigation measures (e.g. incorporation of Sustainable Drainage Systems ('SuDS'), with applicable climate change allowances in the design of the Project) will be designed to avoid, reduce or offset potential adverse effects and these will inform the Project's design, including its layout.'*	Refer to **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** and the **Outline OSWDS (Doc Ref. 7.14)**.
Recommends that during construction and decommissioning phases, any works or disturbance causing flooding or damage to the Public Right of Way surfaces must be avoided.	Drainage will be provided during the construction and decommissioning phases as secured by the **Outline CEMP (Doc Ref. 7.8)** and **Outline DEMP (Doc Ref. 7.12)**. These management plans include measures to ensure that runoff generated during construction or decommissioning is managed appropriately and also that damage to PRoW surfaces is avoided and does not result in localised flood issues to PRoWs or any land on or outside of the Site.
EA (26 May 2022)	
Flood Risk: We are mostly satisfied with the scoping report in terms of flood risk and the flood risk assessment. We would however highlight the following: 11.7.1 Likely Significant Effects: This section should include an assessment of the proposal's impact on the Aldington Flood Storage Area. It is important that the development does not in any way	**Sections 10.7** 'Assessment of Effects' provides an assessment of the impacts of the Project on the AFSA. This is supported by **ES Volume 4, Appendix 10.4: AFSA Risk Assessment (Doc Ref. 5.4)** which provides information to evidence that construction, operation and decommissioning of the Project will not compromise the function or efficacy of the AFSA.

Consultee and Comment	Response
compromise the function or efficacy of the FSA. The scope of the proposed EIA is acceptable in principle in that it outlines key issues of concern at this Site.	
Risks associated with horizontal drilling (including information on all drilling fluids) should also be assessed as part of the ES (likely in the Water Environment chapter).	**ES Volume 4, Appendix 10.3: WFD Assessment (Doc Ref. 5.4)** considers the potential risks associated with HDD on WFD water bodies. **Section 10.7** 'Assessment of Effects' of this Chapter also considers potential flow pathways and associated effects.
Southern Water (24 May 2022)	
Appropriate protective provisions will be required to ensure the protection of Southern Water's assets and ensure that necessary provisions are in place to ensure that the apparatus can be maintained in perpetuity. Without such provisions the proposed application will have an unacceptable impact on Southern Water's assets. It is possible that a sewer now deemed to be public could be crossing the Site. Therefore, should any sewer be found during construction works, an investigation of the sewer will be required to ascertain its ownership before any further works commence on site.	The Applicant and Southern Water have begun discussions regarding appropriate Protective Provisions.
River Stour (Kent) Internal Drainage Board ('IDB') (19 May 2022)	
IDB provided information on what they would expect to see for surface water runoff discharge and works affecting watercourses.	These information requirements are provided in the **Outline OSWDS (Doc Ref. 7.14)**.
Aldington and Bonnington Parish Council (undated)	
Field 22 is flooded annually in winter. It is unsuitable for solar PV and should be identified as such. The lower end of Fields 10 (labelled 106 on the plan?) and 21 are also affected during heavy rain episodes. 11.6.1 states 'no built development in hydrologically sensitive areas.' The lower	Flood risk to the Project is considered in **Section 10.7** 'Assessment of Effects' of this Chapter. Embedded Mitigation with regards to flood risk is detailed in **Section 10.6** 'Embedded Design Mitigation' of this Chapter. **ES Volume 4, Appendix 10.2:**

Consultee and Comment	Response
end of Callywell Lane suffers excessive surface water during extreme weather events. Drainage on clay soils can be a problem and large array of solar PV may aggravate local flooding issues and even cause them where they have not previously existed. The topography of the Site may also result in water cascades that channel rainwater in ways that a ploughed or planted field does not. With storm events increasingly frequent in the Southeast water management is essential. SUDS drainage is often unsuitable as it is easily overwhelmed by sudden and heavy rainfall due to the slow absorption of clay soils. Rainwater frequently runs off fields onto the local roads during summer months due to the nature of the soil. A vast array of solid glass panels will provide particular challenges to storm water management, being as the rain will at best be channelled in larger amounts onto a reduced ground footprint (most of it being under the panel). The water sensitive receptors assessed in The Water Environment Statement should include all surrounding lanes and gardens.	**FRA (Doc Ref. 5.4)** presents an assessment of flood risk of the Project. A hydraulic model of the East Stour River through the Site has been developed to inform the FRA which identifies land parcels considered to be at risk of flooding as well as associated flood levels / depths. Modelling of the prevailing flood risk has informed the Project design. As such, no development is proposed in areas whereby flood depths are at or would exceed 0.8m. The **Outline OSWDS (Doc Ref. 7.14)** includes measures to ensure that post-development runoff rates will not exceed the existing greenfield runoff rates entering the East Stour River, and thus have negligible impact on flood risk. It considers the implications of local geological characteristic and provides drainage for the PV Arrays to prevent rapid channelisation during extreme rainfall. SuDS drainage is considered suitable for the Site; however, it is acknowledged that due to ground condition such features are unlikely to facilitate infiltration. Instead, appropriate features are sized to control and restrict surface runoff rates with storage provided to accommodate excess flows for all events up to and including the design 1% Annual Event Probability ('AEP') storm plus an appropriate allowance for climate change. Lanes and gardens are not assessed as sensitive receptors as the risk to these features will either not change or be lessened (i.e., improve) as a result of the Project.
Natural England ('NE') (18 May 2022)	
Stodmarsh SSSI, SAC, SPA and Ramsar Site: Providing there are to be no discharges to water courses within the Stour Catchment which may result in an increase in nutrients reaching the designated sites, NE considers that an	**Paragraph 10.5.8** of this Chapter describes that whilst the Site is within the catchment of Stodmarsh designated site there will be no residential accommodation and the Project will remove land from intensive arable use over a 40-year period.

Consultee and Comment	Response
impact is unlikely. Should discharges to water course be proposed, then NE would recommend that the potential impacts to the Stodmarsh designated sites should be considered within the ES. Water Quality: The assessment should take account of the risks of water pollution and how these can be managed or reduced. A number of water dependent protected nature conservation sites have been identified as failing condition due to elevated nutrient levels and nutrient neutrality is consequently required to enable development to proceed without causing further damage to these sites. The ES needs to take account of any strategic solutions for nutrient neutrality or Diffuse Water Pollution Plans, which may be being developed or implemented to mitigate and address the impacts of elevated nutrient levels.'	There will therefore likely be a net reduction in nutrient loading. In their response to the 2023 Statutory Consultation (see **Table 10.3** of this Chapter), NE also confirmed that *'Commercial development, not including overnight accommodation, will not normally require a nutrient assessment'*. **Section 10.7** 'Assessment of Effects' of this Chapter includes a water quality assessment which considers the risks of water pollution and how these will be managed/reduced.

Non-Statutory Consultation

10.3.3 **Table 10.2** of this Chapter provides a summary of non-statutory consultation (i.e., meetings with statutory bodies or ABC officers) that was undertaken of relevance to this assessment and how the assessment has responded to them.

Table 10.2: Non-Statutory Response Summary

Consultee and Comment	Response
EA Meeting (10 May 2023)	
▪ Consultant to confirm panel heights with EA. ▪ Consultant to confirm flood depths behind Aldington FSA based on the modelling data and confirm whether the development will impact on this. ▪ EA raised that any works within the FSA will need consultation from the supervising engineer and the Project must ensure nothing impacts operation, maintenance and flow control structures. ▪ EA raised that fencing in the fluvial	A technical note (SLR Ref: 425.064837.00001) dated 26 July 2023 was subsequently submitted to the EA to address the issues raised in the meeting. Landscape and drainage works are proposed within the AFSA. These works are designed to avoid the need to raise ground levels, seek opportunities to lower ground levels remote from the embankment (increase flood storage and no structural implications) and avoid the creation of woody debris which could be mobilised by flood water when the AFSA impounds. Further information on works

Consultee and Comment	Response
floodplain must demonstrate that flood flows are not affected. ▪ Consultant to demonstrate the Project has no impact on the extent of flooding upstream of the FSA.	within the AFSA are provided in **ES Volume 4, Appendix 10.4: AFSA Risk Assessment (Doc Ref 5.4)**. Information on the impacts of the Project on flooding upstream of the AFSA is provided in **Section 10.7** 'Assessment of Effects' of this Chapter and **ES Volume 4, Appendix 10.2: FRA, Section 9.8 (Doc Ref. 5.4)** and **Outline OSWDS (Doc Ref. 7.14)**. Consideration of the potential for elements of the Project downstream of the AFSA to obstruct flow, either directly or by introducing structures on which mobilised debris can accumulate are set out in **Section 10.6** 'Embedded Design Mitigation' of this Chapter secured through the **Design Principles (Doc Ref. 7.5)**. These include: ▪ All PV panels raised by a minimum of 0.8m above ground level on firmly secured mounting structures so that water can freely pass beneath without damage to the structure. ▪ All PV panels will be south facing with a 2m to 5m wide gap between each row of PV panels. ▪ Security fencing within Fields 19, 23 and 24 (i.e. in floodplain downstream of the AFSA) will have a minimum clearance of 0.2m between the bottom of the security fence and the ground and minimum mesh spacing of 0.1m to minimise the potential to create a barrier to flood flows. South facing PV panels mean that rows will run roughly along the primary direction of the flood flow / debris.
▪ Consultant to provide relevant flood information (water crossings, watercourse standoffs and HDD) for the asset team to review and arrange for follow up meeting to discuss any	Discussions have been held with the EA in regard to relevant flood information (water crossings, watercourse standoffs and HDD). Refer to response below dated

Consultee and Comment	Response
concerns. ▪ EA confirmed all standoffs from watercourses will be 8m.	2 August 2023 (**Table 10.2** of this Chapter). **ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4)** provides the locations of watercourse crossings and HDD. The **Design Principles (Doc Ref 7.5)** secure a minimum 10m buffer (as measured from the top of the bank or channel edge under normal flows) from the East Stour River and IDB managed watercourses. No new physical infrastructure other than essential works (such as cable crossings, watercourse crossings, drainage and Public Rights of Way ('PRoW') footbridges) will be developed within this buffer.
EA Meeting (2 August 2023)	
Meeting to discuss SLR Consulting Technical Note. EA to provide draft hydrology from the modelling they have commissioned for comparison with SLR modelling work. EA confirmed temporary bridges to be 600mm above the bank elevation. EA confirmed that temporary bridges over and HDD drilling beneath the River East Stour will be subject to Flood Risk Activity Permits ('FRAP'). SLR flood modelling may need to be reviewed and approved by the Evidence & Risk team; a charged EA service. SLR to consider flood storage compensation requirement for any proposed structures or changes to ground levels, including solar panel frames, possible concrete block stands, etc. If service crossing below the bed of a main river not involving an open cut technique, applicant would need to check all conditions can be met, if not Bespoke FRAP may be required.	The EA provided data to be inputted into the SLR flood modelling exercise which has been used to inform the Project design and **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)**. **ES Volume 4, Appendix 10.2: FRA, Section 11.3 (Doc Ref. 5.4)** demonstrates there would be no loss in flood compensation storage as a result of the Project. The Project will deliver a small increase in flood compensation storage in the Northern Area. EA comments on bridge soffit levels, model review process and FRAP consents are noted.

Consultee and Comment	Response
Bespoke FRAP required for temporary watercourse crossings over Main River.	
EA Meeting (8 February 2024)	
It was confirmed by the EA that provided that no disapplication of water environment legislation is proposed as part of the DCO, the EA will not require any protective provisions.	Water environment legislation that is considered applicable to the Project is detailed in **ES Volume 4, Appendix 10.1: Water Environment Legislation, Planning Policy and Guidance (Doc Ref. 5.4)**. The **Draft Development Consent Order (Doc Ref. 3.1)** is not seeking to disapply any legislation relating to the water environment. As such all proposed works, on both existing and proposed watercourse crossings and also any other works within statutory offsets from main rivers and flood defences, will be subject to separate approval from the relevant statutory drainage authority. In addition, any requirement during construction for discharge of water from excavation will also only be undertaken subject to necessary permits. The **Schedule of Other Consents and Licences (Doc Ref. 3.4)** provides information on the other consents and licences outside of the DCO and includes: ▪ FRAPs; ▪ IDB Land Drainage Consents; and ▪ Water Discharge Activity Permits.
The applicant must inform the EA of the constituent components of all drilling fluids prior to their use, so it can be determined whether a groundwater activity permit is required for their use. There must be no discharge to groundwater of any hazardous materials, or any non-hazardous pollutants such that they cause pollution of groundwater. Certain activities may be exempt from permitting, but such cases are made on a case-by-case assessment by the local	Discussions with the EA relating to the HDD will be undertaken as part of the FRAP process and the preparation of the detailed CEMP(s) which will be developed in line with the **Outline CEMP (Doc Ref. 7.8)**. The **Outline CEMP (Doc Ref. 7.8)** also sets out appropriate measures for the storage, handling and management of chemicals in line with best practice. Plans to deal with accidental pollution would also be included in the detailed CEMP(s) prior to commencement of construction.

Consultee and Comment	Response
Groundwater and Contaminated Land team. All chemicals etc. should be stored in accordance with best practice guidance so as to avoid accidental spills etc.	Application of any exemption from permitting would only be undertaken following discussion and agreements with the EA.
Legal approval is required [for works] on land the EA has a leasehold or freehold interest. In other area FSA that the EA have an interest (floodable) – EA also to be consulted, but no formal permitting requirements. In both cases these should be addressed through discussions with the Estates Team.	The Applicant has consulted with the EA Estates team and these discussions will be progressed as the DCO progresses through Examination.
Concern raised about potential backwater effect arising from the development at toe of the spillway as this could increase the risk of erosion during a spill.	The Hydraulic Modelling Report (included as **Annex B of ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)**) models such effects through change in roughness. The assessment concludes that potential backwater effects at fences and hedges becoming blocked with debris are minimal (<0.02m) and very localised. These features will have no discernible impact at the toe of the AFSA embankment.
EA email correspondence (12 September 2023)	
The EA confirmed in this email that they were content for the scope of the WFD assessment limited to the proposed HDD and temporary crossings of the watercourse.	This scope is reflected in **ES Volume 4, Appendix 10.3: WFD Assessment (Doc Ref. 5.4)** and relevant correspondence with the EA is provided as **Annex C** of the same Appendix.
EA email correspondence (23 April 2024)	
A response was provided by the EA to draft SLR hydrology and hydraulic modelling reports which stated: *'We have applied a risk based approach to the assessment of this model. In this instance a basic review has been carried out (a review of the hydrology and hydraulic model reports, but not the model files). We don't have any specific comments on the reports and consider that the model appears to provide a suitable basis for assessing the flood risk.*	The hydrology and hydraulic modelling reports referenced were provided in draft to the EA for comment in January 2024 and are provided as **Annex B: East Stour Hydraulic Modelling Report** of **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)**. The outputs from this modelling have been used as the basis for assessing flood risk in **ES Volume 4, Appendix**

Consultee and Comment	Response
The proposed substation building is to be located outside the Aldington FSA and above the FSA embankment crest level designed to contain the 1in10,000 year flood event. The solar panels in the fields downstream of the FSA will be on legs above the design flood levels with appropriate freeboard to be assessed by the designer. *From the information so far provided we are unlikely to raise an objection to a formal application on flood risk grounds.'*	**10.2: FRA (Doc Ref. 5.4)**) and this Chapter.
River Stour IDB – Meeting (7 February 2024)	
The cumulative impact of setting discharges from inverter groups at 1l/s might be considered significant. It was accepted that this might be required for maintenance purposes, but some kind of contribution may be necessary. Schedules of charges from IDB are currently being updated and due in April. We will forward a copy of the revised schedule when adopted.	The **Outline OSWDS (Doc Ref. 7.14)** considers the cumulative impact of discharges from Inverter Stations and commits to restrict discharge from these areas to a rate of 0.4l/s (i.e. the greenfield rate) with enhanced monitoring and maintenance to manage the risk of blockage to the outfall. Details of the proposed drainage arrangements are set out in the **Outline OSWDS (Doc Ref. 7.14)**.
It is not universally agreed PV panels do not result in an uplift in runoff rates and volumes – the inclusion of depression storage down gradient of solar panels was welcomed in relation to this. Provided there is an assessment of adequate, if limited, infiltration. There must be capacity to accommodate successive storms (within reason), and the depressions should not just fill up and remain full.	Detailed testing at the location of each area of proposed depression storage will be undertaken to inform detailed design. If testing confirms water will not infiltrate, a permeable outflow face will be constructed into the downgradient face of the depression to allow storm flow to gradually seep onto the down gradient land. Testing is secured through the **Outline OSWDS (Doc Ref. 7.14)**.
Proof concerning low infiltration rates should be provided as part of application.	A ground investigation has been undertaken on the Site and outputs from this are provided in **ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref. 5.4)**. This confirmed the low permeability of the ground conditions and/or presence shallow groundwater. Further testing will be undertaken to inform detailed design (as secured

Consultee and Comment	Response
	through the **Outline OSWDS (Doc Ref 7.14)**).
It was queried whether 3.2m easement was sufficient for riparian drains. It was noted that there would be a further set back from the security fence of 3.2m to the PV panels for maintenance so there is a buffer of 6.4m minimum from the riparian drains. On that basis the IDB accepted that the 3.2m easement was appropriate.	The 3.2m buffer for drains and channels is specified in the **Design Principles (Doc Ref. 7.5)**.
The IDB confirmed that they will not be seeking any Protected Provisions on the understanding that Land Drainage Consent will be sought for any aspect of the proposal that requires it.	The **Draft Development Consent Order (Doc Ref. 3.1)** is not seeking to disapply any legislation relating to the water environment. As such all proposed works, on both existing and proposed watercourse crossings, will be subject to separate approval from the relevant statutory drainage authority.
Kent County Council (15 December 2022)	
The County Council recommends that the OSWP considers not only how surface water from the ancillary structures will be dealt with, but how rainfall upon the solar arrays themselves will be managed. The possible concentration of water flow off the arrays can create flows that can erode the soil and allow a greater volume of overland flow to enter watercourses or flow to adjacent areas at a greater rate than would otherwise occur in greenfield conditions. It is essential that runoff is not increased to safeguard neighbouring areas of land. To minimise any potential risk of overland flows, the County Council as Lead Local Flood Authority requests that additional measures of runoff protection are examined. Some of these measures may include: ▪ Incorporating bunds, filter drains or other measures to interrupt flows of water between rows of solar arrays to disperse water flows over the surface and promote infiltration into the soils.	The **Outline OSWDS (Doc Ref. 7.14)** sets out principles and an outline design for managing storm water on the Site in line with best practice and the requirements of KCC, the LLFA for the area. Areas around the PV Arrays will be planted with species rich grassland. This will increase interception and evapotranspiration, reducing rapid channelisation of flows along the drip line. The proposed surface water drainage strategy is set out in the **Outline OSWDS (Doc Ref. 7.14)**. The **Illustrative Landscape Drawings (Doc Ref. 2.6)** and **Outline LEMP (Doc Ref. 7.10)** set out the indicative landscape proposals and its management. To minimise potential residual risks of overland flows from PV Arrays, swales and depressions are proposed around the Site and downgradient of the PV Arrays. These are designed to intercept flows of

Consultee and Comment	Response
▪ Incorporating wide grassed filter strips at the downstream side of blocks of solar arrays and maintaining the grass at a long length to interrupt water flows and promote infiltration. ▪ Incorporating gravel filled filter drains or swales at the downstream side of blocks of solar arrays to help infiltrate run-off (where ground conditions allow). ▪ Vegetated strips through a combination of wildflowers and or grass along with buffer strips around the perimeter of the fields buffer strips will be left uncut to capture any runoff leaving the site. Whilst such measures detailed above will reduce impacts, it is essential that the vegetated buffer strips and planting around the panels are maintained throughout the lifetime of its operation. Future removal/ lack of maintenance may result in increased runoff/ erosion. As a result, a suitable maintenance regime is required to ensure erosion and runoff are controlled.	water and promote infiltration to ground. These measures will prevent any increase of surface water runoff from the Site and are secured through the **Outline OSWDS (Doc Ref. 7.14)**. The **Outline OSWDS (Doc Ref. 7.14)** has been developed in accordance with the requirements set out by KCC and incorporates measures to minimise overland flows including filter drains, swales, new ditches and attenuation storage for the proposed impermeable areas associated with the Project infrastructure.

2022 Statutory Consultation

10.3.4 **Table 10.3** of this Chapter provides a summary of the responses to the PEIR of relevance to this assessment and how the assessment has responded to them.

Table 10.3: 2022 Statutory Consultation Response Summary

Consultee and Comment	Response
EA	
The FRA should take account of guidance within the National Planning Policy Framework (NPPF), including the latest updates to the associated planning practice guidance. The FRA should undertake an assessment of risk ensuring an appropriate allowance for climate change allowance is used: Flood risk	**ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** includes: ▪ Consideration of NPPF and up-to-date National PPG; and ▪ Best available flood and water environment information, including latest climate change allowances.

