# Stonestreet Green Solar

## Environmental Statement
## Volume 2: Main Text
## Chapter 11: Land Contamination

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APFP Regulation 5(2)(a)
Planning Act 2008
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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# 11 Land Contamination

## 11.1 Introduction

11.1.1 This Chapter of the ES has been prepared on behalf of EPL 001 Limited ('the Applicant') to report on the assessment of the likely significant effects with regards to land and groundwater quality in relation to the Development Consent Order ('DCO') application for Stonestreet Green Solar ('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.

11.1.2 Detailed descriptions of the Site, the Project and the different phases of development are provided in **ES Volume 2, Chapter 2: Site and Context 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)**.

11.1.3 The Chapter is supported by the following figures and appendices:

### ES Volume 3 - Figures (Doc Ref. 5.3)

- Figure 11.1: Ground Investigation Location Plan;
- Figure 11.2: Landfill and Waste Management Plan;
- Figure 11.3: Environmental Designations Location Plan; and
- Figure 11.4: Unexploded Ordnance Hazard Location Plan.

### ES Volume 4 – Appendices (Doc Ref. 5.4)

- Appendix 11.1: Legislation, Policy and Guidance;
- Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study;
- Appendix 11.3: Ground Investigation Report; and
- Appendix 11.4: Revised Conceptual Site Model.

## 11.2 Legislation, Planning Policy and Guidance

### Legislation

11.2.1 The following legislation is relevant to the Project:

- Control of Pollution Act 1974[1];
- Environmental Protection Act 1990[2] ('EPA');
- Pollution Prevention and Control Act 1999[3];
- Contaminated Land (England) Regulations 2006[4];
- Environmental Damage (Prevention and Remediation) (England) Regulations 2015[5];

- Environmental Permitting (England and Wales) Regulations 2016[6];
- Health and Safety at Work etc Act 1974[7];
- Water Resources Act 1991[8];
- Environment Act 1995[9];
- Environment Act 2021[10];
- Nitrate Pollution Prevention Regulations 2015[11];
- Management of Health and Safety at Works Regulations 1999[12];
- Control of Substances Hazardous to Health Regulations 2002[13];
- Control of Asbestos Regulations 2012[14];
- Construction (Design and Management) Regulations 2015[15] ('CDM');
- Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[16]; and
- Water Supply (Water Quality) Regulations 2018[17].

11.2.2 A summary of the relevant legislation for this assessment is provided in **ES Volume 4, Appendix 11.1: Legislation, Policy and Guidance (Doc Ref. 5.4)**.

### Planning Policy

- Overarching National Policy Statement ('NPS') for Energy (EN-1) (2023)[18];
- NPS for Renewable Energy Infrastructure (EN-3) (2023)[19];
- NPS for Electricity Networks Infrastructure (EN-5) (2023)[20];
- National Planning Policy Framework (2023)[21]; and
- Ashford Local Plan 2030[22].

11.2.3 A summary of the relevant national and local policy for this assessment is provided in **ES Volume 4, Appendix 11.1: Legislation, Policy and Guidance (Doc Ref. 5.4)**.

### Guidance

11.2.4 The following guidance and other sources of information are relevant to the Project:

- Environmental Protection Act 1990: Part IIA Contaminated Land Statutory Guidance (DEFRA, 2012)[23];
- Land affected by contamination webpage[24];
- CIRIA C552 Contaminated Land Risk Assessment: A Guide to Good Practice 2001[25];
- Guidelines for Environmental Risk Assessment and Management – Green Leaves III 2011[26];
- Land Contamination Risk Management 2023[27] ('LCRM');
- Groundwater Protection Technical Guidance 2017[28];
- Guiding Principles for Land Contamination[29];