Consultee and Comment	Response
assessments: climate change allowances – GOV.UK (www.gov.uk)	
We would reiterate that the red line boundary includes land that is part of the Aldington Flood Storage Area. It is essential that the development does not in any way compromise the function or efficacy of this flood risk management structure or our ability to undertake maintenance or improvements. Without additional details and an assessment of risk we are unable to confirm if any development within the FSA would be acceptable.	The AFSA has been accounted for within the Project and factored into the design. The Site boundary is in close proximity to and includes parts of the AFSA. A risk assessment has been prepared for the AFSA in **ES Volume 4, Appendix 10.4: AFSA Risk Assessment (Doc Ref. 5.4)** and concludes that the Project does not compromise the function or efficacy of ASFA nor the EA's ability to undertake maintenance or improvements.
Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place: ▪ on or within 8 metres of a main river (16 metres if tidal); ▪ on or within 8 metres of a flood defence structure or culverted main river (16 metres if tidal) [….]; ▪ involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert; or ▪ in a floodplain more than 8 metres from the river bank, culvert or flood defence structure (16 metres if it's a tidal main river) and you don't already have planning permission.	The **Design Principles (Doc Ref. 7.5)** ensure there would be no new physical infrastructure other than essential works (such as cable crossings, watercourse crossings, drainage and PRoW footbridges) within 10m of the main river (East Stour River) which runs through the Site. A buffer area for the AFSA embankment has been provided by the EA which includes all areas within 8m of the toe of the embankment and additional land to the north. As shown on **ES Volume 4, Appendix 10.4: AFSA Risk Assessment (Annex A)**, within this buffer area there will be no new physical infrastructure other than: • an approximately 40m section of the internal haulage road during the construction and decommissioning phases; and • the Primary Access Track and Cable Route into the Project Substation. These features will however not be located on the flood defence asset and on natural high ground. Further details of setbacks from watercourses and the works within the permitting distances stated by the EA are

Consultee and Comment	Response
	provided within the **ES Volume 4, Appendix 10.3: WFD Assessment (Doc Ref. 5.4)**. Indicative watercourse crossings are included as **ES Volume 3, Figure 3.3: Illustrative Watercourse Crossing Locations (Doc Ref. 5.3)** which includes temporary bridge crossings and HDD locations. Further details of the crossing locations, likely works and permit requirements are provided in **ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4)**. FRAPs will be sought as appropriate under the Environmental Permitting (England and Wales) Regulations 2016. This will include for any excavation works or proposed structures (e.g. fencing) within 8m of main rivers and works within the buffer area around the AFSA embankment.
The ES & FRA should describe the number, locations and types of watercourse crossings required for the development – the applicant should not assume permits will automatically be forthcoming if planning permission is granted and we therefore advise that they consult with us at the earliest opportunity.	Discussions which included the location, nature and design for crossings were held with the EA on 10 May 2023 and 2 August 2023 (see **Table 10.2**) and the outcome of these discussions fed into the final scheme. **ES Volume 3, Figure 3.3: Illustrative Watercourse Crossing Locations (Doc Ref. 5.3)** shows the indicative location of watercourse crossings. Further details of the crossing locations, likely works and permit requirements are provided in **ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4)**. Permits and consents required are described in the **Schedule of Other Consents and Licences (Doc Ref. 3.4)**.
Given the proposal mostly involves installation of floor- mounted solar panels, the impact to the groundwater is likely to be low, although installation of underground cables (especially if oil-filled)	Measures for the protection of ground and surface water, pollution prevention, measures relevant to the use of HDD and emergency response are provided in the **Outline CEMP (Doc Ref. 7.8)**. Measures in the **Outline DEMP (Doc Ref. 7.12)** are

Consultee and Comment	Response
present a risk, as does the storage or any oils/chemicals. Horizontal Directional Drilling presents a risk to groundwater in certain areas. Piling, although not likely to be significant, may also have an impact on the groundwater. Mitigation measures are proposed to be mainly addressed through good practice via a CEMP, which is yet to be produced in detail. Based on the proposed plans, identified potential risks and receptors, and proposed mitigation measures, we agree in principle with the PEIR and have no objection at this stage from the perspective of groundwater quality protection.	also relevant to the decommissioning stage of the Project.
River Stour IDB	
Surface water drainage routes, flow rates and discharge volumes from the development should replicate greenfield conditions. Infiltration should be used as the primary means of managing surface water. Land drainage consents will be required for any works within 8m of watercourses in the River Stour Drainage District.	The proposed sustainable surface water drainage strategy is set out in the **Outline OSWDS (Doc Ref. 7.14)**. Surface water runoff from the Site will be restricted to greenfield rates to not adversely impact pluvial and fluvial flood risk. Surface water drainage features will be sized to attenuate for the additional runoff generated during the 1 in 100-year (plus 45% climate change) storm event. The proposed drainage strategy will prioritise infiltration, with all applicable drainage features unlined to promote infiltration. Where infiltration is not practicable due to geology and ground conditions, explanation is provided in the **Outline OSWDS (Doc Ref. 7.14)**. Land drainage consents will be obtained as required prior to construction from the relevant statutory body.
Aldington and Bonnington Parish Council	
Parts of the Project are in flood zone 3 which would have potential for increased	Since the 2023 Statutory Consultation, PV panels previously proposed in Fields 26-29 have been removed in response to

Consultee and Comment	Response
water runoff and increase risk of flooding. Areas in flood zone 3 should be removed.	detailed flood modelling. Inverter Stations downstream of the AFSA have also been moved to land designated as Flood Zone 1. Elements of the Project that remain in Flood Zone 3 are as follows: ▪ PV panels - limited to locations whereby the design flood level (1% AEP plus 55% climate change fluvial event) is below 0.8m; ▪ Sellindge Substation - The design flood level (1% AEP plus 55% climate change fluvial event) in this area is shallow and not sufficient to damage electric equipment which will be appropriately raised; ▪ Below ground electrical cables which will extend through areas of Flood Zone 3a and 3b. Once in place these will not be impacted by flooding and will not have any effect of flood risk; ▪ Security fencing – raised by 0.2m off the ground and with mesh sized >0.1m to minimise risk of conveyance impacts; and ▪ Access tracks – 90% permeable and constructed at grade to avoid impacts on runoff and conveyance. No other infrastructure is proposed in areas designated as Food Zone 3a or Flood Zone 3b. In line with Annex 3 of the NPPF[28] the solar farm is classed as 'essential infrastructure'. The elements of the scheme in Flood Zone 3 are all considered to meet the requirements of the Exception Test and are deemed acceptable. **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** confirms which aspects of the Project extend into areas of Flood Zone 3 and concludes that the Project will not be subject to undue levels of risk and will not lead to off-site flood risk.

Consultee and Comment	Response
SUDS drainage would not retain ground water sufficiently due to the sloping nature of a large part of the site and the nature of the clay soil.	The **Outline OSWDS (Doc Ref. 7.14)** has been developed taking into account the Site topography, geology and soil geological conditions.
Community Feedback (2022)	
Increased vehicle movements during the construction and operational phases may cause compaction in areas of ground underlain by heavy clay, potentially leading to increase surface water flooding.	Measures to avoid ground compaction during construction and decommissioning are included the **Outline CEMP (Doc Ref. 7.8)** and **Outline DEMP (Doc Ref. 7.12)**, including the use of ground protection mats, low-pressure tyres on wheeled vehicles and breaking up areas of compacted ground. Internal access tracks will be used primarily during the operational phase. Other access during this period would be infrequent and the nature of vehicles requiring access is such that such effects are unlikely.
The sloping solar panel surfaces will reduce the area of open ground which rain can fall on. Runoff from the lower edge of the panels will fall onto a reduced area of open ground, increasing the overall rate of runoff during storm events.	On sloped ground, runoff from the PV panels will flow to the open ground beneath the downslope panels, replicating the existing conditions. Vegetation will be present beneath the lower edge of the panels to reduce the impact of runoff falling from the panels. The **Illustrative Landscape Drawings (Doc Ref. 2.6)** and **Outline LEMP (Doc Ref. 7.10)** provide information on the proposed planting. Depression storage will intercept and attenuate flows from the PV Array ensuring there is no increase in surface water runoff.
Sustainable drainage systems (SUDS) drainage will not retain runoff sufficiently due to the sloping nature of a large part of the site and the nature of the clay soil.	SuDS features will be sized to provide sufficient attenuation for storm events up to and including the 1 in 100 year (+45% climate change) storm event and will be engineered to cut into the slope as required. Flows will be restricted to greenfield rates to avoid flood risk impacts. The proposed drainage strategy is provided in the **Outline OSWDS (Doc Ref. 7.14)**.

Consultee and Comment	Response
Less agricultural activity (ploughing, drilling etc) within watercourse catchments will reduce infiltration and increase surface water runoff.	Grassland within the on-Site watercourse catchments, and other habitats, will be managed through the **Outline LEMP (Doc Ref. 7.10)**. Grassland management will reduce the rate and volume of runoff during the operational phase compared to the existing situation as the vegetation cover will lead to more interception of precipitation.
The PEIR report does not sufficiently assess the risk of surface water flooding, including the effect of the topography and underlying soil.	The risk of surface water flooding has been further evaluated within **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** which includes modelling of runoff from the Site.
KCC (15 December 2022)	
The County Council, as Lead Local Flood Authority notes that an Outline Operational Surface Water Drainage Plan (OSWP) will be produced as part of the ES and that it is proposed that surface water runoff will be discharged by infiltration, where feasible to do so. Alternatively, surface water runoff will be discharged at a restricted rate to the local watercourses. Any discharge off-site will be restricted to greenfield runoff rates. We agree that these principles are correct and suited to the site.	The proposed surface water runoff management are provided in the **Outline OSWDS (Doc Ref. 7.14)**. Any off-site discharge will be restricted to greenfield run-off rates.

2023 Statutory Consultation

10.3.5 **Table 10.4** of this Chapter provides a summary of the responses to the PIER Addendum of relevance to this assessment and how the assessment has responded to them.

Table 10.4: 2023 Statutory Consultation Response Summary

Consultee and Comment	Response
EA (20 July 2023)	
We have reviewed the PEIR and addendums and had one thing to challenge. Ch9 p15 states: Downstream of	Hydraulic modelling (included in **Annex B** of **ES Volume 4, Appendix 10.2 (Doc Ref. 5.4)**) defines the risk posed to the

Consultee and Comment	Response
the AFSA other Fields are situated within Flood Zone 3, as shown on the currently available EA modelling and Figure 3.7. However, as previously outlined, it is understood that the EA are updating the flood modelling of the East Stour River which will incorporate the AFSA within the modelling and this would potentially reduce the extent of Flood Zone 3 downstream of the AFSA. This statement is not correct as Flood Zone 3 is based on the Undefended 1% AEP.	Project and is considered an appropriate basis for design. This includes the effect of the AFSA and is therefore a defended scenario. This will not redefine Flood Zone 3. Updated EA modelling was not available at the time of writing (May 2024). However the principles of the hydraulic modelling included in **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** have been agreed through consultation with the EA.
We understand that flood risk will be covered in the Environmental Statement as well as a site specific flood risk assessment. This should take account of guidance within the NPPF, including the latest updates to the associated planning practice guidance The FRA should undertake an assessment of risk ensuring an appropriate allowance for climate change allowance is used: Flood risk assessments: climate change allowances – GOV.UK (www.gov.uk). We would reiterate that the red line boundary includes land that is part of the Aldington Flood Storage Area (FSA). It is essential that that the development does not in any way compromise the function or efficacy of this flood risk management structure or our ability to undertake maintenance or improvements. Without additional details and an assessment of risk we are unable to confirm if any development within the FSA would be acceptable; we are in talks with the developer on this matter, with the latest meeting held on 10 May 2023.	The FRA has been prepared in compliance with relevant NPS and NPPF and associated planning practice guidance which includes appropriate allowances for climate change in line with relevant EA guidance. The **FRA (ES Volume 4, Appendix 10.2 (Document 5.4))** demonstrates that the Project will be safe for its proposed operational lifetime in consideration of climate change. A risk assessment has been developed for the AFSA and is included as **ES Volume 4, Appendix 10.4: AFSA Risk Assessment (Doc Ref. 5.4)**. This evidences that the Project would not affect the function or efficacy of the AFSA.
The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place: ▪ on or within 8 metres of a main river	A minimum 10m buffer (as measured from the top of the bank or channel edge under normal flows) will be provided from the East Stour River and IDB managed watercourses.

Consultee and Comment	Response
(16 metres if tidal); ▪ on or within 8 metres of a flood defence structure or culverted main river (16 metres if tidal); ▪ on or within 16 metres of a sea defence; ▪ involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert; or ▪ in a floodplain more than 8 metres from the riverbank, culvert or flood defence structure (16 metres if it's a tidal main river) and you don't already have planning permission. The Environmental Statement and Flood Risk Assessment should describe the number, locations and types of watercourse crossings required for the development – the applicant should not assume permits will automatically be forthcoming if planning permission is granted and we therefore advise that they consult with us at the earliest opportunity. There also appears to be some uncertainty about works in, on, over or under the East Stour, a main river in the EA's jurisdiction, and its tributaries, some of which might also be in the Stour (Kent) Internal Drainage Board (Map of our Drainage District – River Stour Internal Drainage Board) district. This must also be clarified. Where works are planned that will affect the East Stour, the EA will require the applicant to apply for a Flood Risk Activity Permit which will also require current (less than three years old) species surveys. In addition, if appropriate, the requirements of Biodiversity Net Gain on the river may also need to be met by the applicant.	A buffer area for the AFSA embankment has been provided by the EA which includes all areas within 8m of the toe of the embankment and additional land to the north. As shown on **ES Volume 4, Appendix 10.4: AFSA Risk Assessment (Annex A)**, within this buffer area there will be no new physical infrastructure other than • an approximately 40m section of the internal haulage road during the construction and decommissioning phases; and • the Primary Access Track and Cable Route into the Project Substation. These features will however not be located on the flood defence asset and on natural high ground. Cable crossings, watercourse crossings, drainage, the section of the temporary internal haulage road, and the track and cable into the Project Substation will all be subject to FRAPs from the EA. Watercourse crossing locations, likely works and permit requirements are provided in **ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4)**. This document confirms permitting responsibilities for each structure based on the nature of the water body and the boundary of the IDB area. Discussions which included the location, nature and design for crossings were held with the EA on 10 May 2023 and 2 August 2023 (see **Table 10.2**) and the outcome from these discussions fed into the final scheme. Information on other consents and licences outside of the DCO is provided in the **Schedule of Other Consents and Licences (Doc Ref. 3.4)**. **ES Volume 4, Appendix 10.3: WFD Assessment (Doc Ref. 5.4)** demonstrates that watercourse crossings will not affect

Consultee and Comment	Response
	the geomorphology, ecology or water quality of the watercourse. Consideration of biodiversity net gain requirements within the Project are discussed in the **Biodiversity Net Gain Assessment (Doc Ref. 7.1).**
The addendum details do not change our original comments (which remain valid) from a groundwater quality perspective. We note a land contamination assessment has been undertaken. Additional recommendations for CEMPs are proposed, which we agree with.	Appropriate measures to protect groundwater are incorporated into the **Outline CEMP (Doc Ref. 7.8)**.
Kent County Council (20 July 2023)	
The Lead Local Flood Authority has no immediate concerns in response to the latest consultation material and is pleased to note that a Full Risk Assessment and Drainage Strategy is to be provided as part of the Environmental Statement. However, the County Council, as Lead Local Flood Authority, is disappointed to note that comments relating to the management of surface water and associated Flood Risk provided within the County Council's response to the previous Statutory Consultation, dated 15 December 2022, do not appear to have been considered as part of the latest submission. The County Council would have expected these to be considered within Volume 2 of the PEIR, Chapter 9 Water Environment, 9.3 – Key Consultation Issues and Responses. The Applicant should therefore engage with the Lead Local Flood Authority accordingly to respond to the points raised in the letter dated 15 December 2022.	The comments received from KCC (15 December 2022) are taken into account in this Chapter, supporting appendices and the **Outline OSWDS (Doc Ref. 7.14)**. The Applicant has undertaken specific consultation with the LLFA prior to submission of the DCO Application.
NE (17 July 2023)	

Consultee and Comment	Response
We stated in our advice on the original PEIR that provided there is no hydrological connectivity between the application site and the Gibbin's Brook SSSI we are satisfied that impacts are unlikely to result. The response to this in Table 8.2, Chapter 8, PEIR Addendum is as follows: The project hydrological consultant has confirmed that the watercourse that passes through Gibbin's Brook SSSI does ultimately connect to the East Stour River, but that the SSSI is located at such a distance (in terms of watercourse length) and an elevation (70mAOD; whereas ground levels are approximately 55mAOD at Harringe Lane, which is the easternmost point of the Site) that there will be no impact on the flows into the SSSI in terms of volume, rate or water quality. Furthermore, the hydrologist has confirmed that this SSSI is located north of the M20 and railway line, which presents hydrological barriers between the SSSI and the Site. The SSSI is also located on a different geological unit to the Site, so is unlikely to have a direct hydrogeological connection. This appears to be slightly contradictory in that there apparently is a connection between the water course passing through Gibbin's Brook SSSI and the East Stour River (within the Site) but various factors mean any hydrogeological connection is unlikely to be direct and significant impacts are unlikely to result. It would be helpful if the final ES could provide further clarity on this matter in defining the nature of the connection between the two watercourses and the justification for concluding significant impacts as unlikely.	Gibbin's Brook SSSI has been scoped out of the assessment due to it being located upstream of the Site and therefore not connected hydrologically to the Site or therefore the Project.
Both the original PEIR and the Addendum highlight that there is the potential for the development to result in an increase in nutrient discharges to the Stour Catchment and the impacts that this could have for the	The **Outline CEMP (Doc Ref. 7.8), Outline OMP (Doc Ref. 7.11** and **Outline DEMP (Doc Ref. 7.12)** include measures to ensure that foul flows generated by the Project from welfare facilities will be

Consultee and Comment	Response
Stodmarsh SSSI, SAC, SPA and Ramsar Site. This appears to relate primarily to the provision of welfare facilities (toilets), particularly during the construction and decommissioning phases when a significant number of workers will be present on the Site. The current proposed mitigation is to store foul water in a cess / septic tank and tanker it off site to a licensed treatment facility outside of the Stour catchment. While NE welcomes this precautionary approach we would query whether it is necessary. Mitigation for nutrient impacts on the Stodmarsh sites is normally only required for development including new, overnight accommodation. Commercial development, not including overnight accommodation, will not normally require a nutrient assessment as set out in Section 4 'Plans and Projects Affected' on page 5 of the covering letter issued by NE to all relevant parties when Nutrient Neutrality became a national approach in March 2022: https://www.ashford.gov.uk/media/0jabvost/ne-march-2022-letter-water-quality-and-nutrient-neutrality-advice.pdf	collected and tankered from the Site for treatment and disposal at a suitably licenced facility outwith the Stour catchment. This will ultimately ensure no adverse impacts to the Stodmarsh site with regard to nutrient loading. In line with the comments from NE it is noted that this is not strictly required to comply with nutrient neutrality requirements.
Aldington and Bonnington Parish Council (17 July 2023)	
The Parish Council considers that its concerns about the nature of rainfall behaviour on large areas of land that naturally drains into a known flood zone area are not addressed, to the point of being ignored.	Detailed hydraulic modelling has been undertaken to inform **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)**. The modelling includes surface water runoff on land at and immediately surrounding the Site and confirms no adverse effects are likely. The drainage strategy, set out in the **Outline OSWDS (Doc Ref. 7.14)**, has been developed to avoid adverse changes in runoff from the Site.
All fields in Flood Zone 3 and sloping sites that drain into those fields should be removed from the proposal. We await the hydraulics modelling and updated Flood	All PV panels and other water sensitive infrastructure have been removed from areas of the floodplain upstream of the AFSA. Inverter Stations downstream of the

Consultee and Comment	Response
Risk Assessments to permit the Parish Council to review the subsequent determination of flood extents, levels, depths, velocities, and overland flood routing not evidenced in the proposal.	AFSA are all now located on land designated as Flood Zone 1. **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)**) demonstrates that the operation of the PV panels downstream of the AFSA in the floodplain will not be impacted by flood water and that the Project will remain safe for its operational lifetime in consideration of climate change.
The proposal and consultation have failed to address specific concerns in relation to climate change, and the increasingly wetter winters experienced nationally as a result. Of key local interest is the flooding of country lanes which is now a regular occurrence. We consider that this is a significant material concern where solar panels are proposed on undulating land.	Hydraulic modelling provided in Annex B of **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** and the **Outline OSWDS (Doc Ref. 7.14)** specifically consider potential changes in the severity of fluvial flooding associated with climate change. The **Outline OSWDS (Doc Ref. 7.14)** secures that runoff from the Site will not exceed the pre-development rates. The Project is not predicted to lead to or worsen off-Site flooding, such as at country lanes.
Community Comments	
The solar panels would cause run off of water and increased flooding to low lying land.	PV panels will typically have little or no impact on storm water runoff. However, as set out in the **Outline OSWDS (Doc Ref. 7.14)** additional drainage (depression storage) will be provided downgradient of areas of where PV panels are proposed to intercept, slow and encourage infiltration of any surface runoff from these areas. This will ensure that runoff from the Site does not exceed the pre-development rate.
Energy storage units should not be located on land that is subject to flooding. They should also be accessible by emergency services.	All BESS Units (formerly referred to as 'energy storage units') are now located in areas that are at low risk of flooding. The Applicant has also included internal access tracks to ensure BESS Units can be accessed by emergency services. Further information about battery safety management and emergency access is provided in the **Outline BSMP (Doc Ref. 7.16)**.

10.3.6 No comments related to the water environment were received during the 2023 and 2024 Targeted Consultations.

10.4 Assessment Methodology

Assessment Scope

10.4.1 The general approach to EIA methodology is detailed in **ES Volume 2, Chapter 6: EIA Methodology (Doc Ref. 5.2)**.

10.4.2 There are no published guidelines or criteria for assessing and evaluating effects on water environment within the context of an EIA. The assessment has therefore been based on project specific methodology which is in line with standard industry practice. This is detailed further in **Table 10.5** and **Table 10.6** of this Chapter.

Matters scoped in

10.4.3 This Chapter includes an assessment of the potential effects of the Project during the construction, operational and decommissioning phases. The potential impacts to be considered include the following:

- Increased runoff on exposed ground causing erosion and pollution;
- Increase in silt and sediment loads as a result of construction and decommissioning works;
- Disturbance or erosion of bed and banks of watercourses and land drains;
- Increased runoff from hardstanding areas causing erosion and pollution;
- Increase in downstream flood risk from watercourse crossings;
- Changes to watercourse morphology and surface water flow and any associated changes in downstream flood risk;
- Point source pollution from accidental spillages; and
- Disruption/ cut off of natural surface and groundwater pathways.

10.4.4 The **EIA Scoping Report (ES Volume 4, Appendix 1.1 (Doc Ref. 5.4)**) proposed that a WFD assessment would be scoped out. However, in line with the Scoping Opinion (see **Table 10.1** of this Chapter) this has been undertaken and is included as **ES Volume 4, Appendix 10.3: WFD Assessment (Doc Ref. 5.4)**.

Matters scoped out

Potable water demand

10.4.5 Potable water for the study area is supplied by South East Water. The Site boundary is within South East Water's South Essex Water Resource Zone ('WRZ') 8 within their Water Resource Management Plan ('WRMP')[39].

10.4.6 During construction and decommissioning of the Project, worker peak on Site is expected to be approximately 199 workers over the 12-month programmes. During construction and decommissioning, potable water supply for workers will be provided via water tanker, bottled water, and water cooler type supply or similar.

Welfare facilities within the Primary Construction Compounds may be connected to the main supply located within Station Road following agreement with the service provider at the detailed design stage. Water required for construction activities is expected to be transported to Site, using intermediate bulk containers or similar.

10.4.7 Given the low numbers of workers expected on Site during the 12-month construction and decommissioning programmes, and the nature of the construction and decommissioning activities, water demand during the construction and decommissioning phases will not be significant.

10.4.8 The Project will require a supply of potable water during the operational phase only to serve the Project Substation welfare facilities (wash basin and cess tank) and maintenance operations. Given the low staffing levels, the water demand from this will be minimal and will be met from the existing mains water systems locally.

10.4.9 New planting as part of the landscape proposals is likely to only require watering in exceptional drier periods over the first three years following planting to ensure establishment. Water for landscape irrigation will be transported to Site using intermediate bulk containers or similar.

10.4.10 Water tanks required for fire safety will be filled from either the existing water network or transported to Site using intermediate bulk containers or similar. The filling of water tanks will occur upon commissioning of the Project, and intermittently over the 40-year operational phase when maintenance and testing of the water tanks is required or after a fire safety event that requires the water tanks to be refilled.

10.4.11 Given the above, the additional pressure placed on the local potable water supply network during the construction, operational and decommissioning phases of the Project will not be significant. The impact of the Project on potable supplies has therefore been scoped out of the assessment.

Study Area

10.4.12 The water environment study area is identified on **ES Volume 3, Figure 10.1 (Doc Ref. 5.3)**. The area assessed includes the entire Site area and a 2km buffer from the Site boundary. Water features beyond this distance are also considered where hydraulic connectivity to areas beyond the study area are possible.

Establishing Baseline Conditions

Desktop Research

10.4.13 The assessment of the baseline conditions has involved the following approach:

- Completion of a detailed desk study to establish current baseline geological, hydrogeological and hydrological conditions informed by relevant technical appendices with regards to flood risk; and
- Consultation with stakeholders for data and information with regard to the Site and any potentially sensitive environmental receptors.

10.4.14 The following tasks were undertaken to ensure that the baseline data provides sufficient information for the assessment of the Project's likely significant effects:

- Review of Ordnance Survey ('OS')[40] maps to identify surface water features and springs within and adjacent to the Site;
- Review of EA and Defra publicly available LiDAR Survey Data[41] to assess topographic setting;
- Identification of WFD classifications and objectives, obtained from the EA website[42] for watercourses and water bodies within, and adjacent to, the Site;
- Collation of data on EA licensed abstractions, private water supplies ('PrWS') (ABC) and EA discharge consents within, and adjacent, to the Site;
- Collation of information on climate (including long term average monthly rainfall figures) (MET Office)[43], surface hydrology (National River Flow Archive)[44] and EA flood risk mapping;
- Identification of hydrogeological conditions and groundwater resources (including groundwater vulnerability and productivity) (British Geological Survey[45], Magic Map[46]) together with secondary information relating to:
  - bedrock and superficial geology mapping;
  - soil mapping;
  - below ground utilities information on and adjacent to the Site as provided by Emapsite[47]; and included with **ES Volume 4, Appendix 11.2: Phase 1 Geoenvironmental and Geotechnical Desk Study (Doc Ref. 5.4)**, **ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref. 5.4)** and **ES Volume 4, Appendix 11.4: Conceptual Site Model (Doc Ref. 5.4)**.

10.4.15 A site walkover was undertaken on 24 and 25 July 2023 to survey surface water features on, and in proximity to, the Site. This walkover included visual inspection of the Site to validate the understanding of the hydrological conditions at the Site obtained from a desk-based study, and to establish an understanding of the AFSA and flood defence infrastructure located adjacent to the north-eastern part of the Site.

10.4.16 Further site visits to survey the location of existing and proposed watercourse crossing were undertaken on the 11 and 23 January 2024, and 7 February 2024. Photographs and finding from these visits are provided in **ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4).**

10.4.17 This assessment considers the potential changes in the baseline for the lifetime of the Project if no development was to occur (i.e. the future baseline). With regards to the water environment, the main changes from the current baseline scenario would relate to climate change. Assessment of future baseline conditions has involved the following approach:

- Analysis of EA climate change allowances in relation to peak fluvial flows

and peak rainfall over the anticipated lifetime of Project; and

- Implementation of these allowances into hydraulic models relevant to the Project.

Identifying Likely Significant Effects

10.4.18 The aims of the assessment are to:

- Establish the water environment baseline conditions;
- Identify water environment sensitive receptors;
- Identify potential likely impacts as a result of the Project and arrive at a conclusion about the likely effect of these;
- Define Embedded Mitigation (e.g. avoiding hydrological sensitive areas in the design of the Project) that would be implemented as part of the Project;
- Determine the scale of any potential effects, assuming Embedded Mitigation, by assessing the degree of sensitivity of the hydrological and hydrogeological receptors and the potential magnitude of change from the baseline condition;
- Establish if the scale of the effect is considered significant;
- Describe additional mitigation and monitoring; and
- Identify residual and cumulative effects.

10.4.19 Potential impacts are identified using a source-pathway-receptor approach. This means that for an impact on the water environment to occur, the following is required:

- An impact source (such as the release of polluting chemicals, physical modifications to channel morphology, disruption or alteration to hydrology and drainage patterns);
- A receptor that is sensitive to that impact (such as a water body and the services it supports); and
- A pathway by which the impact source and receptor are linked.

10.4.20 The first stage in applying this approach is identifying the potential sources of impact from the Project. These sources are identified through review of the Project, including the size and nature of development, construction methodologies and timescales / Project lifetimes.

10.4.21 The second stage in applying this approach is identifying all potential receptors which are relevant to the water environment based on a desk study and walkover survey. These typically include surface waters, groundwaters and local designated sites.

10.4.22 The final step in the approach is determining a pathway between the source and receptor which is undertaken in the context of the local water environment conditions, such as topography, geology, hydrology and the nature of the impact.

10.4.23 Once potential impacts have been identified, a risk assessment of the likely significant effects on the water environment has been undertaken. This is based on assessment criteria, established guidance and professional judgement and experience on other similar schemes. Where appropriate the assessment is supported by detailed technical analysis and modelling including detailed hydraulic modelling of fluvial flood risks which is discussed in detail in **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)**.

10.4.24 The qualitative risk assessment methodology has been used to assess the significance of the potential effects associated with the Project. Two factors have been considered using this approach: the sensitivity of the receiving environment and the potential magnitude of impact, should that potential impact occur.

10.4.25 This approach provides a mechanism for identifying the areas where site-specific mitigation measures are required and for considering the effectiveness of mitigation measures proposed to manage the risk presented by the Project. This approach also allows effort to be focused on reducing risk where the greatest benefit may result.

10.4.26 This methodological approach is applied for the construction, operational and decommissioning phases of the Project.

Construction Effects

10.4.27 Construction of the Project is expected to commence in 2026, with completion in 2027. This would represent an indicative build out period of 12 months.

Operational Effects

10.4.28 The proposed operational period for the Project is 40 years (assumed as 2027 through to 2067).

Decommissioning Effects

10.4.29 Decommissioning is expected to be undertaken over an indicative 12-month period commencing in 2067 and for the purposes of assessment has been assumed through to 2068.

10.4.30 These are therefore the durations over which potential effects are forecasted.

Cumulative Effects

10.4.31 Cumulative effects assessment takes into consideration the effects associated with the Project in combination with other relevant developments. Cumulative effects are in essence the complete set of effects arising from the Project coinciding with the effects from other developments within the Zone of Influence on the same receptor.

10.4.32 The study area for potential cumulative effects within the water environment study area uses a Zone of Influence ('ZoI') of 2km for catchments with a maximum downstream distance of 5km from the Site.

10.4.33 **ES Volume 4, Appendix 6.1: List of Cumulative Schemes (Doc Ref. 5.4)** provides the 'Focused Long List' of 'other existing development and/or approved development' to be taken forward to Stage 2 and considered within the cumulative assessment within the ES for the Project.

10.4.34 **Section 10.12** 'Cumulative Effects' of this Chapter sets out which cumulative schemes of **ES Volume 4, Appendix 6.1: List of Cumulative Schemes (Doc Ref. 5.4)** are considered for assessment and the reasons why.

10.4.35 The remaining cumulative schemes have been screened out as they are:

- in construction and will have been completed prior to construction of the Project commences;
- already constructed; or
- located in a separate surface water catchment to the Project.

10.4.36 These remaining schemes are therefore not considered further in this assessment.

Determining Effect Significance

10.4.37 Determining the significance of effects is a two-stage process that involves defining the sensitivity of the receptors and the magnitude of the potential impacts. This Section describes the criteria applied in this assessment. The terms used to define receptor sensitivity are aligned with those used in the Design Manual for Roads and Bridges ('DMRB') guidance LA113[48] (Table 3.69 therein).

Sensitivity of Receptor

10.4.38 The sensitivity of receptors to hydrological and hydrogeological impacts has been determined using **Table 10.5** of this Chapter, which documents a hierarchy of factors relating to the water environment. Note that professional judgement is applied when assigning a sensitivity category to all water features.

Table 10.5: Receptor Sensitivity Descriptors

Value (Sensitivity)	Descriptor	Example
Very High	Receptor has a high quality and rarity on a national or regional scale and limited potential for substitution. Receptor is highly vulnerable to impacts that may arise from the project and recoverability is long- term or not possible.	Groundwater Source Protection Zone ('SPZ') 1. Abstractions for public or private drinking water supply.

Value (Sensitivity)	Descriptor	Example
High	Receptor has a high quality and rarity on a local scale and limited potential for substitution. Receptor is generally vulnerable to impacts that may arise from the project and recoverability is slow and/or costly.	Principal Aquifer providing a regionally important resource or supporting a site protected under UK habitat legislation (i.e., Groundwater Dependent terrestrial ecosystems ['GWDTEs]' and Nationally and internationally designated sites where hydrology / hydrogeology is a key factor in its designation [e.g., Ramsar / SSSIs / SACs / SPAs]). Groundwater SPZ 2 or 3. Protected under UK habitat legislation (e.g., SSSI, SAC, Ramsar site). Designated Salmonid / Cyprinid Waters and/or fishery present. Surface water providing a regionally important resource or supporting a site protected under relevant UK habitat legislation (i.e., water dependent ecological receptors). Abstractions for non-potable use >20m^3/d (e.g., industry / process water, spray irrigation, river augmentation).
Medium	Receptor has a medium quality and rarity, local scale and limited potential. Receptor is somewhat vulnerable to impacts that may arise from the project and/or has moderate to high recoverability.	Secondary A Aquifer. Secondary B Aquifer providing water supply to private abstractions. Principal Aquifer providing a locally important resource or supporting river ecosystem. Groundwater in peat deposits. Classified as a main river with no further designations. Large lakes and non-potable reservoirs.

Value (Sensitivity)	Descriptor	Example
		Abstractions for non-potable use <20m^3/d (e.g. industry / process water, spray irrigation, river augmentation). Statutory designated sites where hydrology / hydrogeology is a key factor in designation (NNR, LNR).
Low	Receptor with a low quality and rarity, local scale and limited potential for substitution. Receptor is not generally vulnerable to impacts that may arise from the project and/or has high recoverability.	Secondary B Aquifer. Secondary Undifferentiated Aquifer. Aquifers supporting potentially water dependent ecosystems. Ordinary watercourse and no designated features. Non-sensitive water resources (non-EA / WFD classified i.e. small lakes, ponds). Man-made feature not in hydraulic continuity (i.e. canal). Abstractions for industrial use (e.g. dust suppression/ washing machinery). Non-statutory designated sites where hydrology / hydrogeology is a key factor in designation (e.g. LWS wetland).

Magnitude of Impact

10.4.39 **Table 10.6** of this Chapter describes the guideline criteria used to assess the magnitude of change. The magnitude of change upon each receptor was determined by considering the change experienced from the baseline conditions, subject to the consideration of embedded mitigation.

Table 10.6: Magnitude of Impact Descriptors

Impact Magnitude	Descriptor
High	Total loss of, or alteration to, the baseline resource such that post-development characteristics or quality would be fundamentally and irreversibly changed.
Medium	Loss of or alteration to the baseline resource such that post-development characteristics or quality would be partially changed.
Low	Small changes to the baseline resource, which are detectable, but the underlying characteristics or quality of the baseline situation would be similar to pre-development conditions.
Negligible	A very slight change to the baseline conditions, which is barely distinguishable, and approximates to the 'no change' situation.

Assessing Significance

10.4.40 The scale or level of effects is determined in relation to the sensitivity of the receptor and the potential magnitude of change from baseline conditions, using the matrix shown in **Table 10.7** of this Chapter. Effects can be negligible, minor, moderate or major. The nature of effects can be neutral, beneficial or adverse.

Table 10.7: Matrix for determining significance of effects

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

10.4.41 Guideline criteria for categories of significant effect are included in **Table 10.8** of this Chapter. Effects determined to be major or moderate significance are considered to

be significant. Effects identified as minor or negligible are not considered to have a significant effect and no further mitigation is required. In some instances, and with justification, professional judgement may be applied to either increase or decrease the assessed rating.

Table 10.8: Guideline Criteria for Categories of Significant Effect

Scale of Effect	Significant effect?	Definition	Guideline Criteria
Major	Yes	A fundamental change to the environment	Changes in water quality, quantity (including flood risk) or morphology affecting widespread catchment or groundwater resources of strategic significance or changes resulting in substantial loss of conservation value to aquatic habitats and designations.
Moderate	Yes	A large, but non-fundamental change to the environment	Changes in water quality, quantity (including flood risk) or morphology affecting part of a catchment or groundwaters of moderate vulnerability, or changes resulting in loss of conservation value to aquatic habitats or designated areas.
Minor	No	A small but detectable change to the environment	Localised changes in drainage patterns, groundwater flow or morphology, or changes resulting in minor and reversible impacts on surface and groundwater quality or aquatic habitats.
Negligible	No	No detectable change to the environment	No impact on drainage patterns, surface and groundwater quality or aquatic habitat.

Limitations and Assumptions

Basis of the Assessment

10.4.42 This Chapter assesses the potential effects resulting from the Project as defined by the **Works Plans (Doc Ref. 2.3)** and **Design Principles (Doc Ref. 7.5)**. The **Illustrative Project Layout (Doc Ref. 2.6)** has been used to allow an assessment of a specific deliverable Project and calculation of the drainage metrics, which requires a definitive design. The **Illustrative Project Layout (Doc Ref. 2.6)** presents a realistic layout in accordance with the **Design Principles (Doc Ref. 7.5)** and within the Rochdale Envelope.

10.4.43 A review of the **Illustrative Project Layout (Doc Ref. 2.6)** against the **Design Principles (Doc Ref. 7.5)** confirms that constructing and operating the Project in other ways allowed by the **Design Principles (Doc Ref. 7.5)** would not result in a greater impact to the water environment than the **Illustrative Project Layout (Doc Ref. 2.6)**.

10.4.44 The assessment has been based on parameters set out in the **Design Principles (Doc Ref. 7.5)** and **Works Plans (Doc Ref. 2.3)**. The assessment is also based in information on watercourse crossing types and locations as set out in **ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4)**.

10.4.45 Water-environment mitigation often has multiple benefits, and the assessment assumes that primary and tertiary types of mitigation are fully implemented. For example, SuDS and setbacks from watercourses are considered embedded (primary) mitigation, as they are incorporated in the design and layout of a project, but they also can provide pollution prevention benefits, which can be considered tertiary mitigation (e.g., swales / attenuation ponds used to treat sediment laden runoff, which a CEMP may require to manage construction phase runoff).

10.4.46 Tertiary mitigation, such as the CEMP (or DEMP) and standard industry good practice that are underpinned by legislation, e.g. the Construction (Design and Management) Regulations 2015[49], the Environmental Permitting (England and Wales) Regulations 2016[50], and the Control of Pollution (Oil Storage) (England) Regulations 2001[51] will be prepared and adhered to. These are therefore considered as part of the Embedded Mitigation.

10.4.47 Embedded Mitigation is described in **Section 10.6** 'Embedded Design Mitigation' of this Chapter. The assessment assumes that good practice mitigation and measures secured by the **Outline CEMP (Doc Ref. 7.8), Outline OMP (Doc Ref. 7.11)** and the **Outline DEMP (Doc Ref. 7.12)** will be considered to be current at the time of implementation.

10.4.48 The Project is assumed to have an operational lifespan of up to 40 years.

Limitations

10.4.49 The assessment is based on publicly available data obtained from the EA, ABC and commercial data supply companies, as well as additional information supplied from stakeholders during the EIA Scoping and consultation stages.

10.4.50 Detailed information on flow data for watercourses and drainage channels and water quality data for specific locations on and immediately adjacent to the Site (surface and groundwater) is not available. The baseline assessment is therefore based on observations from the site hydrological walkover, data from elsewhere within the wider catchment and professional judgement using the publicly available data.

10.4.51 The available baseline information is however considered sufficient to identify likely significant effects arising from the Project.

10.5 Baseline Conditions

Topography and Land Use

10.5.1 The Site is set along the East Stour River and the valley of the river runs from east to west through the Site. The majority of land within the Site slopes down towards the base of this valley. Topographic data of the Site is provided in **ES Volume 3, Figure 10.2: Local Topography (Doc Ref 5.3)**. A topographic survey of the Site is provided as **Annex A** of **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)**.

10.5.2 The topography of the Site is lowest at 44 m AOD within Field 19 in the north-eastern part of the Site and highest at 76m AOD at the Goldwell Lane Site access.

10.5.3 The land use within the Site generally comprises a mosaic of arable fields divided by hedgerows with small areas of woodland. There are a number of small field ditches / ordinary watercourses which span some of the existing field boundaries and convey flows into the East Stour River. Further details on hydrology are provided below in **Paragraphs 10.6.6** to **10.6.28**.

10.5.4 The Site includes a section of the East Stour River, HS1 / Network Rail railway, the Sellindge Substation and public highways.

Rainfall

10.5.5 Average rainfall data for the period from 2000 to 2023 is shown in **Table 10.9** of this Chapter. The data was obtained from the nearest EA climate station to the Site, which is located at Southern Water's Sellindge Waste Water Treatment Works approximately 50m east of the Site at National Grid Reference ('NGR') TR 08630 38196.

Table 10.9: Average Annual and Monthly Rainfall Depths

Month	Average Rainfall (mm)
January	105
February	73
March	57
April	51
May	68
June	56
July	68

Month	Average Rainfall (mm)
August	79
September	67
October	122
November	138
December	120
Annual	**1,004**

Surface Water Bodies

10.5.6 Site walkover surveys were carried out on 24 and 25 July 2023, 11 and 23 January 2024 and 7 February 2024 to investigate on-Site hydrological features and observe the characteristic of watercourses at crossing locations. A detailed record of that watercourse crossing survey is provided in **ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4)**.

10.5.7 The East Stour River, ordinary watercourses and catchment areas are shown on **ES Volume 3, Figure 10.3: Local Hydrology (Doc Ref. 5.3)**.

10.5.8 The Site is located within two surface water catchments, comprising the 'East Stour' surface water catchment, and the 'Romney Marsh between Appledore and West Hythe' surface water catchment.

10.5.9 The Site is partially within the River Stour (Kent) IDB district. This means that 'ordinary watercourses' are managed by the IDB. The East Stour River is classed as a 'main river' and is managed by the EA[52]. Main rivers and ordinary watercourses are shown on **ES Volume 3, Figure 10.3: Local Hydrology (Doc Ref. 5.3)**. Details of existing watercourse crossings over these channels that will be relied upon by the Project together with the IDB district are shown in **Annex C** of **ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4)**.

East Stour River Catchment (River)

10.5.10 The majority of the Project is located within the East Stour surface water catchment[42] (shown on **ES Volume 3, Figure 10.3: Local Hydrology (Doc Ref. 5.3)**. The East Stour River has been assessed under the WFD as having a 'Moderate' ecological status.

10.5.11 The East Stour River is a main river which flows from east to west through and away from the Site to join the Great Stour 5.7km northwest of the Site in Ashford. Upstream of the Site, the East Stour River drains a catchment area[53] of

approximately 33.7km^2. The East Stour River drains predominantly arable land (53%)[54] and grassland (34%) with only a small urban extent (<5%).

10.5.12 The East Stour River is a generally naturalised channel with vegetated banks approximately 8-12m wide and 0.7m depth through the Site. The channel has been modified around Evegate Mill House and also around the AFSA embankment.

10.5.13 The East Stour River is sourced from high permeability Chalk bedrock and flows across varying outcrops of permeable Chalk, followed by an outcrop of less permeable Mudstone confining the permeable Chalk outcrops to the north and permeable Sandstone outcrops to the south. Following the Sandstone outcrop the channel flows across an outcrop of less permeable Mudstone to the immediate north of the Site. The semi-permeable nature of the catchment is represented by a baseflow index[1] of 0.48.

East Stour River Catchment (Tributaries)

10.5.14 On its approach to, and route through, the Site, the East Stour River is joined by a number of unnamed tributaries and the Bower Road Stream. These are shown on **ES Volume 3, Figure 10.3: Local Hydrology (Doc Ref 5.3)**.

10.5.15 The Bower Road Stream is located approximately 500m northwest of the Site boundary and flows southwest to join the East Stour River; draining an approximate catchment area[53] of 1.04km^2. Bower Road Stream begins on the north side of the HS1 / Network Rail railway line (north of the Site), and is culverted beneath the railway. The channel is approximately 3-4m in width and 1m deep.

10.5.16 Unnamed Tributary 1 (Pleasuance Dyke, IDB No. 015) rises in Brabourne, 3.7km north of the Site. The channel is approximately 1.3m deep, 7m wide and flows in a south westerly direction towards the Site to discharge into the East Stour River via a culvert beneath the railway line, to the west of Sellindge Substation. Upstream of the Site, the channel drains a catchment area[53] of approximately 8.18km^2 of predominantly arable land and grassland with some rural settlements including Brabourne and Brabourne Lees.

10.5.17 Unnamed Tributary 2 (Horton Priory Dyke, IDB No. 017) flows in a south westerly direction towards the Site and discharges into the East Stour River via a culvert beneath the railway line immediately east of Sellindge Substation. The channel is approximately 9m wide and 1.3m deep. Upstream of the confluence, Unnamed Tributary 2 drains a catchment area[53] of approximately 13.1km^2 of predominantly grassland and arable land with some smallholdings present throughout.

10.5.18 Unnamed Tributary 3 (Aldington Dyke, IDB No. 014) rises from a small woodland area (Burch's Rough) approximately 2km south east of the Site and flows in a north westerly direction through the AFSA towards the East Stour River, joining at a

[11] The baseflow index of a river is considered to be the measure of the proportion of the river runoff that derives from groundwater flow and other stored sources. Higher baseflow index values are notable on permeable catchments.

confluence approximately 200m downstream of the Mill House impoundment. The channel is approximately 8m wide and 1.1m deep. Unnamed Tributary 3 drains a total catchment area[53] of approximately 4.94km^2 which is predominantly undeveloped arable land, woodland areas and some small farm holdings.

East Stour River Catchment (Other water features)

10.5.19 There are a number of unnamed ponds within the Site boundary. Two of these are located at Handen Farm and the land immediately north of the farmstead. These are sourced from a small channel / surface water flows and perched above the Weald Clay bedrock.

10.5.20 Additionally, within 2km radius from the Site boundary, there are numerous other mapped ponds of varying sizes. Other lakes in the locality are used for recreational purposes; predominantly fishing.

10.5.21 Field drains are also present across the Site along field boundaries. At the time of surveys in 2023 and 2024, the field drains were observed to hold little to no water, and to have low to no flow. Watercourses / drains were observed to be generally heavily vegetated.

East Stour River Catchment (Aldington Flood Storage Area)

10.5.22 As shown on **ES Volume 3, Figure 10.3: Local Hydrology (Doc Ref. 5.3)**, a flood storage area is present within the Northern Area across the channel and floodplain of the East Stour River. The embankment associated with the flood storage area is shown in **ES Volume 4, Appendix 10.4: AFSA Risk Assessment (Doc Ref. 5.4)**. This flood embankment structure is owned and maintained by the EA.

10.5.23 The land upgradient (east) of this embankment is referred to as the 'AFSA'. The AFSA is used to store fluvial flows from the East Stour River during periods of fluvial flooding. The EA have advised during consultation that upstream of the AFSA embankment, the AFSA provides approximately 1,280,000 m^3 of storage below the spillway crest level of 50.2 mAOD covering an area of approximately 0.74 km^2.

10.5.24 The AFSA embankment and AFSA were designed to reduce the flood flows passing along the East Stour River. Flow is able to pass through the embankment and into the downstream channel of the East Stour River through a fish pass with a 300mm diameter orifice. This restricts flows to a discharge rate of 0.34 m^3/s. When water levels are high enough some flows are diverted into Unnamed Tributary 3 via a side weir. This channel can convey up to 4 m^3/s through the embankment by means of a vortex flow control device.

10.5.25 If flows arriving at the AFSA exceed the capacity of these two routes, then water backs up and floods the land within the AFSA. This typically happens on several occasions each year. In the event that the capacity of the AFSA is exceeded water over tops the embankment via the spillway and rejoins the main channel of the river (and its floodplain) downstream.

10.5.26 Downstream of the AFSA, around Evegate Mill House, the East Stour River has been impounded to create a small reservoir feature. Mill Stream discharges from the impoundment and joins at a confluence / basin approximately 200m downstream to reform the East Stour River. Further details of the AFSA are provided in **ES Volume 4, Appendix 10.4: AFSA Risk Assessment (Doc Ref. 5.4)**.

Romney Marsh Catchment

10.5.27 A small area in the southern part of the Site (Field 8) is within the 'Romney Marsh between Appledore and West Hythe' surface water catchment (see **ES Volume 4, Figure 10.3: Local Hydrology (Doc Ref. 5.4)**). The Romney Marsh between Appledore and West Hythe surface water catchment has been assessed under the WFD as having a 'Moderate' ecological status[42].

10.5.28 There are several unnamed drains, which flow through the wooded areas (e.g., Poulton Wood, Handen Wood and Park Wood) to the south of the Site within the Romney Marsh between Appledore and West Hythe surface water catchment. A surface drain within Hamden Wood receives flows from the southern part of the Site and coveys these southwards towards Romney Marsh.

Surface Water Quality

10.5.29 The majority of the Site lies in the 'East Stour' surface water catchment area (GB 107040 019640) which had an overall classification of 'Moderate' in 2022. This is reflected by good to moderate Ecological elements albeit with ratings of 'high' for ammonia, temperature and pH. In the 2019 monitoring round, the water body failed on chemical elements due to high levels of two compound groups. These were '*Mercury and its compounds*' and '*Probrominated diphenyl ethers ('PBDE')*'. During the 2022 monitoring round, chemical elements were considered to no longer require assessment.

10.5.30 The reasons for chemical failure are derived from agricultural pollution and sewage discharge. Good status for the water body is targeted for 2063 provided that the watercourse makes a natural recovery over time. At this stage in the recovery process, (i.e., 2 years) it is not envisaged that the chemical status will have significantly improved and it is likely that the surface water quality remains poor.

10.5.31 The Site is located within the River Great Stour surface water Nitrate Vulnerable Zone with only a small section of Field 8 located outside of this zone[46]. The Site is not located in a surface water drinking water safeguard zone or surface water drinking water protection area.

Flood Risk

10.5.32 **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** includes a screening assessment for a wide range of potential flood sources which is summarised in **Table 10.10** of this Chapter.

Table 10.10: Flood Risk Screening Summary

Flood Source	Summary
Fluvial (Rivers)	The River East Stour flows through the Site and the **ES Volume 3, Figure 10.4: Flood Map for Planning (Doc Ref. 5.3)** indicates that significant areas of the Site fall within Flood Zone 2 and Flood Zone 3. **ES Volume 3, Figure 10.8: Delineation between Flood Zone 3a and 3b (Doc Ref. 5.3)** shows which areas have been designated by ABC as functional floodplain. **Screened in for further assessment**.
Tidal (Sea)	The Site is remote from the coast and all areas are significant raised above sea level. Screened out from further assessment.
Surface Water or Pluvial	EA mapping identifies elevated surface water flood risk along the East Stour River corridor and along surface water flow pathways and tributary channels of the East Stour River. **Screened in for further assessment.**
Groundwater	During extreme wet conditions groundwater within the Alluvium could emerge at the surface, but realistically this would only occur if fluvial flooding was occurring along the East Stour River and restricting onward flow. The additional land impacted by flooding resulting from groundwater flow would be negligible. It is considered that is not possible or helpful to differentiate the fluvial and groundwater components of flooding and the detailed assessment of risk for fluvial flooding will adequately define the risk. Screened out from further assessment.
Sewers	Some sewers are present on and adjacent to the Site. There is however no specific reason to believe these are vulnerable to surcharge or failure. Due to the nature of the proposed infrastructure (i.e. PV panels raised 0.8m off the ground), shallow overland flows such as could conceivably occur from sewers will not impact the Project. Screened out from further assessment.

Flood Source	Summary
Reservoirs, Canals and other Artificial Sources	EA mapping indicates that areas of the Site are at risk of flooding from a failure of the AFSA embankment which is operated by the EA. As the AFSA falls within the scope of the Reservoirs Act 1975 and is maintained and operated by the EA, it is considered that the risk of failure is very low. Screened out from further assessment.
Infrastructure Failure	The Site is not afforded protection from flood defences and therefore the risk of failure from a breach is negligible. Whilst the ASFA technically provides flood management, this is considered a reservoir, and the risk is discussed above. Screened out from further assessment.

10.5.33 EA Flood Mapping[55] presented on **ES Volume 3, Figure 10.4: Flood Map For Planning (Doc Ref. 5.3)** indicates that the majority of the Site is located within Flood Zone 1 (identified as having less than a 1 in 1,000 annual probability of river (fluvial) flooding, which is defined as 'low' probability).

10.5.34 Most of the Northern Area (Fields 26 to 29) and Fields 19, 23 to 25 of the Central Area of the Site are classified by the EA as being in Flood Zone 2 (identified as land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding, which is defined as 'medium' probability) and Flood Zone 3 (identified as land having a 1 in 100 or greater annual probability of river flooding, which is defined as 'high' probability). Parts of the Cable Route Corridor and Sellindge Substation are also located within Flood Zones 2 and 3.

10.5.35 As part of the Strategic Flood Risk Assessment[56], Flood Zone 3b (the functional floodplain) has been identified as being the flood extents for the 5% and 4% AEP (1 in 20 and 1 in 25 year) event where these have been modelled and mapped. The SFRA also notes that where Flood Zone 3b extents are not available, a precautionary approach should be followed, and Flood Zone 3 should be considered as equivalent to the functional floodplain.

10.5.36 ABC Flood Mapping from SFRA, presented on **ES Volume 3, Figure 10.8: Delineation between Flood Zone 3a and 3b (Doc Ref. 5.3)** shows the extent of Flood Zone 3a and Flood Zone 3b at the Site. This indicates that the large majority of Flood Zone 3 area within the Order limits are considered as Flood Zone 3b.

10.5.37 **Annex B** of **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** details the hydraulic modelling work. This work, which the EA have confirmed provides a suitable basis for assessing the flood risk posed to the Project, confirms that during major flow events the AFSA embankment will be overtopped. The resulting mapped flood

extents then broadly confirms the risk illustrated by the EA Flood Mapping[55] (**ES Volume 3, Figure 10.4: Flood Map for Planning (Doc Ref. 5.3)**.

10.5.38 In relation to surface water flooding, **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** concludes that that EA surface water flood modelling likely overestimates the surface water flood risks, particularly in areas where overland flows would flow in channel or be considered fluvial in nature. Areas where surface water is predicted within the fields (i.e., not in channel) generally do not exceed a depth of 0.6m during the 0.1% AEP event.

10.5.39 The risk of flooding to the Site from fluvial and surface water flooding ranges from very low to high. There are extensive areas of the Site considered to be at very low risk. Areas of elevated risk typically correspond to the corridor of the East Stour River and associated small tributary channels as well as overland flow pathways.

10.5.40 The Embedded Mitigation which forms part of the Project design incudes measures to minimise the risk of flooding from fluvial and surface water flooding. The implementation of Emergency Flood Response Plans ('EFRP') during each phase of the Project will also ensure that the effect of flooding on staff and people at the Site will also be negligible and not significant.

10.5.41 **Section 10.7** 'Assessment of Effects' of this Chapter, considers whether the risk of flooding from all sources could be exacerbated during construction, operational or decommissioning phases of the Project.

Geology and Hydrology

10.5.42 The National Soils Resources Institute, Soilscapes website[57], indicates that soils across the Site comprise of '*Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils;' 'Loamy and clayey floodplain soils with naturally high groundwater'* and *'Freely draining slightly acid but base-rich soils.* The freely draining soils typically overlay the Hythe Formation on higher ground away from the East Stour River.

10.5.43 **ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref. 5.4)** provides the findings of a ground investigation which assesses the geo-environmental characteristics of the superficial deposits of parts of the Site.

10.5.44 According to BGS published artificial ground mapping[45] and Groundsure data (provided in **ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study (Doc Ref. 5.4)**) there is no mapped Made Ground within the Site. **ES Volume 4, Appendix 11.1: Phase I Geoenvironmental and Geotechnical Desk Study (Doc Ref. 5.4)** states that during the site walkover undertaken to inform this study, *'brick gravel was identified within the surface cover material of fields indicating that reworked natural material may underly the Site. Borehole records indicate that Made Ground could extend to 8m depth across the north-eastern and central parts of the Site'.*

10.5.45 Ground investigation was carried out to investigate the potential presence of made ground (**ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref.**

5.4). Anthropogenic (man-made) materials such as brick, cement and ceramics were recorded in three trial pits (TP01, TP02, TP05) and four window samples (WS02, WS04, WS05 and WS08) to a maximum depth of 0.80 m below ground level (bgl) across the investigated area. As the materials were encountered sporadically in the ground and not in discernible bands/strata, this does not constitute definitive made ground strata and instead suggests that these materials existed at depth due to soil turnover activities such as ploughing.

10.5.46 Mapping of the superficial geology, as extracted from the British Geology Survey[45], is provided on **ES Volume 3, Figure 10.5: Superficial Geology (Doc Ref. 5.3)** and shows that the north east area of the Site is underlain by superficial deposits of Alluvium (localised to the vicinity of East Stour River corridor and its association tributaries to the south). The Alluvium deposits comprise of clay, silt, sand, and gravel. In the remaining areas of the Site there are no mapped superficial deposits. The ground investigation **ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref. 5.4)** identified superficial deposits in the form of sand, gravel and clay were recorded to a maximum depth of 5mbgl.

10.5.47 Bedrock geology at the Site is mapped on **ES Volume 3, Figure 10.6: Bedrock Geology (Doc Ref. 5.3)**. This BGS mapping[45] indicates that the Site and immediate surrounding area is underlain by three different bedrock formations:

- Weald Clay Formation – 'Dark grey thinly-bedded mudstones (shales) and mudstones with subordinate siltstones, fine- to medium-grained sandstones, including calcareous sandstone and shelly limestones. Present across the majority of the Site covering Fields 1-4, 7, 8, 10-19, 21-29 and the Cable Route Corridor area.
- Hythe Formation – 'Fine- to medium-grained, sparsely glauconitic sands, sandstones and silts, locally pebbly, with calcareous or siliceous cement in beds or lenses'. Located across Fields 9, 10, 20 and part of Fields 25 and 29.
- Atherfield Clay Formation – 'Sandy mudstone'. Thin bands located across and partially cover Fields 4-6, 8-13, 20, 22, 25, 26 and 29.

Aquifer Characteristics

10.5.48 Mapping of the aquifer characteristics is provided on **ES Volume 3, Figure 10.7: Aquifer Characteristics (Doc Ref. 5.3)**.

10.5.49 The Alluvium deposits identified on BGS mapping are classified by the EA as a Secondary A aquifer[46]. Secondary A aquifers are defined[46] (see key of mapping) as *'aquifers which comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers'*.

10.5.50 The Hythe Formation is classified as a Principal Aquifer[46], which is defined[46] (see key of mapping) as *'geology that exhibit high permeability and/or provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.'*

10.5.51 The Weald Clay and Atherfield Clay bedrock formations are classified as unproductive strata[46], which is defined[46] (see key of mapping) as *'geology which is largely unable to provide usable water supplies and are unlikely to have surface water and wetland ecosystems dependent on them'.*

10.5.52 Groundwater level data provided by the EA (Court Lodge Farm – EA data request received 21 August 2023) indicates that the water table, as extracted from a borehole 740m south east of the Site fluctuates, during the monitored time period (1972-1981) between 65.28m AOD and 67.3m AOD within the Hythe Formation. The Hythe Formation in this area is confined by bands of Weald Clay to the north and south and therefore hydraulic conductivity and subsequently groundwater flow is only possible to the east and west. Groundwater recharge is likely occurring within the band of the Hythe Formation at the Site with flows progressing to the south east.

10.5.53 The majority of the Site is not located within a WFD groundwater catchment. However, a small area of the northern part of the Site (i.e., Fields 25 and 26) is located within the 'Kent Greensand Eastern' groundwater waterbody catchment (shown on **ES Volume 3, Figure 10.7: Aquifer Characteristics (Doc Ref. 5.3)**), which has an overall WFD status of 'Poor'[34].

10.5.54 There are approximately 25 springs (i.e. water coming from underground expressed at surface) within 2km of the Site boundary. Of those, nine are located within the Kent Greensand Eastern groundwater catchment. No springs are identified within or close (within 200m) of the Site boundary.

10.5.55 1:10,000 OS mapping identifies two springs, approximately 900m north of the Site, on the north side of the M20 and south of the A20. These coincide with a geological boundary – a principal and unproductive aquifer; the Atherfield Clay Formation and the Hythe Formation (interbedded limestone and sandstone). These springs, at elevation 60-65mAOD, are likely sustained by groundwater from within the Hythe Formation. These levels roughly coincide with monitored groundwater levels provided by the EA from a borehole 740m south east of the Site.

10.5.56 The Site is not located within a groundwater safeguard zone or a groundwater SPZ[46].

Private Water Supplies, Abstractions and Discharges

10.5.57 The Site is within an area identified by the EA in 2021 as being 'seriously' water stressed[58]. According to the EA's catchment abstraction management strategy ('CAMS') for the River Stour, the water in the East Stour River cannot be relied on at all times for abstractions.

10.5.58 In response to a data request made by the Applicant in August 2023, ABC confirmed they have no records of Private Water Supplies within 2km of the Site.

10.5.59 The EA have also indicated that there are no current permitted abstractions (as of November 2023) within 2km of the Site. In this response, the EA also state that only one discharge consent is located within 2km of the Site as summarised in **Table 10.11** of this Chapter.

Table 10.11: Permitted Discharges within 2km of the Site

Site type	Permit Number	Effluent type	Property name	National Grid Reference ('NGR')	Distance from the Site
Domestic property (multiple) (including farm houses)	SO/EPRG B3498RT/001	Sewage – not water company	Red Barn Farm	TR 04452 37104	193m south west

Hydro-ecology and Designated Sites

10.5.60 With reference to Defra Magic Map[46], a number of statutory designated sites are within 2km of the Site or have been identified for consideration by statutory consultees during consultation. These are:

- **Poulton Wood LNR** – approximately 470m south of the Site boundary at its closest point and is designated for its tree species. A small watercourse flows through Poulton Wood to the south and into a watercourse called the Marshland Sewer. Poulton Wood LNR is located in the Romney Marsh between Appledore and West Hythe surface water catchment. The areas on the Site within the same surface water catchment do not drain into Poulton Wood and instead drain south towards Handen Wood, downstream of the LNR. There is therefore no hydrological connectivity between the Site and Poulton Wood LNR and this Site is scoped out of this assessment.
- **Hatch Park SSSI** – approximately 1.8km north of the Site and designated for its acidic grassland and ancient pollard woodland. There are also a number of artificial ponds with adjacent areas of marshy grassland. The existing ponds are situated on permeable strata including the Hythe Formation (Sandstone), Sandgate Formation (Sandstone, Siltstone, Mudstone) and the Folkstone Formation. The SSSI falls within the Kent Greensand Eastern groundwater body which also encompasses Fields 25 and 26 (where the Project Substation is proposed) of the Site. These ponds are artificial and will be lined with a clay/impermeable material to prevent losses to ground. These are clearly therefore surface water fed systems with no hydraulic connectivity to the regional groundwater system. Hatch Park SSSI falls within a separate surface water catchment to the Site (Aylesford Stream). The Site is therefore only connected to Hatch Park SSSI via the regional groundwater system but with no connection to the artificial pond network within the SSSI. Impacts to the SSSI are therefore assessed in **Section 10.7** 'Assessment of Effects' of this Chapter.
- **Dungeness, Romney Marsh and Rye Bay Ramsar and SPA** – located

6.5km southwest of the Site and designated for supporting bird breeding grounds and its complex network of wetland types and habitats which support diverse groups wetland species, bryophytes, vascular plans and invertebrates. The majority of the Site is not located in the same surface water catchment as Dungeness and Romney Marsh however runoff from the southern half of Field 8 does drain southwards towards the SPA. Impacts to the Ramsar and SPA are therefore assessed in **Section 10.7** 'Assessment of Effects' of this Chapter.

- **Dungeness SAC** – located 11.3km south of the Site and designated for its tidal rivers, salt marshes, bogs, inland water bodies and other coastal features. The SAC is located in a separate surface and groundwater catchment and consequently has no hydrological connectivity to the Site. This designated site is therefore scoped out of this assessment.
- **Wye and Crundale Downs SAC** – located 5.2km north of the Site and designated for its ecological purposes due to the presence of heath, scrub, grassland and woodland. The SAC is not located in the same surface water or groundwater catchment and it is concluded that there is no hydrological connectivity between the Site and Wye and Crundale Downs SAC. This designated site is therefore scoped out of this assessment.
- **Stodmarsh SSSI, SPA and Ramsar Site** ('Stodmarsh site') – located 23.76km north of the Site and designated as a SSSI for biological interest, an SAC for its inland water bodies, bogs, marshland as well as heath and woodland vegetation and an SPA due to its open water bodies, reedbeds, grazing marshes and alder-carr. The East Stour River drains down through the Stodmarsh site. While remote, flows from much of the Project will therefore ultimately drain to and through this potential receptor; however, given the distance to the Stodmarsh site there is no need or requirement to consider it as a receptor distinct and separate to the river. Due to the nature of the Project there is no requirement to avoid increases in nutrient rates (i.e., nitrogen or phosphorous). The Project does not include any new accommodation and the primary land use change will be from agriculture to PV Arrays which will result in a reduction in nutrient loading. The Applicant has committed to foul flows derived from the Site during construction, operation and decommissioning being collected and removed from the Site. All flows from these facilities will be collected and tankered from the Site for treatment and disposal at a suitably licenced facility outwith the Stour catchment (i.e. the Stodmarsh site catchment). In their 2023 S42 response, NE confirmed that an impact assessment regarding nutrient neutrality is not required for the type of development proposed. This designated site is therefore not considered further.
- **Gibbin's Brook SSSI** – approximately 2.8km east of the Site and situated within the same surface and groundwater catchment as the Site. The SSSI is designated for its biological interest of predominantly grassland and wet woodland. Whilst the SSSI clearly has some water dependence (i.e., the wet woodland), the SSSI is upstream of the Site and therefore unable to impact the SSSI hydrologically. This designated site is therefore scoped out of this assessment.

- **Otterpool Quarry SSSI** – approximately 1.85km south east of the Site and is designated for its geological interest only. The SSSI is therefore not considered water sensitive and is scoped out of this assessment.
- **Folkestone to Etchinghill Escarpment SAC** – approximately 8.7km east of the Site and designated for its natural dry grasslands on chalk or limestone, including important orchid sites. This SAC is not designated for a hydrological or hydrogeological reason and is located in a different surface water catchment to the Site. This designated site is therefore scoped out of this assessment.

AFSA

10.5.61 The AFSA is not a designated site but is used to store water during periods of fluvial flooding along the East Stour River and prevent downstream flooding. The Project has been designed to ensure that it will not impact on the current or future functioning of the AFSA. The **Illustrative Landscape Drawings (Doc Ref. 2.7)** include small depressions and scrapes proposed within the AFSA which are proposed for landscape and biodiversity enhancement. These features will increase the available flood volume in the AFSA without impacting on its function or efficacy.

10.5.62 A risk assessment of the AFSA is provided as **ES Volume 4, Appendix 10.4: AFSA Risk Assessment (Doc Ref. 5.4)** and demonstrates there will be no impact on the function or efficacy of this feature. Impacts to the AFSA are therefore not considered further in the assessment.

Other Receptors

10.5.63 **ES Volume 3, Figure 9.7: Water Body Location Plan (Doc Ref. 5.4)** shows the location of a number of small ponds on the Site. Given their location, these are clearly perched on top of clay bedrock with water sourced from overland flow and minor ditches. These ponds are used primarily for amenity purposes and based on a review do not appear to be hydrologically connected to the groundwater table or any of the larger surface water features. All ponds are being retained and there is a minimum set back of 3.2m from these features where no infrastructure will be constructed as secured through the **Design Principles (Doc Ref. 7.5)**. On this basis, the on-Site ponds and lakes are not considered further in the assessment.

10.5.64 Larger lakes are present within the AFSA. These are not assessed further as they are located upgradient of the main area of works on the Site. They are also not directly affected by or situated downgradient the proposed cable route or the landscape and ecological works proposed within the AFSA so would be unaffected by these activities.

10.5.65 Springs (groundwater emergence) exist in the study area. These are however all on higher ground upgradient of the Site. As these features are upgradient of the Site there is no hydrological pathway for impact and they are not considered further in the assessment.

10.5.66 Some lanes and gardens within the study area are understood to be subject to extreme fluvial and pluvial flooding. The Project will seek to mimic or provide

betterment from the existing regime but is not specifically designed to reduce flood risk to the surrounding areas. The **Outline OSWDS (Doc Ref. 7.14)** demonstrates compliance with local and national policy and guidance and presents a drainage strategy which mimics the existing regime in terms of runoff rates. The Project should therefore have no adverse impact on the surrounding lanes and gardens. As there should be no change from baseline conditions, these features are not considered further in this assessment.

10.5.67 The PEIR considered field underdrainage as a receptor. While important as a potential flow pathway, or (if broken) a cause of flooding, such artificial, engineered installation are not important hydrological features and as such are not considered in this assessment. Any implications or damage to field underdrainage (i.e., piped networks) that occur through development would however be rectified as part of the construction process. This is secured through the **Outline CEMP (Doc Ref. 7.8)**.

Future Baseline

10.5.68 For this assessment, a future baseline year of 2026 is assumed for the construction phase of the Project. The Project is expected to be operational in 2027 for a period of 40 years and therefore potential changes in the future baseline are considered during this period due to climate change.

10.5.69 In the absence of the Project it is likely that the future baseline hydrology, hydromorphology and water quality for all watercourses within the study will remain relatively constant, albeit with minor changes to flow reflecting long term patterns for rainfall associated with climate change. These include wetter winters and drier summers, but with an increase in heavy rainfall events. Agricultural practices will continue to contribute to nitrates and phosphates entering the hydrological environment.

10.5.70 With regards to the hydrological and hydrogeological environment, the main future changes from the current baseline scenario would relate to climate change. It is widely accepted that the UK climate is likely to become move variable with projected increases in peak rainfall depths, sea levels, wind speed and wave height which inherently increases the prevailing flood risk.

10.5.71 The UK Climate Projections ('UKCP18')[59] are available on the Meteorological Office website, for the South East River Basin District where the Site is located. **Table 10.12** of this Chapter presents the percentage change in precipitation for the 90th percentiles for four emission scenarios for winter and summer periods for the available time slices, referred to as Representative Concentration Pathways ('RCPs'). For the majority of the emission scenarios and time slices UKCP18 predicts wetter winter and summer conditions, predicating +10% to +50% changes.

Table 10.12: Projected Change in Precipitation (%) for the South East River Basin District for the Winter and Summer Periods

Season	Winter			Summer		
Time Slice	2020 – 2039	2040 – 2059	2060 – 2079	2020 – 2039	2040 – 2059	2060 – 2079
RCP2.6	+30%	+30%	+30%	+20%	+10%	+10%
RCP4.5	+30%	+30%	+40%	+20%	+10%	+10%
RCP6.0	+30%	+30%	+40%	+20%	+10%	+10%
RCP8.5	+30%	+40%	+50%	+20%	+10%	+10%

Notes: Average rainfall does not include provision for evaporation and evapotranspiration.
RCPs are scenarios of future concentrations of greenhouse gases and other forcings.
RCP2.6 = 1.6°C (0.9-2.3°C) change in global temperature by 2081-2100
RCP4.5 = 2.4°C (1.7-3.2°C) change in global temperature by 2081-2100
RCP6.0 = 2.8°C (2.0-3.7°C) change in global temperature by 2081-2100
RCP8.5 = 4.3°C (3.2-5.4°C) change in global temperature by 2081-2100

* 90th Percentile selected – the three percentiles (10th, 50th and 90th) reflect the likelihood of those temperatures occurring under that emissions scenario.

10.5.72 EA guidance[60] also sets out how changes in rainfall patterns, as indicated in UKCP18 data may affect peak fluvial flows within watercourses. EA guidance[36] indicates that by the end of the projected lifetime of the Project, peak fluvial flow may be up to 55% higher than is currently the case. Hydraulic modelling detailed in **Annex B** of **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** incorporates this climate change allowance.

10.5.73 Guidance indicates that climate change will result in extreme weather resulting in potentially larger and more frequent pluvial and fluvial flood events. This is, however, not an immediate change and some natural watercourses and designated sites will adapt over time to such changes, including increasing channel capacity to control greater flows through erosional processes.

10.5.74 Whilst climate change is envisaged to result in more extreme rainfall patterns with local increases in average rainfall, it may also result in more frequent and prolonged drought conditions. Hatch Park SSSI and Dungeness, Romney Marsh and Rye Bay Ramsar and SPA contain sensitive hydrological elements such as ponds and marshlands which may become dry during periods of prolonged drought. On this basis the future sensitivity of these two designated sites remains as high. There are

no known major surface or groundwater abstractions locally or within 2km which may be sensitive in future following drought.

10.5.75 The Site is currently within an area identified as being 'seriously' water stressed. Exacerbated water stress due to climate change would be a detectable change irrespective of the Project.

10.5.76 Although there is some uncertainty, there are no other anticipated changes to the hydrological or hydrogeological environment throughout the anticipated lifetime of Project.

Summary of Receptors and Sensitivity

10.5.77 **Table 10.13** of this Chapter provides a summary of the water environment receptors and their sensitivity.

Table 10.13: Summary of Receptor Sensitivity

Receptor	Sensitivity (Value)	Description
Existing		
Main Rivers (East Stour River)	Medium	Major river system which is designated as a Main River but with no ecological designations or other regionally or nationally important characteristics.
Ordinary Watercourses (other channels and watercourses)	Low	Localised channel with no ecological designations or other regionally or nationally important characteristics.
Groundwater (Principal Aquifer – Hythe Formation)	High	Principal Aquifer – important regionally for water sources.
Hatch Park SSSI	High	Ecological site with national designations.
Dungeness Romney Marsh and Rye Bay Ramsar and SPA	High	Ecological site with national designations.
Future		
(as above)	(as above)	

10.6 Embedded Design Mitigation

10.6.1 The Project has been designed, as far as possible, to avoid and minimise adverse impacts and effects on the water environment through the process of design

development, and by embedded design measures into the design. As part of the project design process, a number of measures have been proposed to reduce the potential for impacts on the water environment study area.

10.6.2 The basis of the assessment in **Section 10.7** 'Assessment of Effects' of this Chapter is that both primary and tertiary mitigation measures will be delivered, comprising the Embedded Mitigation for the EIA. Where the impact assessment identifies likely significant effects, additional (i.e. secondary) measures are described in **Section 10.9** 'Additional Mitigation, Monitoring and Enhancement Measures' of this Chapter). The residual effects are therefore the effects anticipated once both Embedded Mitigation and Additional Mitigation have been taken into consideration.

Construction Phase

10.6.3 Construction of the Project will take place in accordance with a CEMP. An **Outline CEMP (Doc. Ref. 7.8)** has been developed for the Project which details the measures that will be taken during construction to mitigate effects on the water environment with additional location specific information as appropriate. The **Outline CEMP (Doc Ref. 7.8)** provides the framework for detailed CEMP(s) to be produced.

10.6.4 The **Outline CEMP (Doc Ref. 7.8**) includes good practice methods that are established and effective to which the Project will be committed through the DCO. These measures are designed to prevent adverse impacts in relation to flood risk, surface water drainage and pollution control of oils, sediment, cements and other polluting sources which may be hazardous to the water environment. These measures are described in **Paragraphs 10.7.8** to **10.7.25** of this Chapter.

10.6.5 Following granting of the DCO, detailed CEMP(s) in accordance with the **Outline CEMP (Doc Ref. 7.8)** will be developed to include detail regarding the approach for construction and mitigation to protect the water environment.

10.6.6 A Construction Method Statement ('CMS') based on detailed design of the Project will form part of the detailed CEMP(s), as secured by the **Outline CEMP (Doc Ref. 7.8)**. This will provide the detailed design and expand upon the approach to key activities and components such as the temporary watercourse crossings and HDD method of watercourse crossing.

Flood Risk

10.6.7 The siting of the Cable Route Corridor, Cable Route Crossing, Project Substation and the construction internal haulage road have been designed to avoid, where possible, direct impacts on existing drainage networks and features. The following flood risk embedded mitigation measures are secured through the **Outline CEMP (Doc Ref. 7.8)**:

- Two of the Secondary Construction Compounds (in Fields 19 and 23) are located within areas shown as fluvial floodplain on EA mapping. Field 23 is also in an area of high risk of surface water flooding. The FRA concludes is the risks are predominantly fluvial (**ES Volume 4, Appendix 10.2: FRA**

(Doc Ref. 5.4)). These compounds will only be used to store PV panels and associated frames;

- Potentially polluting materials will be located on construction compounds not at risk of flooding;
- If field underdrainage is encountered, measures to avoid damage or disruption to the underdrainage system will be implemented, by micro-siting excavations. Where this is not practicable, field underdrainage would, in consultation with the landowner, be diverted or replaced;
- Stockpiles used during the construction stage will be kept to minimum possible size with gaps to allow surface water runoff to pass through;
- Stockpiling will be avoided within the fluvial floodplain (Flood Zone 3), within the AFSA and in any other areas known to be at risk of surface water flooding;
- Drainage will be provided across the Site as construction works progress which will ensure that the flood risk to PRoWs is not exacerbated through the Project; and
- An EFRP is secured through the **Outline CEMP (Doc Ref. 7.8)** and will set out actions that will be implemented in the event of flooding or the issue of a flood alert or warning during construction works. This includes procedure for securing or relocating materials stored in bulk and evacuation routes for personnel on-Site.

Watercourse Crossings

10.6.8 **ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4)** sets out the number, locations and types of watercourse crossings required for the Project. These are summarised below.

10.6.9 Watercourse crossings for vehicles required to facilitate access to the Project and permanent footbridges to accommodate diverted PRoW will be subject to separate detailed design and consent applications made (as appropriate) to either the EA or IDB. Permitting requirements are discussed further in **Paragraph 10.7.66** of this Chapter.

10.6.10 Crossings required over both the East Stour River and IDB managed watercourses will be free span brides to avoid impacts to the channel and minimise on-Site engineering. The bridge soffits will be set at least 600mm above the adjacent bank level and the bridge supports will be set at least 1m back from the edge of the top of bank. The track approach to the temporary watercourse crossings will be kept at grade. These measures are secured by the **Design Principles (Doc Ref. 7.5)**.

10.6.11 **ES Volume 4, Appendix 10.5: Schedule of Watercourse Crossings (Doc Ref. 5.4)** provides indicative locations where cable crossings are required beneath watercourses and the works required.

10.6.12 Where HDD methods are proposed, cable entry and exit points within transition pits will be sealed with an appropriate water proofing material (as secured by the **Outline CEMP (Doc Ref. 7.8)**) to mitigate pollution incidents resulting from below ground

flow into the excavation. Where the HDD is beneath the East Stour River, a minimum depth of 2m from the bed of the East Stour River will be maintained. In order to achieve this depth, the entry and exit pit locations for HDD will need to be set back at least 10m from top of the bank / channel edge (as secured by the **Design Principles (Doc Ref. 7.5)**).

10.6.13 The exact dimensions of the cable entry and exit points / pits for HDD will be determined by the prevailing ground conditions but will be kept to a safe minimum in terms of length, width and depth. The ingress of any groundwater will be managed through the pit design as well as a pumping and treatment system (i.e., sediment traps).

10.6.14 HDD will be undertaken by a specialist contractor and the water column above the drill path will be continuously monitored during drilling. Whilst drill fluid leakage into a watercourse is uncommon, if leakage of bentonite water is observed in the watercourse or there is an increased perceived risk (e.g. lack of drilling mud returns) the drilling/boring operation would be suspended, remedial action implemented, and subsequently the methodology for that crossing re-evaluated. It may be that the excavation, or boring, in that area must take place at a deeper depth than below the bed of the watercourse to minimise environmental impacts.

10.6.15 Details of the HDD drilling process will be agreed as part of the detailed CEMP(s) and relevant consents/licenses.

Surface Water Drainage

10.6.16 During construction, temporary management (attenuation) of surface water will be required in any areas where significant earthworks are required. This will include the Project Substation and Inverter Stations. For each of these areas a construction surface water drainage scheme will be developed and provided as part of surface water management measures as secured by the **Outline CEMP (Doc Ref. 7.8)**. The following measures are secured by the **Outline CEMP (Doc Ref. 7.8)**:

- Where reasonably possible, operational surface water drainage features will be constructed in advance of general construction activities in a given area and allowed to stabilise to create features to intercept runoff from areas where works are occurring;
- Shallow drainage will be installed in advance of construction in areas where shallow soil conditions are permeable and where compaction of soils is considered a significant risk;
- Secondary Construction Compounds (Work No. 7) will be unsurfaced and fuel / oil will not be stored in these areas. Construction laydown areas will generally be unsurfaced. Laydown areas may also be used as temporary storage and distribution locations for construction materials, but no fuel or oil will be stored in these areas unless they are surfaced (e.g. Inverter Stations);
- The internal haulage road will comprise ground protection mats and will be permeable to avoid changes to the current flow of surface water;

- The time excavations are left open will be kept to a minimum to avoid ingress and removal of water. Excavations will be reinstated as soon as practicable once construction works are complete;
- Where appropriate, temporary cutoff drains will be installed to prevent surface water and shallow throughflow entering excavations. Treated / clean water would be discharged downstream of the excavation and encouraged to infiltrate into the ground mimicking natural flow patterns; and
- No stormwater outfalls are proposed into the East Stour River. Stormwater outfalls to ordinary watercourses will be set back from the channel and instead, will have a diffuse outfall via a vegetation buffer, reducing the risk of scour.

Pollution Control: Oils

10.6.17 The following pollutant control measures for oils are secured through the **Outline CEMP (Doc Ref. 7.8)**:

- Areas at risk of pollutant spillage, including construction compounds, vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) will be bunded and carefully sited to minimise the risk of hazardous substances entering drainage systems or local watercourses;
- Primary Construction Compounds will have impermeable bases to limit the potential for migration of contaminants into groundwater following any leakage/spillage. Primary Construction Compounds will include bunded areas used to store fuel, oil etc. which will have a 110% capacity;
- All fuel, oils and other polluting substances will be securely stored in suitably bunded containers on impermeable surfaces in accordance with GPP261 and GPP862. The total quantity and range of potential pollutants to be used on-Site is anticipated to be small;
- Static machinery and plant will, where practicable, have integral drip trays of 110% of the capacity of the fuel tank;
- The use of biodegradable oils and lubricants will also be used, where practicable;
- Refuelling will be undertaken in a designated and lined refuelling area;
- Machinery will be routinely checked to ensure it is in good working condition to reduce the risk of leaks;
- Any tanks and associated pipe work containing oils and fuels will be double skinned and be provided with intermediate leak detection equipment;
- A spill procedure will be documented, and spill kits kept in the vicinity of potentially hazardous materials storage areas. All staff will be trained on the use of these spill kits; and
- Any visual/olfactory signs of contamination encountered during excavation should be reported and investigated.

Pollution Control: Sediment

10.6.18 Disturbance to areas close to watercourses will be reduced to the minimum necessary for the work. A standoff will be observed along watercourses within which no works (except essential works such as temporary crossings, permeant footbridges, HDD crossings and construction of surface water outfalls) will be undertaken. There will be a 10m buffer from the East Stour River and IDB-managed watercourses, as secured through the **Design Principles (Doc Ref. 7.5)**.

10.6.19 The following pollutant control measures for sediments are secured through the **Outline CEMP (Doc Ref. 7.8)**:

- Excavated material will not be placed or stored within the standoff zones along watercourses. Material will be placed in such a way as to avoid any disturbance of areas close to the banks of watercourses and any to prevent spillage into water feature;
- Surface water flowing into work areas and excavated trenches during the construction period will be pumped via settling tanks or ponds to remove sediment and potential contaminants, before being discharged into local ditches or drains via temporary interceptor drains. Where gradients on-Site are significant, trenches will include a hydraulic brake (such as natural clay seals) to reduce flow rates along trenches and hence reduce local erosion;
- Appropriate measures will be adopted to prevent and control the release of sediment depending on the circumstances and nature of the works. These measures include surface water being directed across vegetated zones, or through mesh fencing, to capture sediment, as appropriate. Alternatives, such as sediment traps or settlement lagoons, may also be considered if the quantity of sediment laden water is anticipated to be large;
- Sediment control measures, drains and potholes will be regularly inspected and cleared / infilled / repaired;
- Sediment fences will be installed along watercourses when unavoidably working in close proximity to prevent sediment being washed into watercourses;
- Covers will be used by lorries transporting materials to or from the Site to prevent releases of dust / sediment to watercourses or drains;
- Subject to the nature of the material stockpiled materials should be on an impermeable surface to prevent leaching of contaminants and covered when not in use to prevent materials being dispersed by wind or rainfall runoff;
- Strip soils and vegetation clearance to only occur during dry conditions with scheduling of significant earthworks to avoid extreme wet periods;
- Use of track mats to prevent unnecessary soils compaction, damage to vegetation, and/or erosion;
- Grass seeding will be undertaken as soon as reasonably possible after installation of panels or completion of other work to encourage grass

regrowth. Once cables are laid, all trenches will be backfilled and reinstated to the existing ground level and seeded to reduce the risk of runoff of fine sediments into watercourses; and

- Plant and wheel washing facilities will be provided as required. These will be located within the designated hard standings at least 10m from the nearest watercourse or surface water drain. Runoff from the facilities will be captured within a purpose designed system for recycling and re-use where possible within the Site. Settled solids will be regularly removed and disposed of by an appropriately licensed contractor.

Pollution Control: Cement

10.6.20 The following pollutant control measures for cement are secured through the **Outline CEMP (Doc Ref. 7.8)**:

- Where reasonably practicable, precast concrete will be used in preference to wet pouring of concrete;
- No concrete batching will be permitted within the Site and all concrete delivery vehicles will be required to return to appropriate controlled and licenced facility for washout;
- Smaller equipment washout will occur in a lined and bunded area and all resulting liquid will be managed in line with EA's RPS 235[63];
- Cement/concrete mixes will be calculated to ensure that sufficient quantities are supplied (without needing to dispose of any excess), and that the cement/sand mix ratio will be monitored for consistency and suitability;
- Pouring of concrete for foundations will take place within well shuttered pours to prevent egress of concrete from the pour area; and
- Pouring of concrete or cement bound sand during adverse weather conditions will be avoided, where possible.

Pollution Control: Other

10.6.21 Welfare facilities will be provided on-Site during the construction phase for the expected peak of 199 workers. The following measures related to waste water are secured through the **Outline CEMP (Doc Ref. 7.8)**:

- All flows from these facilities will be collected and tankered from the Site for treatment and disposal at a suitably licenced facility outwith the Stour catchment;
- Welfare facilities will not be provided in the Secondary Construction Compound that is at risk of flooding (Fields 19 and 23); and
- All welfare facilities will be sited out of the floodplain and away from watercourses.

10.6.22 The **Outline CEMP (Doc Ref 7.8)** also requires that pollution incident response plans form part of the detailed CEMP(s) which will identify the type and location of on-Site resources (e.g. spill kits, absorbent materials, oil booms etc.) available for the control of accidental releases of pollution and other environmental incidents.

10.6.23 Training will be provided to staff in the use of spill kits and briefing will be included within the site induction highlighting the importance of water quality, the location of watercourses and pollution prevention measures.

10.6.24 Monitoring of water quality is proposed as set out under **Section 10.10** of this Chapter.

Operational Phase

10.6.25 The following sub-sections represent primary mitigation of relevance to the water environment assessment.

Flood Risk

10.6.26 Works within the AFSA are all upgradient of the flood defence embankment and are restricted to:

- Below ground infrastructure associated with the Grid Connection Cable within the Cable Route Corridor shown on the **Works Plans (Doc Ref. 2.3)**; and
- Landscape and drainage works as shown on the **Illustrative Landscape Drawings – Not for Approval (Doc Ref. 2.7)**.

10.6.27 There would be no uplift in ground level in this area. The following mitigation measures for flood risk are secured either through the **Design Principles (Doc Ref. 7.5), Works Plans (Doc Ref. 2.3)** or the **Outline OSWDS (Doc Ref. 7.14).**

10.6.28 An 8m standoff has been applied to the AFSA embankment. No permanent physical infrastructure will be developed within this zone. The only temporary development within this buffer zone will be approximately 40m of the internal haulage road associated with Work No. 7, during the construction and decommissioning phases. The internal haulage road will comprise a permeable surface (such as ground protection mats) for vehicles to drive over and no excavation works are expected.

10.6.29 A slightly extended buffer zone around the AFSA embankment has been provided by the EA including access areas to the north. This extended buffer zone is illustrated within **Annex B** of **ES Volume 4, Appendix 10.4: AFSA Risk Assessment (Doc Ref. 5.4).** The Primary Access Track and Cable Route into the Project Substation pass through this extended buffer area but are located away from the flood defence asset and on natural high ground.

10.6.30 A minimum 10m buffer (as measured from the top of the bank or channel edge under normal flows) will be provided from the East Stour River and the IDB-managed watercourse Unnamed Tributary 3 (Aldington Dyke, IDB No. 014) which conveys flood flows from the Stour catchment. No permanent physical infrastructure (other than essential works such as cable crossings, watercourse crossings, drainage) will be developed within this zone. As shown on the **Works Plans (Doc Ref. 2.3)** no works are proposed near any of the other channels that are formally maintained by the IDB.

10.6.31 As secured by the **Design Principles (Doc Ref. 7.5)** and the **Works Plans (Doc Ref. 2.3)**, a minimum buffer of 3.2m will be applied between any fence and all ordinary watercourses (referred to as drains or channels). This is to ensure that access for maintenance is possible to these channels.

10.6.32 The development platform level of the Project Substation will be no greater than 56m above Ordnance Datum ('AOD') and no lower than 55m AOD which is 5.6m and 4.6m higher, respectively, than expected maximum design flood level of 50.4m AOD. SuDS required for hydraulic control of stormwater associated with the Project Substation will be sited in areas that are currently above 53m AOD (SuDS locations are secured through the **Outline OSWDS (Doc Ref. 7.14)**).

10.6.33 All Inverter Stations are located outside fluvial Flood Zone 2 or 3 extents and areas of high surface water flood risk.

10.6.34 The extension to Sellindge Substation will be within Flood Zone 3. **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** demonstrates that under design condition, this area could flood, but the flood depth will be shallow and electrical infrastructure are assumed to be raised such that it will be unaffected by flooding.

10.6.35 The extension to the Sellindge Substation will be constructed at the same level as the existing substation. The extension extends into a large, raised embankment. This will therefore only involve lowering of ground levels and so will likely increase the available flood storage.

10.6.36 The Cable Route Corridor, within which the Grid Connection Cable will be sited, extends through areas of Flood Zone 3. Once in situ, the Grid Connection Cable will be water compatible and situated below ground, thus it will have no impact on flood risk.

10.6.37 The SuDS drainage features for the control of storm flows from the Project Substation and Inverter Stations, as described within the **Outline OSWDS (Doc Ref. 7.14**), are all located outside of the floodplain as demonstrated by mapping contained as **Figure 10.2.7** in the **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)**.

10.6.38 PV panels are mainly located within Flood Zone 1 and areas at low risk of surface water flooding.

10.6.39 The minimum height of the lowest part of the PV panels will be 0.8m above ground level. As PV panels are only proposed in locations where flood depths are below 0.8m they will always be above the design flood level in each Field.

10.6.40 Flood compensation storage will be provided to account for the loss of flood storage in the fluvial floodplain (i.e. within Fields 19, 23 and 24) associated with the legs of the metal framed structures on which the PV panels will be mounted. Some of the foundations for PV mounting structures could be a pre-cast reinforced concrete blocks or similar that are set on the ground surface, although it is not expect that this will be required often. If required in areas of the floodplain, this would result in small

and localised losses of flood storage. The flood storage created through the depressions included within the **Illustrative Landscape Drawings (Doc Ref. 2.7)** will however more than compensate for these small and isolated losses. If necessary, the depression storage areas would be extended to ensure there is no net loss in storage even if this resulted in the loss of rows of PV arrays.This is secured through the **Outline OSWDS (Doc Ref. 7.14).**

10.6.41 A requirement in the **Draft Development Consent Order (Doc Ref. 3.1)** requires that prior to the operation of the authorised development a detailed OSWDS in accordance with the **Outline OSWDS (Doc Ref. 7.14)** for the operation of the authorised development must be approved by ABC.

10.6.42 Security fencing in Fields 19, 23, and 24 (within floodplain downstream of the AFSA) will be raised at least 0.2m from the ground to minimise the potential to create a barrier to flood flows. This measure is secured through the **Design Principles (Doc Ref. 7.5)**.

10.6.43 The internal access tracks will extend through areas of Flood Zone 3, however these will be a 90% permeable and constructed at grade so that it will have a no impact on flood risk. These measures are secured through the **Design Principles (Doc Ref. 7.5)**.

10.6.44 Due to residual flood risks at the Site, an EFRP is secured through the **Outline OMP (Doc Ref. 7.11)**.

Pollution Control

10.6.45 The Project would contain potential pollutants which could include cooling oils, lubricants, fuels, greases, etc. The operation and maintenance of the Project would follow industry standard practice in line with the prevailing guidance and legislation regarding measures such as the storage and management of potentially polluting substances, emergency spill response procedures, clean up and control of any potentially contaminated surface water runoff and routine inspection to prevent or contain leaks of any pollutants.

10.6.46 The transformers proposed within the Project Substation will contain oil. These will be double lined and subject to regular check and, as required, maintenance, to ensure that there are no leaks.

10.6.47 The above measures will be secured through the OMP which will be developed in line with the principles set out in the **Outline OMP (Doc Ref. 7.11)**.

Firewater Storage

10.6.48 There is a potential for risk of fire at the BESS Units, and, to a lesser degree for other infrastructure within the Inverter Station and at the Project Substation. Water and foams applied to and around this infrastructure to control such an occurrence (i.e. fire water) pose a potential source of pollutants. The Inverter Stations and Project Substations compounds will be constructed with an impermeable lining and with stormwater storage provided above this within a gravel subbase. A control point

/ shut off valve will be provided on the storm water outfall so that polluted flows from this source can be retained within the platform areas.

10.6.49 The **Outline OSWDS (Doc Ref. 7.14)** sets out principles of how polluted water, such as could arise following a fire, would be retained within the platforms of both the Inverter Stations and the Project Substation. Significant storage volumes are provided within the concept design and at the detailed design stage checks will be made to confirm that sufficient storage is provided to contain possible maximum volumes of polluted water. If determined as necessary through detailed design, the volume of water that could be contained within the platform could readily be increased by raising the bunded height.

10.6.50 Firewater collected and retained within the affected compound area would be pumped to tanker and removed from Site for treatment and disposal at a suitable licenced facility. Following a fire event, the drainage network will require an assessment to confirm the absence of any contaminants prior to the penstock being released. The Project operator will be responsible for conducting a controlled flushing of the drainage network prior to opening the shut off valve.

10.6.51 As mentioned above, a requirement in the **Draft Development Consent Order (Doc Ref. 3.1)** requires approval of a detailed OSWDS by ABC prior to operation of the authorised development. The above management measures are secured by the **Outline OSWDS (Doc Ref. 7.14)**, the **Outline BSMP (Doc Ref. 7.16)** and **Outline OMP (Doc Ref. 7.11)**.

Surface Water Drainage Strategy and Management

10.6.52 In accordance with planning policy guidance (as outlined in **ES Volume 4, Appendix 10.1: Water Environment Legislation, Planning Policy and Guidance (Doc Ref. 5.4)**) runoff from the impermeable areas of the Project requires attenuation to ensure no increase in surface water discharge rates and to provide water quality treatment of runoff water.

10.6.53 Surface water drainage will be provided for the Project Substation, Inverter Stations and the Intermediate Substation in accordance with the **Outline OSWDS (Doc Ref. 7.14**) and measures will also be provided down gradient of the PV panels to assist in managing runoff from the land. These measures are summarised below per feature. As mentioned above, a requirement in the **Draft Development Consent Order (Doc Ref. 3.1)** requires approval of a detailed OSWDS by ABC prior to operation of the authorised development.

10.6.54 The **Outline OSWDS (Doc Ref. 7.14)** takes into account climate change (1 in 100 year plus climate change event) and will ensure that peak rates of surface runoff from these areas are controlled, that infiltration of runoff is encouraged (subject to pollution control considerations) and that low levels of pollution from these developed areas are appropriately managed through the use of settlement basins, filtration areas and / or silt traps etc.

10.6.55 The **Outline OSWDS (Doc Ref. 7.14)** follows current industry standard guidance (CIRIA C753)[64] and will restrict flows to greenfield rates whilst providing sufficient water quality mitigation in line with the Simple Index Method[30].

Project Substation

10.6.56 As set out in the **Outline OSWDS (Doc Ref. 7.14)**, stormwater which falls on the Project Substation platform will percolate into the void space of gravel compound. Flows will be attenuated into the compound restricted by an orifice before outfalling into a series of gabion baskets for energy dissipation at the toe of the platform. Surface water will then be piped from the gabion basket into an attenuation swale. Flows from the swale will be restricted by an orifice into a wetland feature which serves to provide the final tier of water quality treatment.

Inverter Station

10.6.57 The **Outline OSWDS (Doc Ref. 7.14)** sets out that runoff which is shed from built infrastructure will percolate into a gravel subbase which forms the Inverter Station compound. The subbase will provide attenuation for the critical 1 in 100 annual probability event plus climate change whilst restricting flows using a hydrobrake to greenfield rates. Flows will discharge from the Inverter Station compounds via a filter drain into surface waters. A control point / valve will be provided on the storm water outfall so that polluted flows from this source, in the event of a contamination incident, can be retained within the platform areas.

Sellindge Substation

10.6.58 An extension to the Sellindge Substation platform is required to accommodate the electrical infrastructure required to connect the Project to the national grid. This will likely be constructed as a compacted gravel compound as per the existing Sellindge Substation which be an extension to the existing platform of up to 0.05ha. Much of the rainfall falling on this surface will continue to discharge to the ground, particularly in drier summer periods.

10.6.59 Storm water drainage will be provided to capture and mange excess flow with runoff directed into National Grid's existing drainage network at Sellindge Substation. If considered necessary at the detailed design stage minor upgrades would be implemented to ensure that there is no net uplift in runoff and no increase in flood risk.

PV Panels

10.6.60 Installation of PV panels will not generally involve the introduction of hardstanding at ground level meaning the superficial cover for the Project will remain largely the same as the baseline. Irrespective of the nature of the PV panel mounting structure foundation type (metal piles or concrete pads), depression storage in the form of swales will be provided in down gradient areas to intercept runoff shed from the Site and encourage infiltration to ground.

10.6.61 If infiltration testing at detailed design stage (secured through the **Outline OSWDS (Doc Ref. 7.14)**) indicates that these depressions will not be able to naturally drain

down (through infiltration into soils and alluvium) a slot drain back filled with permeable granular fill will be installed on the downgradient side to allow water to slowly seep out onto the down gradient land. This will ensure that the depressions storage areas can drain down between storm events. These SuDS features should ensure there is no net increase of runoff from the Site.

10.6.62 The PV Arrays will have regular rainwater gaps to prevent water being concentrated along a single drip line. To limit possible channelisation from surface water runoff from PV Arrays and promote interception and infiltration potential throughout the Site, the ground surrounding and between the PV Arrays will be planted with species rich grassland (see the **Illustrative Landscape Drawings (Doc Ref. 2.6)**) which will act as dripline planting. This will allow surface water which falls from the drip line across the face of PV Arrays to be intercepted by the vegetation. This will limit the potential of surface water to concentrate and run across the PV panel surface and into the surrounding hydrological network, which during extreme events and on steeper topography can lead to soil erosion and furrowing.

Foul Water Drainage

10.6.63 Welfare facilities will be provided for site operatives at the Project Substation ancillary building which will comprise toilets and a kitchen. Foul water associated with operational use of the Site will be limited due to the expected number of operatives and will be stored within a cess tank within the confines of the Project Substation compound. The cess tanks will be managed, maintained, inspected and drained by a licensed courier. All flows from these facilities will be collected and tankered from the Site for treatment and disposal at a suitably licenced facility outwith the Stour catchment.

10.6.64 These measures are secured through the **Outline OMP (Doc Ref. 7.11)**.

Operation and Maintenance of Drainage Infrastructure

10.6.65 The **Outline OSWDS (Doc Ref. 7.14)** sets out that it will generally be the responsibility of the Applicant or associated third-party contractor to maintain effective drainage measures. However maintenance and operation of the Sellindge Substation will be the responsibility of National Grid and/or UKPN.

Permits / Consents

10.6.66 The **Schedule of Other Consents and Licenses (Doc Ref. 3.4)** sets out what consents and permissions are expected to be required for the Project, although subject to detailed design it is possible that other consents could be needed. The expected requirements include the following consents / permits relating to the water environment:

- FRAP – obtained from the EA for any works on a main river or within 8m of the top of the bank of a Main River, thus including temporary crossings above and HDDs and below the East Stour River;
- FRAP – obtained from the EA for any works within 8m of the or toe of a flood defence structure or otherwise within the mapped buffer around the

AFSA embankment, thus including the Internal Haulage Road and the Primary Access Track and Cable Route into the Project Substation.

- FRAP – obtained from the EA for any excavations within 16m of the top of the bank of a Main River or toe of a flood defence structure, thus including certain sections of the cable route;
- IDB Land Drainage Consent – obtained from the River Stour IDB for any works to an IDB managed drain or other channels (not main river) that fall within the IDB area. This will include temporary crossings, permanent crossings, HDD, cable trenching and the construction of surface water outfalls; and
- Water Discharge Activity Permit – obtained from the EA for any discharge liquid effluent or waste water into surface waters. This will include the discharge of any water pumped from excavations during the construction phase.

10.6.67 It is also noted that KCC Land Drainage (Ordinary Watercourse) Consent – would need to be obtained from KCC, as the LLFA, for any works to ordinary watercourses that do not fall within the IDB area. Based on the **Works Plans (Doc Ref. 2.3)** no such works are expected to be required.

10.6.68 Following granting of the DCO, all permits / consents will be agreed with the relevant statutory body prior to construction of the relevant activities. As part of this process, method statements with relevant mitigation management measures will need to be submitted and adhered to.

Decommissioning Phase

10.6.69 Measures will be undertaken during the decommissioning phase to minimise disruption and manage the impacts of the Project.

10.6.70 Decommissioning practices will incorporate measures similar to the construction phase, to prevent pollution and increased flood risk. These measures will include emergency spill response procedures, control of surface water and clean up and remediation of any contaminated soils. Exposed cables ducts will be sealed with an appropriate water proofing material to mitigate flood risk or creation of preferential flow pathways.

10.6.71 An **Outline DEMP (Doc Ref. 7.12)** is submitted with the DCO Application and includes measures to protect the water environment. A detailed DEMP(s) will be developed in line with legislation and guidance that is in place at the time of decommissioning.

10.7 Assessment of Effects

Construction Phase

10.7.1 The assessment of potential effects during the construction phase has been categorised into effects which may result in impacts on flood risk or pollution arising

from the Project. These effects are assessed below under their corresponding heading.

Flood Risk

10.7.2 **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** concludes that the residual flood risks are suitably low and that further mitigation or management (above the embedded mitigation outlined) is not required.

10.7.3 With regards to fluvial flooding, the Site is predominantly located in Flood Zone 1 however parts of the Project fall within areas designated by the EA as Flood Zones 2, 3a and 3b. The high-risk areas are along the East Stour River. In addition to areas along the East Stour River limited areas, primarily along smaller channels, are at elevated risk of surface water flooding.

10.7.4 The Embedded Mitigation which forms part of the Project design incudes measures to minimise the risk of flooding from fluvial and surface water flooding. The Project also includes measures to ensure that the risk of flooding from all sources is not exacerbated. **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** demonstrates that the Project will be safe throughout its lifetime from all sources of flooding.

10.7.5 The following potential effects on the water environment all relate to increased flood risk as a result of the Project during the construction phase:

- Disruption / damage to existing field underdrainage, if present. This could lead to localised groundwater flooding;
- Disruption / blockage of watercourse and floodplain flow from temporary watercourse crossings leading to flooding;
- Changes in flow across the floodplain resulting from stockpiling, temporary access tracks, approaches to temporary watercourse crossings or other temporary ground level changes; and
- Changes in floodplain storage resulting from stockpiling or temporary changes in ground level.

10.7.6 If field underdrainage is encountered, excavations will either be micro-sited or, if this is not achievable, underdrainage would be diverted or replaced. Consequently, construction work should not impact on groundwater flooding as a result of damage to field underdrainage.

10.7.7 The internal haulage road will comprise a permeable surface (such as ground protection mats) and will be laid at existing ground level. The internal haul road will therefore not impact flood flow conveyance or storage.

10.7.8 The **Design Principles (Doc Ref. 7.5)** include buffer zones that will be applied along watercourses within the Site during construction. Within these buffer zones only essential works will be undertaken. All essential works along the main river and ordinary watercourses will be subject to relevant permits and consents. To obtain the necessary permits it will be necessary to demonstrate a negligible impact on channel morphology and flood risk.

10.7.9 Key parameters of temporary watercourse crossings required during the construction phase, as defined by the **Design Principles (Doc Ref. 7.5)**, have been agreed with the EA through consultation.

10.7.10 Primary Construction Compounds and Secondary Construction Compounds are to be sited outside of areas at risk of fluvial flooding, apart from the Secondary Construction Compounds in Fields 19 and 23. The Secondary Construction Compounds in Fields 19 and 23 will not be surfaced and will not be raised, thus it would have a negligible effect on runoff, conveyance and flood storage. The Secondary Construction Compound in Field 23 is within an area at high risk of surface water flooding area together with limited areas of the Primary Construction Compound in Field 25 and the Secondary Construction Compounds in Fields 19 and 20 shown to be a low risk of surface water flooding. Sensitive equipment, such as plant, will not be left overnight in areas of 'high' flood risk and will instead be relocated to higher ground. More generally an EFRP will be in place throughout the construction phase to mitigate flood hazards to equipment and personnel which will, increase precautions when condition mean that risks are elevated and will also include maintaining safe means of egress. In line with the **Outline CEMP (Doc Ref 7.8)** stockpiling and ground level raising will be avoided in floodplain areas which are identified in **ES Volume 4, Appendix 10.2: FRA, Figure 10.2.7 (Doc Ref. 5.4)**.

10.7.11 Based on the assessment of effects, the magnitude of change to flood risk will be negligible. The significance of effect is therefore **Negligible** for all receptors and not significant in EIA terms.

10.7.12 Excluding issues relating to changes in storm water runoff (which are discussed separately below) there are no predicted significant flood risk effects arising from the construction phase at the Site for all assessed and relevant receptors.

Surface Water Runoff

10.7.13 The following potential effects on the water environment all relate to changes in surface runoff as a result of the Project during the construction phase:

- Increased impermeable area leading to high runoff rates and a shorter rainfall-runoff response time;
- Removal of vegetation reducing interception and evapotranspiration rates and increasing runoff;
- Interception of rainfall by panels increasing runoff and reducing interception and evapotranspiration rates;
- Compaction of soils due to use of heavy machinery reducing infiltration, increasing runoff and shortening the rainfall-runoff response and thereby leading to flooding;
- Impermeable underground structure that may disrupt and/or disconnect the hydraulic connectivity of the groundwater in the surrounding area; and
- Disruption to lateral flow (throughflow in soil and runoff) from the placement of aggregate.

10.7.14 Prior to development in any specific area of the Site commencing, the detailed CEMP(s) will include surface water management measures as secured by the **Outline CEMP (Doc Ref. 7.8)**. This will consider the creation of impermeable surfaces within the Primary Construction Compounds and, as appropriate, include further specific control of runoff to greenfield rates whilst providing sufficient pollution mitigation (specifically with regards to sediment laden runoff).

10.7.15 Surface water shed from the construction area will be routed into the SuDS features for attention and filtration of flows prior to release into surface watercourses at greenfield rates. The permanent SuDS will be sized to attenuate a 1 in 100-year event plus a 45% allowance for climate change in line with EA guidance. This will ensure that the flood risk is not increased during the process of construction as a result of an uplift in peak rates of runoff from these areas. Following construction, the SuDS feature will need to be checked and potentially remediated to remove accreted sediment from the construction process.

10.7.16 As a result of the control measures in place, the changes in runoff from the development areas during construction will be small. Whilst the rainfall response time may be shorter due to the introduction of impermeable land use during the construction stage and through the removal of vegetation as interception storage; runoff rates will not exceed existing.

10.7.17 The area proposed for the Project Substation (Field 26) is situated on clay bedrock geology and at present, it is unlikely that much, if any, rainfall is infiltrating to ground. The proposed SuDS features (gravel compound, swale) will be lined so in the event of contaminated runoff, flows do not discharge to ground. A wetland proposed downstream of the firewater shutoff control will however remain unlined. As this is sited in the same clay bedrock infiltration to ground is unlikely and all flows will instead be routed into an adjacent channel. This will mimic the existing regime and therefore will have no impact on the water cycle and / or volume of freshwater available locally.

10.7.18 During extreme rainfall events the low permeability soils on the Site naturally become saturated meaning that the proportion of runoff shed from the Site is high. Construction drainage will seek to slow runoff and will be designed to encourage infiltration of flow to ground where this is possible. Significant infiltration will however likely only be achievable in the small areas of the Site underlain by permeable bedrock.

10.7.19 Significant earthworks across the Site and large vehicular movements may result in soil compaction which can impact soil quality and hydraulic properties to reduce infiltration and throughflow, increasing runoff rates and ultimately flood risk. As discussed in **Paragraph 10.6.42** of this Chapter, the soils across much of the Site have poor permeability and therefore infiltration and throughflow across the majority of the Site is already extremely low. Soil compaction is therefore only really a potentially significant impact in areas where the Hythe Formation or Alluvium is present (refer to **ES Volume 3, Figure 10.6: Bedrock Geology** and **Figure 10.7: Aquifer Characteristics (Doc Ref. 5.3)**) (i.e., Fields 18, 19, 23, 24, 27, 28).

10.7.20 Soil compaction will be minimised throughout the construction phase through embedded mitigation measures included in the **Outline CEMP (Doc Ref. 7.8)**, including the use of permeable ground protection mats or similar for the internal haulage road. Additionally, no major earthworks or ground reprofiling will be undertaken during severe wet or adverse weather conditions to help reduce the likelihood of soil compaction across the Site.

10.7.21 Construction movement by HGVs and plant around the Site will be limited and controlled through implementation of the **Outline CTMP (Doc Ref. 7.9)**. This will include construction of the internal haulage road and access tracks in advance of wider construction works in any given area of the Site. Additional drainage provision or reworking of the soils will be implemented, in accordance with measures included in the **Outline CEMP (Doc Ref 7.8)**, if significant compaction is noted along any of the co-ordinated traffic routes. The potential for increased runoff associated with soil compaction is therefore low.

10.7.22 The internal haulage road will not involve construction work and will comprise ground protection mats which will be laid for vehicles to drive over. The mats are designed as 90% permeable to allow runoff to percolate through the roads to ground. This will minimise alterations to the current flow of surface water. Once work in a given area has been completed, the internal haulage road will be removed and reused elsewhere. Consequently, the internal haulage road and other access tracks required during the construction phase will not significantly disrupt or prevent the lateral or vertical flow of water.

10.7.23 Storm water runoff from areas of construction will be discharged via construction drainage systems into the small ditches and channels around the Site. These then drain towards the East Stour River. The measures and controls discussed will ensure that changes in peak runoff rates, the total volumes of discharge and the timing of runoff are small. The impact on surface water runoff discharging to the East Stour River associated with the construction of the Project will be short term and temporary. Mitigation, management and temporary drainage installed during the construction phase will ensure that the magnitude of change is Negligible. The East Stour River is considered a Medium sensitivity receptor and the significance of effect will also therefore be **Negligible**.

10.7.24 Similarly, any impact along ordinary watercourses, a Low sensitivity receptor, resulting in changes in surface water runoff associated with the construction of the Project will be short term and temporary. The magnitude of change is considered to be Low with small and probably undetectable changes to flood risk. The significance of effect will therefore be **Negligible**.

10.7.25 Groundwater is considered to be a High sensitivity receptor. The magnitude of changes to groundwater patterns and associated with changes to surface runoff (and therefore infiltration) is considered to be negligible. The significance of effect is therefore **Negligible**.

10.7.26 Hatch Park SSSI is a High sensitivity receptor however any impacts with regards to surface runoff are unlikely to have any effect on the SSSI which is only connected

to the Site via regional hydrogeology. The magnitude of effect is therefore Negligible and ultimately the significance of effect is **Negligible**.

10.7.27 Dungeness and Romney Marsh and Rye Bay Ramsar and SPA is a High sensitivity receptor. There should be no adverse impact relating to surface runoff deriving from the construction phase of the Project resulting in a Negligible magnitude of change. The significance of effect is therefore **Negligible**.

10.7.28 There are no predicted significant effects on surface water runoff arising from the activities within the construction phase.

Pollution

10.7.29 The following potential effects on the water environment all relate to pollution occurrence as a result of the Project during the construction phase:

- Pollution from spills or leakage of fuel and oil from use of machinery;
- Release of sediment from excavations into the water environment;
- Increased sediment mobilisation and transport from road material through surface wash off;
- Pollution from spills or leakage of highly alkaline water that has come into contact with cemented materials;
- Direct disturbance to the river channel and bed associated with construction of temporary crossings or stormwater outfalls;
- Breach or surcharge during the process of HDD drilling beneath watercourses; and
- Provision of foul water drainage during construction resulting in increased levels of nitrogen and phosphorus.

10.7.30 During the construction phase, there is the potential for a pollution event or events to affect surface and ground water bodies impacting on their quality. If this occurred this would have a negative impact on the receptor, potentially resulting in degradation of the water quality which would impact on any aquatic life and designated sites with hydrological connectivity to the watercourses and groundwater. The majority of construction works across the Site are set back from watercourses, topography is fairly flat and ground condition are of low permeability. As such, the risks to surface and ground water bodies from pollution events arising from construction activities is generally considered to be low.

10.7.31 Measures for the prevention of pollution incidents are defined within the **Outline CEMP (Doc Ref. 7.8)**. All construction activities will be undertaken in accordance with industry standard practice to minimise the risk of a pollution incident as far as reasonably practicable.

10.7.32 A response plan to pollution incidents will form part of the detailed CEMP(s), which will be implemented at the Site. These will target specific procedures to be in place to minimise the impact to the environment.

10.7.33 Contamination of surface water runoff from machinery, leakage and spills of chemicals from vehicle use and the construction of hardstanding also have the potential to affect surface and ground water bodies. Potential pollutants include sediment, oil, fuels and cement. The embedded pollution control measures surround the handling and storage of fuel and other pollutants, as set out in **Section 10.6** 'Embedded Design Mitigation' and secured through the **Outline CEMP (Doc Ref 7.8)**, will control the majority of pollution risks during the construction phase.

10.7.34 Pollution from mobilised sediment is a major issue on construction sites and can result in increased sedimentation and smothering of habitat as well as morphological impacts. The embedded pollution control measures surround earthworks, vehicle movements, the timing of works, the management of spoil heaps and the implementation of construction drainage, as set out in **Section 10.6** 'Embedded Design Mitigation' of this Chapter and secured through the **Outline CEMP (Doc Ref 7.8)**, will control the majority of pollution risks during the construction phase.

10.7.35 Cementitious materials have alkaline properties which may alter the surface water or groundwater chemistry locally. Any cemented materials that may be used on the Site will be bound by acidic soils and clay / impermeable lining to prevent potentially alkaline water discharging into surface watercourses and groundwaters. This should effectively prevent any leaching of alkaline water.

10.7.36 Physical works at and over channels will be required to create permanent and temporary watercourse crossings and storm water outfalls. Such works have the potential to result in pollution and impact the morphology of the channels; however concept designs have been developed to minimise the extent of such works and avoid any requirement for in channel works. All such works to the river banks will be subject to detailed design and separate approval from the relevant statutory drainage authority. Details of any location specific mitigation required to avoid adverse impacts will be agreed at that stage.

10.7.37 Potential spillages may also occur through the use of drill fluid used for the HDD cabling process. These risks will be managed by regular maintenance and servicing of all equipment and working in alignment with industry standard good practice measures as set out in the **Outline CEMP (Doc Ref 7.8).** Any small spillages within clay bedrock (i.e., along the proposed Cable Route Corridor) are unlikely to have any impact on the Lower Greensand Eastern aquifer as the pollutant would be unable to percolate laterally and vertically through the bedrock. Spillages within the East Stour River (or within the Alluvium aquifer which would be expressed as baseflow) would be significantly diluted by the watercourse and of temporary, short-term nature. These effects would not be permanent and would only be detectable locally until the initial spill has diluted (by which time it will be undetectable) and progressed downstream.

10.7.38 A process is set out in the **ES Volume 4, Appendix 10.3: WFD Assessment (Doc Ref. 5.4)** for developing the final HDD design such that the risk of breach will be very low.

10.7.39 If tankered to a licensed waste water treatment facility in the Stour catchment, foul water could potentially result in elevated levels of nutrients entering the Stodmarsh SAC. As a precautionary measure, the **Outline CEMP (Doc Ref. 7.8)** requires that all foul flows generated from the Site during construction will be collected and removed by tanker to a licensed treatment facility outside of the Stour catchment. As such, there will be no effect on the Stodmarsh SAC designated site.

10.7.40 A pollution incident to the East Stour River, either via chemical spill or sediment laden runoff, would likely be a temporary impact (i.e., following a spillage or extreme heavy rainfall resulting in unmanageable runoff). This is a short-term impact limited to the construction phase and, due to extensive pollution control measures in the **Outline CEMP (Doc Ref. 7.8),** the risk is minimised and would result in a Low magnitude of change. Main rivers are considered a Medium sensitivity receptor and therefore the significance of the effect is assessed to be **Minor Adverse** (not significant).

10.7.41 Similarly, due to minimised risk through applying the **Outline CEMP (Doc Ref. 7.8)** and watercourse set backs, there would be a Low magnitude of change on ordinary watercourses, a receptor of Low sensitivity, resulting in a **Negligible** effect.

10.7.42 Groundwater is considered to be a High sensitivity receptor and the main potential pollution source would be identified from a spillage incident. Any detectable impact would be restricted to areas of the Site where groundwater / permeable geology is present (Secondary A and Principal Aquifers) and would be a direct impact resulting in temporary, short term adverse effects. All construction would be cautiously managed meaning pollution incidents would likely small such that it is reasonable to conclude the baseline groundwater chemistry would not be significantly affected. This therefore means that the magnitude of change would be Negligible on a High sensitive receptor resulting in a **Negligible** significance of effect.

10.7.43 Hatch Park SSSI is only potentially hydrologically connected to the Site via the regional groundwater system and not surface runoff or shallow subsurface flow. Any pollution incidents derived from the Site would be temporary, short term and significantly diluted and undetectable in the event the source pathway reaches the regional groundwater beneath the SSSI. This is considered a Negligible magnitude of change on a High sensitivity receptor (with regards to the water environment) resulting in a **Negligible** significance of effect.

10.7.44 Dungeness Romney Marsh and Rye Bay Ramsar and SPA is considered a High sensitivity receptor but is however located at a significant distance from the Site (6.5km away). In addition, only runoff from the southern half of Field 8 would drain in this direction. Any pollution incidents derived from this part of the Site could potentially connect to Dungeness Romney Marsh and Rye Bay Ramsar and SPA via surface watercourses at which point small volumes of pollutant would be significantly diluted and thus undetectable at the designated site. Any effects would be temporary and short-term having minimal effect on water chemistry at the receptor. The magnitude of impact would be Negligible on a High sensitivity receptor resulting in a **Negligible** significance of effect.

10.7.45 There are no predicted significant effects arising from construction phase pollution incidents at the Site for all assessed and relevant receptors; concluding that impacts from pollution are **Negligible** to **Minor Adverse** (not significant).

Operational Phase

10.7.46 The potential effects during the operational phase of the Project have been categorised into those which may result in impacts on flood risk and impacts to water bodies arising from pollution or changes to surface runoff. These effects are assessed below under their corresponding heading.

Flood Risk

10.7.47 Avoidance of flood risk has been central in the design of the Project as set out in **Section 10.6** 'Embedded Design Mitigation' of this Chapter. As such, all PV panels are located outside of the AFSA and areas where fluvial flooding is predicted to exceed 0.8m under design flood conditions. Inverter Stations are also located outwith the fluvial floodplain and areas of surface water flood risk. Appropriate buffers from watercourses will also be in place (i.e. 8m from the toe of the AFSA embankment, 10m from the East Stour River and IDB managed watercourses) as secured by the **Design Principles (Doc Ref. 7.5).** In addition, while the Sellindge Substation extension is sited within Flood Zone 3, the electrical infrastructure will be raised above maximum potential flood levels and there will be no loss of flood storage.

10.7.48 The residual risk posed to staff on the Site, and also infrastructure, will be managed through an EFRP which will ensure that no people are in high risk areas of the Site during periods when fluvial flooding is likely and that mobile unsecured construction equipment and infrastructure is moved to higher areas of the site where flood risk is low.

10.7.49 The following effects on the water environment relate to changes to flood risk that could potentially arise as a result of the Project during the operational phase:

- Changes in fluvial flood conveyance associated with PV panels and fencing in the floodplain;
- Changes in surface water flood conveyance associated with PV panels in the floodplain; and
- Changes in flood storage both within the AFSA and downstream where development is proposed in the floodplain.

10.7.50 **ES Volume 4, Appendix 10.2: FRA (Doc Ref. 5.4)** provides an assessment of all sources of flood risk and should be referred to for further details. Flood risks associated with changes in surface water runoff are discussed separately below.

10.7.51 The **Design Principles (Doc Ref. 7.5)** establish that PV panels will be raised to a minimum of 0.8m off the ground level (and therefore above the modelled extreme flood levels) so that water can freely pass beneath the structure without damage. All PV panels will be south facing and will therefore not impact flood conveyance.

10.7.52 All new fencing in Fields 19, 23, and 24 (within floodplain downstream of the AFSA) will also be raised at least 0.2m off the ground to minimise the potential to create a barrier to flood flows.

10.7.53 Hydraulic modelling includes scenarios that explicitly represent the impact of the Project of fluvial flood conveyance. This analysis concludes that the scale of potential changes to fluvial flood levels on and away from the Site is negligible.

10.7.54 Away from the floodplain along the East Stour River, PV Arrays are also proposed in some areas where surface water flooding is predicted. Areas of surface water flooding within the Site are typically overland flows derived from the Site itself and away from existing channels and watercourses (within 3.2m of which there will be no infrastructure) only shallow flooding is predicted. Such flow will be able to pass through the frames on which the PV arrays are mounted and there will be a negligible impact.

10.7.55 The Project Substation, including the SuDS required to control storm runoff from this area, is restricted to land that is outside of the floodplain. As such, changes in ground level in this area will have no impact on flood storage.

10.7.56 Where PV panels are located in the floodplain, the frames these are mounted on will result in a small loss of flood storage. Depression storage is proposed on the Site within floodplain areas downstream of the AFSA leading to an increase in floodplain storage of approximately 1,684m^3 within the Site. This will therefore not have an adverse impact on fluvial flood risk. This is secured through the **Outline OSWDS (Doc Ref. 7.14).**

10.7.57 Habitat scrapes / ecological depressions are proposed within the AFSA as part of the **Illustrative Landscape Drawings (Doc Ref. 2.6)**. A wetland area is also proposed within the AFSA, as described in the **Outline OSWDS (Doc Ref. 7.14)**, to provide pollution control for runoff from the Project Substation. These scrapes / depressions will be sized to provide compensatory flood storage capacity for the Project and will increase the available flood storage within the AFSA by approximately 1698m^3 and not adversely impact on flood risk. This is secured through the **Outline OSWDS (Doc Ref. 7.14).**

10.7.58 As such, there will be no adverse impacts arising from the Project in terms of flood risk.

10.7.59 Based on the assessment of effects, the magnitude of change is Negligible. The significance of effect is therefore **Negligible** (not significant) for all receptors.

Surface Water

10.7.60 The following effects on the water environment relate to changes in surface water runoff that could potentially arise as a result of the Project during the operational phase:

- Changes in peak runoff associated with additional hard surfaces;

- Changes in water quality associated with routine runoff from developed parts of the Site;
- Reduction in infiltration; and
- Increase runoff and erosion along drip line of panels.

10.7.61 If not controlled, the introduction of new impermeable surfaces (e.g. Project Substation and Inverter Stations) will give rise to high peak rates and high total volumes of storm water runoff. This in turn can exacerbate flood risk and result in morphological changes within receiving watercourses.

10.7.62 The **Outline OSWDS (Doc Ref. 7.14)** shows how runoff from the Site will be managed during extreme rainfall events. Adequate attenuation and storage will be provided by the Project to avoid uplift in the peak rates of runoff. Flows will discharge via filter drains, swales and wetlands that encourage infiltration and prior to discharge into the local watercourses. These systems have been designed accounting for climate change across the projected lifetime of the Project (i.e. 40 years). As a result, changes in the peak rates and total volumes of storm water runoff from these aspects of the Project will be small.

10.7.63 The introduction of PV panels is generally accepted to have low or neutral impacts on the peak rates and total volumes of storm water runoff as water can infiltrate to the soils been rows. The **Outline OSWDS (Doc Ref. 7.14)** however, sets out how depression storage is being created in areas downgradient of areas where PV panels will be installed to capture runoff from the land and encourage infiltration. These will be free draining to ensure that water flows away, even in winter to make space for repeat storms. As a result, the Project should achieve a small reduction in the peak rates and total volumes of storm water runoff from areas where PV panels are proposed.

10.7.64 If not controlled the introduction of new impermeable surfaces, such as are proposed within the Project Substation, the Inverter Stations and other features such as tracks can result in a deterioration in the water quality of storm runoff. The **Outline OSWDS (Doc Ref. 7.14)** sets out how runoff from the Site will be managed and discharge via filter drains, swales and wetlands that will filter and clean water prior to discharge into the channels around the Site. The **Outline OSWDS (Doc Ref. 7.14)** includes an assessment of the effectiveness of this proposed treatment undertaken using the SuDS Simple Index Method approach as detailed in the SuDS Manual[30]. This demonstrates that for each area of the Site sufficient water quality treatment is being provided. As such, the potential for adverse changes in water quality of storm runoff associated with the Project is low.

10.7.65 Reduction in infiltration will occur on-Site through the introduction of impermeable surfaces. Areas of groundwater recharge on the Site are however likely limited to the Hythe Formation and Alluvial deposits. Elsewhere, infiltration is limited by soil composition which across the majority of the Site comprises clay and loam.

10.7.66 At the Project Substation, Inverter Stations and Sellindge Substation, earthworks will be undertaken to create level development platforms and lining of SuDS features, primarily gravel compounds and the Project Substation swale, will be

undertaken to prevent infiltration for pollution control reasons. Most of these areas are located on land that already has a low permeability and runoff from these areas will be directed into features that encourage infiltration to the ground (wetland area and new ditches). The impact of the Project on groundwater recharge will therefore be small.

10.7.67 Rainfall onto angled PV Arrays in sequence may cause erosion beneath the lower edge of each panel and rainfall runoff forms a drip line between the PV panels and channelises, progressing off-site in line with local topography. This drip line will be subject to erosional processes and may result in potential for slight elevated sediment laden runoff.

10.7.68 The drip line will be planted (refer to **Illustrative Landscape Drawings (Doc Ref. 2.6)**) with species rich grassland to provide interception of rainfall and flow, to encourage infiltration and prevent channelisation of flow. The **Outline OSWDS** (**Doc Ref. 7.14**) details that swales and depression storage will be located in areas downgradient of PV Arrays. These will receive, clean and encourage the infiltration of any small uplift in runoff from the PV panels.

10.7.69 The East Stour River is a Medium sensitivity receptor and the magnitude of change to surface water runoff is considered to be Negligible as there will no discernible change in the rate, quantity and quality of storm water runoff. This is a N**egligible** effect on the East Stour River (not significant).

10.7.70 Ordinary watercourses are a Low sensitivity receptor, and the magnitude of change to surface water runoff is considered to be Low. This is a **Negligible** significance of effect.

10.7.71 Groundwater is a High sensitivity receptor, and the magnitude of change associated surface water runoff (or rather changes in infiltration) is considered to be Negligible. This is a **Negligible** significance of effect.

10.7.72 Hatch Park SSSI is a High sensitivity receptor, and the magnitude of change associated surface water runoff (or rather changes in infiltration) is considered to be Negligible. This is a **Negligible** significance of effect.

10.7.73 Dungeness Romney Marsh and Rye Bay Ramsar and SPA is a High sensitivity receptor and the magnitude of change associated surface water runoff is considered to be Negligible. This is a **Negligible** significance of effect.

10.7.74 Changes in surface runoff associated with the Project on all receptors during the operational phase are considered to be **Negligible** (not significant) effects.

Pollution

10.7.75 The following potential effects on the water environment relate to pollution occurrence as a result of the Project during the operational phase:

- Pollution from spills and leaks of fuel, oil and chemicals from vehicles and maintenance works;

- Sediment mobilisation associated with drip lines or scouring at surface water outfalls;
- Potential for breach of bunding at Inverter Stations and the Project Substations resulting in releases of hazardous chemicals into the water environment; and
- Discharges of water following the unlikely event of a fire.

10.7.76 A comprehensive SuDS network (secured through the **Outline OSWDS (Doc Ref. 7.14)**) will be implemented to help manage both the quantity and quality of flows from the Site. Routine flows from the Site and minor pollution arising from maintenance vehicles will pass through this system and be treated to a high standard.

10.7.77 Maintenance of SuDS features, such as mowing of ponds etc, may potentially result in small spills or leaks which would be well within the filtration/ remediation capacity of the SuDS features as potential chemicals or oils would be similar or equivalent to those which may arise from a vehicle.

10.7.78 Other maintenance works to be undertaken on the Site may involve routine maintenance of the Project Substation, and Inverter Stations. Any spillage could be mobilised during a rainfall event and would discharge into the SuDS features for sufficient filtration. Leaching and the release of hazardous chemicals is considered within the Simple Index Method published in CIRIA C753 guidance[64]. The Simple Index Method compares the pollution hazard indices of a Project with the mitigation offered by specific SuDS features with regards to Total Suspended Solids, Metals and Hydrocarbons. Developments have to demonstrate that the criteria are satisfied by selecting SuDS features which offset the pollution hazard level of the development. On this basis, small amounts of pollutants entering the proposed drainage system is considered as part of the Simple Index Method and will be sufficiently filtered through the SuDS system and therefore should not result in a reduction in quality of the receiving surface waters.

10.7.79 Other design and management measures to prevent pollution from equipment including the Project Substation and Inverter Stations are detailed in the **Outline OSWDS (Doc Ref. 7.14)**, **Outline BSMP (Doc Ref. 7.16)** and **Outline OMP (Doc Ref. 7.11)**. The potential for breach of bunding resulting in the release of hazardous chemicals is therefore very low.

10.7.80 Channelisation of runoff between drip lines of PV panels and at surface water outfalls can result in scour and erosion causing sediment laden runoff. Species rich grassland will be planted around PV Arrays or existing grassland vegetation will be retained. The vegetation will provide interception and evapotranspiration of runoff which is shed from the PV Array which will seek to slow the flow and prevent rapid channelisation. Similarly, vegetation roots will provide stability to the shallow soils preventing erosion and subsequently rapid channelisation along the drip line. In areas where waterlogging is predicted, the **Outline OSWDS (Doc Ref. 7.14)** proposes a number of filter drains which will intercept and filter sediment from runoff prior to discharge into local watercourses.

10.7.81 Scouring at surface water outfalls can occur along the bed and banks of the channel due to the discharge of surface water. As detailed in the **Outline OSWDS (Doc Ref. 7.14),** the proposed approach for discharging stormwater runoff from the Inverter Stations avoids the need for engineering works to the East Stour River and will ensure that the outfall connection to existing waterbodies are naturalised and sympathetic with any hard structures required (pipe outlets) set back from the channel. There will be no outfalls into the East Stour River and where a diffuse option is not considered appropriate (i.e., over access tracks etc), erosion and scour protection measures will be factored into the outfall design.

10.7.82 In the event of a fire at the Project Substation and Inverter Stations, water and foam applied to supress the fire would enter the storm water drainage network. This could then be routed to the ground or surface watercourses. As set out in the **Outline OSWDS (Doc Ref. 7.14)** and **Outline BSMP (Doc Ref. 7.16)**, the detailed design of these areas will prevent infiltration and allow fire water to be held back and retained within the platform area. These plans and the **Outline OMP (Doc Ref 7.11)** set out measures for monitoring and controlling fires and arranging for the removal of contaminated water from the Site by tanker for treatment and disposal.

10.7.83 The potential effect of pollution on the water environment during the operational phase is considered to be short term as it would be limited to the occurrence of the incident itself (i.e., following a spill etc). This may result in an adverse impact on water which is shed from developed areas of the Site. However, this runoff will be filtered by SuDS features having only indirect impacts on the water environment. The magnitude of impact is therefore considered to be negligible for all receptors with only very small changes to the baseline resource. Due to dilution through surface and groundwater courses, the underlying characteristics or quality would remain the same as the baseline.

10.7.84 The East Stour River is considered a Medium sensitivity receptor and the magnitude of change from potential pollution incidents is considered Negligible. The significance of effect is considered **Negligible** (not significant).

10.7.85 Ordinary watercourses are a Low sensitivity receptor and the magnitude of change is considered to be Low. The significance of effect is considered **Negligible** (not significant).

10.7.86 Groundwater is a High sensitivity receptor, and the magnitude of effect is considered to be Negligible due to the large majority of significant works being located away from area of permeable ground. The significance of effect is considered **Negligible** (not significant).

10.7.87 Hatch Park SSSI is considered a High sensitivity receptor with regards to the water environment however the magnitude of impact is considered Negligible because the receptor is remote and the only hydrological connection to the Site is via regional groundwater. The significance of effect is considered **Negligible** (not significant).

10.7.88 Dungeness and Romey Marsh and Rye Bay Ramsar and SPA is considered a High sensitivity receptor however the magnitude of impact is considered Negligible

because the receptor is remote and the only hydrological connection to the Site is via runoff from the southern half of Field 8. The significance of effect is considered **Negligible** (not significant) due to the distance of this designated site.

10.7.89 The pollution effect of the Project on all receptors during the operational phase is considered **Negligible** (not significant).

Decommissioning Phase

10.7.90 Following cessation of energy generation at the Site from the Project, all physical infrastructure constructed as part of the Project (with the exception of elements of Work No. 4 that are within the Sellindge Substation, any repairs, upgrades or replacements of/to the existing bridge / riparian drain crossings, PRoW footbridges and highway improvements) will be removed.

10.7.91 During the decommissioning phase, the impacts on the water environment with regard to flood risk, surface runoff and pollution will be controlled using a similar approach to the construction phase.

10.7.92 An **Outline DEMP (Doc Ref. 7.12)** is provided with the DCO Application and good practice measures (similar to those outlined in the **Outline CEMP (Doc Ref. 7.8)**) will be employed during decommissioning. These measures will be agreed with ABC at the time of decommissioning through a detailed DEMP(s).

10.7.93 Given the implementation of the measures set out in the **Outline DEMP (Doc Ref. 7.8)** the potential effects on the water environment during the decommissioning phase will be the same as already discussed in relation to construction activities. These decommissioning effects are all tabulated in **Table 10.14**.

10.7.94 This assessment concludes that the Project will result in **Minor Adverse** (not significant) effect in the decommissioning phase relating to pollution to the East Stour River. In relation to all other potential effects and receptors this assessment has concluded that decommissioning effects will be **Negligible**.

10.7.95 Other potential effects specific to decommissioning are summarised below:

- Decrease in impermeable area and obstructions to baseline flow pathways leading to changes in pre-development runoff conditions and pre-development rainfall-runoff response time;
- Re-vegetation leading to changes in interception and evapotranspiration rates; and
- Reinstatement of soil profile resulting in changes to infiltration rates and runoff conditions.

10.7.96 The changes above would constitute a return towards baseline conditions for surface runoff and following the period of decommissioning activity there will be less potential for pollution. Surface water runoff receptors have sufficient capacity to receive runoff from the Site at present and therefore the decommissioning works should not exacerbate local flood risks.

10.7.97 On this basis, effects during the decommissioning phase are not significant in EIA terms for all identified receptors.

10.8 Additional Mitigation, Monitoring and Enhancement Measures

Construction Phase

10.8.1 There are no likely significant adverse effects as a result of the Project in the construction phase, therefore no additional mitigation measures are required.

10.8.2 Water quality monitoring will however be undertaken to establish a baseline position prior to the commencement of construction (over both wet winter and dry summer conditions). This will include the East Stour River on-Site and downstream of the Site as well as other smaller channels within the Site.

10.8.3 Details of the sampling regime, including the monitoring suite and sampling frequencies, will be provided in the detailed CEMP(s) and agreed with ABC. Monitoring is secured through the **Outline CEMP (Doc Ref. 7.8)**.

10.8.4 Compliance monitoring will be undertaken throughout the construction phase to establish changes in water quality. Where there are notable detrimental changes to water quality, the relevant procedures for pollution prevention, as defined within the CEMP(s), would be revised to reduce impact. The effects of additional mitigation and their impact will be noticed in routine compliance monitoring.

10.8.5 In some situations, it may be more appropriate to carry out specific impact and mitigation monitoring, such as upstream and downstream of HDD drill points and at water crossings. This will be undertaken on a case-by-case basis.

10.8.6 Due to the level of risk posed by the construction works, this monitoring will consist of visual and olfactory observations plus in-situ testing using handheld water quality meters only.

Operational Phase

10.8.7 Regular inspection and maintenance of the drainage systems will be undertaken throughout the operational phase of the Project. All maintenance and Site works will be carried out in accordance with good practice guidance, with requirements outlined in the **Outline OSDWS (Doc Ref. 7.14)** and **Outline OMP (Doc Ref. 7.11)**.

10.8.8 The drainage system is designed in accordance with current guidance to ensure that the potential for siltation and blockages is minimised under normal operation. If there is evidence of excessive erosion or sedimentation associated with new structures further actions will be considered to remedy that impact in as sustainable a way as possible. This is secured through the **Outline OSDWS (Doc Ref. 7.14)**.

10.8.9 There are no likely significant effects during the operational phase and therefore no requirement for additional mitigation, monitoring or enhancement measures.

Decommissioning Phase

10.8.10 No likely significant adverse effects as a result of the Project are identified in the decommissioning phase, therefore no additional mitigation measures are required.

10.8.11 Water quality monitoring will however be undertaken to establish a baseline position prior to the commencement of decommissioning (over both wet winter and dry summer conditions). This will include the East Stour River on-Site and downstream of the Site as well as other smaller channels within the Site.

10.8.12 Details of the sampling regime, including the monitoring suite and sampling frequencies, will be provided in the detailed DEMP(s) and agreed with ABC. Monitoring is secured through the **Outline DEMP (Doc Ref. 7.12)**.

10.8.13 Compliance monitoring will be undertaken throughout the decommissioning phase to establish changes in water quality. Where there are notable detrimental changes to water quality, the relevant procedures for pollution prevention, as defined within the DEMP(s), would be adjusted appropriately to avoid or minimise impacts.

10.8.14 Due to the level of risk posed by the decommissioning works, monitoring is likely to comprise visual and olfactory observations plus in-situ testing using handheld water quality meters only.

10.9 Residual Effects

Construction Phase

10.9.1 With mitigation in place, no significant residual effects on water environment receptors are predicted during the construction phase of the Project. Projected changes in baseline condition associated with climate change in 2026 would be minimal and will not alter this conclusion.

Operational Phase

10.9.2 With mitigation in place, no significant residual effects on water environment receptors are predicted during the operational phase of the Project.

10.9.3 Projected changes in baseline condition associated with climate change do not alter this conclusion.

Decommissioning Phase

10.9.4 With mitigation in place, no significant residual effects on water environment receptors are predicted during the decommissioning phase of the Project.

10.9.5 Projected changes in baseline condition associated with climate change do not alter this conclusion.

10.10 Cumulative Effects

10.10.1 Cumulative impacts on the water environment are only considered to occur when impacts are non-negligible. Cumulative impacts can also only occur if the impacts are occurring concurrently and to the same receptor.

10.10.2 **ES Volume 4, Appendix 6.1: List of Cumulative Schemes (Doc Ref. 5.4)**. provides the 'Focused Long List' of 'other existing development and/or approved development' to be taken forward to Stage 2 and considered within the cumulative assessment within the ES for the Project. Of these cumulative schemes, the following are considered for assessment in this Chapter, due to being located in the study area or adjacent to water receptors which are potentially impacted by the Project:

- ID No. 3 Pivot Power Battery Storage – This is included due to its proximity to the Site (c. 200m north) and location in the same surface water catchment as the site (i.e. East Stour River);
- ID No. 7 Land north of 1, Church View, Aldington – This is included due to its proximity to the Site (adjacent to the Order limits) and location in the same surface water catchment;
- ID No. 8 Land south west of Goldwell Court, Goldwell Lane, Aldington – This is included due to its proximity to the Site (adjacent to the Order limits) and location in the same surface water catchment;
- ID No. 9 East Stour Solar Farm, Land south of M20, Church Lane, Aldington – This is included due to the scale of development, its proximity to the Site (adjacent to, and overlaps, with Order limits) and because it is situated in the same surface water catchment. This development was refused by ABC in April 2024 although is still considered as a worst case assessment;
- ID No. 10 Otterpool Park Development – This is included due to the scale of development, its proximity to the Site (0.92km east) and because it is situated in the same surface water catchment;
- ID No. 12 Land north of Fairlawn, Blind Lane, Mersham – This is included due to its proximity to the Site (1.3km north west) and because it is located in the same surface water catchment;
- ID No. 13 Land Adjoining The Mount, Barrow Hill, Sellindge – This is included due to its proximity to the Site (2.46km east) and located in the same surface water catchment;
- ID No. 14 Land Rear Rhodes House, Main Road, Sellindge – This is included due to its proximity to the Site (1.5km east), the scale of the development and because it is located in the same surface water catchment; and
- ID No. 15 Land between Peelers and Oakleigh, Church Road, Smeeth – This is included due to its proximity to the Site (1.7km north) and because it is situated in the same surface water catchment.

10.10.3 Other developments within the study area have been screened out. This is either due to the fact that there is no hydrological pathway for them to result in an impact to any of the receptors considered in the assessment, or because of their distance to the Site (and potential for dilution effects) and scale of the development impacts could not realistically be combined to result in a cumulative effect.

Construction Phase

10.10.4 This assessment (reported in **Section 10.7** 'Assessment of Effects') concludes that the Project will result in Minor Adverse (not significant) effects in the construction phase relating to pollution to the East Stour River.

10.10.5 In relation to other potential effects and receptors this assessment has concluded that effects will be Negligible. In relation to these there therefore cannot be a significant cumulative effect.

10.10.6 A short list of cumulative schemes is provided in **Paragraph 10.12.2** of this Chapter. Whilst all schemes are considered as part of this assessment, the potential for minor (or greater) adverse impact typically arises from large schemes such as ID No. 9 East Stour Solar Farm and ID No. 10 Otterpool Park Development. The remaining cumulative schemes are small and thus any impacts likely considered negligible provided they follow industry standard guidance and best practice. They are therefore not considered further.

10.10.7 ID No. 9 East Stour Solar Farm and ID No. 10 Otterpool Park Development schemes both include commitments to managing construction phase impacts on the quality and quantity of runoff from the land. It is however still considered possible that significant cumulative effects on the East Stour River could occur if two or more of these developments are constructed concurrently. The potential cumulative effects include deterioration in water quality as a result of pollutants entering water bodies and changes in drainage characteristic that are not fully mitigated through the implementation of construction drainage.

10.10.8 In order to allow such possible future cumulative impacts to be identified and managed, water quality monitoring is proposed prior to and during construction (as secured by the **Outline CEMP (Doc Ref. 7.8)**.

10.10.9 The baseline monitoring will occur prior to construction and will seek to establish baseline water quality indices. This will extend to cover wet winter and dry summer conditions.

10.10.10 During construction, monitoring will be undertaken so that changes in water quality resulting either from the Project or from other developments cumulatively can be identified. It is reasonable to assume that both ID No. 9 East Stour Solar Farm and ID No. 10 Otterpool Park Development would also be required to undertake regular monitoring as part of CEMPs.

10.10.11 In the event that adverse changes in water quality are identified, the cause would be investigated in coordination with the other development projects and remedial

measures implemented, where appropriate. This is secured by the **Outline CEMP (Doc Ref. 7.8)**.

10.10.12 Subject to the implementation of these additional control measures the cumulative effect on the water quality within the East Stour River would be **Minor Adverse** (not significant).

Operational Phase

10.10.13 This assessment concludes that the Project will result in Negligible (not significant) effects on the water environment in the operational phase. In relation to this there therefore cannot be a significant cumulative effect.

Decommissioning Phase

10.10.14 This assessment concludes that the Project will result in Minor Adverse (not significant) effects in the decommissioning phase relating to pollution to the East Stour River. If other major works were to occur nearby during the period of decommissioning this Minor Adverse effect could contribute to a significant adverse effect. Cumulative effects could also arise due to the operational effects of other developments acting in combination with those of the Project decommissioning activities.

10.10.15 Water quality monitoring is proposed prior to and during the decommissioning phase (as secured by the **Outline DEMP (Doc Ref. 7.12)**) to allow such impacts to be identified and appropriately managed.

10.10.16 Water quality monitoring would be undertaken prior to decommissioning to establish baseline water quality indices during winter (wet) and summer (dry) conditions. Monitoring will also be undertaken during decommissioning so that any changes in water quality resulting from the Project, or other developments acting in combination with the Project, can be identified.

10.10.17 In the event that adverse changes in water quality are identified, the causes would be investigated in coordination with the other projects and remedial measures implemented, where appropriate. This is secured by the **Outline DEMP (Doc Ref. 7.12)**.

10.10.18 Subject to the implementation of these additional control measures the cumulative effect on the water quality of the East Stour River would be **Minor Adverse** (not significant).

10.10.19 In relation to other potential effects and receptors, the assessment concludes that effects will be Negligible and no cumulative effects are identified.

Mitigation, Monitoring and Residual Effects

10.10.20 There are no predicted significant cumulative effects and therefore additional mitigation or monitoring beyond that discussed is not required. No significant residual cumulative effects are identified.

10.11 Summary

10.11.1 The layout of the Project, **Design Principles (Doc Ref. 7.5)** and relevant management plans have been developed to avoid adverse effects on the water environment. With mitigation in place, including adherence to phase specific management plans, the assessment concludes that the Project is not likely to give rise to significant effects during construction, operation or decommissioning.

10.11.2 **Table 10.14** of this Chapter provides a summary of the water environment assessment and residual effects.

Table 10.14: Summary of Residual Effects

Receptor	Description of Impact**	Significance of Effect without additional mitigation	Additional Mitigation/ Enhancement measure	Residual effect after mitigation
Construction Phase				
All Receptors	Increased flood risk	Negligible	N/A	Negligible
East Stour River	Change in Surface Water Runoff	Negligible	N/A	Negligible
Ordinary Watercourses		Negligible	N/A	Negligible
Groundwater		Negligible	N/A	Negligible
Hatch Park SSSI		Negligible	N/A	Negligible
Dungeness and Romney Marsh and Rye Bay Ramsar and SPA		Negligible	N/A	Negligible
East Stour River	Pollution	Minor Adverse (not significant)	N/A	Minor Adverse (not significant)
Ordinary Watercourses		Negligible	N/A	Negligible
Groundwater		Negligible	N/A	Negligible

Receptor	Description of Impact**	Significance of Effect without additional mitigation	Additional Mitigation/ Enhancement measure	Residual effect after mitigation
Hatch Park SSSI		Negligible	N/A	Negligible
Dungeness and Romney Marsh and Rye Bay Ramsar and SPA		Negligible	N/A	Negligible
Operational Phase				
All Receptors	Increased flood risk	Negligible	N/A	Negligible
East Stour River	Change in surface water runoff	Negligible	N/A	Negligible
Ordinary Watercourses		Negligible	N/A	Negligible
Groundwater		Negligible	N/A	Negligible
Hatch Park SSSI		Negligible	N/A	Negligible
Dungeness and Romney Marsh and Rye Bay Ramsar and SPA		Negligible	N/A	Negligible
East Stour River	Pollution	Negligible	N/A	Negligible
Ordinary Watercourses		Negligible	N/A	Negligible

Receptor	Description of Impact**	Significance of Effect without additional mitigation	Additional Mitigation/ Enhancement measure	Residual effect after mitigation
Groundwater		Negligible	N/A	Negligible
Hatch Park SSSI		Negligible	N/A	Negligible
Dungeness and Romney Marsh and Rye Bay Ramsar and SPA		Negligible	N/A	Negligible
Decomissioning Phase				
All Receptors	Increased flood risk	Negligible	N/A	Negligible
East Stour River	Change in surface water runoff	Negligible	N/A	Negligible
Ordinary Watercourses		Negligible	N/A	Negligible
Groundwater		Negligible	N/A	Negligible
Hatch Park SSSI		Negligible	N/A	Negligible
Dungeness, Romney Marsh and Rye Bay Ramsar and SPA		Negligible	N/A	Negligible
East Stour River	Pollution	Minor Adverse (not significant)	N/A	Minor Adverse (not significant)

Receptor	Description of Impact**	Significance of Effect without additional mitigation	Additional Mitigation/ Enhancement measure	Residual effect after mitigation
Ordinary Watercourses		Negligible	N/A	Negligible
Groundwater		Negligible	N/A	Negligible
Hatch Park SSSI		Negligible	N/A	Negligible
Dungeness, Romney Marsh and Rye Bay Ramsar and SPA		Negligible	N/A	Negligible

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