- British Standard ('BS') 5930:2015+A1:2020 The Code of Practice for Site Investigations 2020[30];
- BS 10175: 2011+A2:2017 Investigation of Potentially Contaminated Sites – Code of Practice[31];
- Land Affected by Contamination[32];
- Normal Background Concentrations ('NBCs') of Contaminants in English and Welsh Soils[33];
- National Quality Mark Scheme for Land Contamination Management[34];
- The Environment Agency's Approach to Groundwater Protection[35];
- CIRIA C665 Assessing Risks Posed by Hazardous Ground Gases to Buildings[36] ('C665');
- CIRIA C735 Good Practice on the Testing and Verification of Protection ('C735')[37];
- BS 8485:2015+A1:2019. Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for the New Buildings[38];
- Building Research Establishment ('BRE') 211 Radon: Guidance on protective measures for new buildings[39];
- British Geological Survey: BGS GeoIndex Interactive Portal[40];
- LQM/CIEH S4UL's for Human Health Risk Assessment[41];
- DEFRA Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination[42];
- BRE Special Digest 1: Concrete in aggressive ground[43];
- UK Health Security Agency: UK Maps of Radon[44];
- British Geological Survey: BGS BritPits[45]; and
- EA Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention[46].

11.2.5 A summary of the relevant guidance and other sources of information for this assessment is provided in **ES Volume 4, Appendix 11.1: Legislation, Policy and Guidance (Doc Ref. 5.4)**.

## 11.3 Stakeholder Engagement

11.3.1 This section of the Chapter summarises key stakeholder engagement undertaken to inform the assessment. It sets out the key matters raised by consultees in relation to the EIA on the topic of land and groundwater quality. An explanation of how comments are addressed in the ES is provided.

### EIA Scoping

11.3.2 **Table 11.1** provides a summary of the responses to the EIA Scoping Report (**ES Volume 4, Appendix 1.1: EIA Scoping Report (Doc Ref. 5.4)**) of relevance to this assessment and how the assessment has responded to them.

Table 11.1: EIA Scoping Response Summary

| Consultee and Comment | Response |
|---|---|
| *Planning Inspectorate (30 May 2022)* | |
| *'The Inspectorate notes that the summary provided in the executive summary at Appendix 2, which states that there is a low-moderate risk of contamination (from potential pollutants on the site including metals, sulphates, cyanides, petroleum hydrocarbons, chlorinated hydrocarbons, phenols, polychlorinated biphenyls ('PCBs'), polycyclic aromatic hydrocarbons ('PAHs'), pesticides, herbicides and asbestos) contradicts the conclusion provided in section 10 which states that there is a very low-low risk of contamination at the site.'* | The Phase 1 Geoenvironmental and Geotechnical Desk Study (which was included as Appendix 2 within the Scoping Report (**see ES Volume 4, Appendix 1.1 (Doc Ref. 5.4)**) has been updated (see **ES Volume 4, Appendix 11.2 Phase 1 Geoenvironmental and Geotechnical Desk Study (Doc Ref. 5.4**)).<br><br>It concludes that there is a Very Low to Low risk classification for potential contamination at the Site. |
| *'Paragraph 10.7 of Appendix 2 states that the extent and depth of Made Ground should be ascertained and that a ground investigation would assist in reducing existing uncertainties and inform foundation requirements.'* | A phase of intrusive ground investigation works was carried out targeting areas of suspected Made Ground to characterise the extent and depth of the Made Ground and the level of contaminative risk associated with the Site. The findings of these works are provided in **ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref. 5.4)**. |
| *Table 9.1 identifies that there is a low to moderate risk at the Proposed Development site associated with ground stability.* | Groundsure data dated April 2024 is included in **ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study, Annex B (Doc Ref 5.4)**. The Groundsure data includes BGS 1:50,000 scale landslip mapping records which shows that 98.8% of the Site is rated as 'Very Low' risk meaning that instability problems are not likely to occur.<br><br>Of the remaining 1.2%, less than 0.7% of the total Site area, approximately 1.36ha in size within Field 12/13, is at 'moderate' risk for Landslide Deposits (i.e., ground stability). A moderate risk means that instability problems are probably present or have occurred in the past and that land use should consider specifically the stability of the site. Development in this |

| Consultee and Comment | Response |
|---|---|
| | area only includes PV Panels and landscaping works with no excavation activities proposed.<br><br>The remaining 0.5% of the Site is at 'low' risk, within Fields 5/6 and 13, meaning that instability problems may be present or anticipated. |
| *'…the Inspectorate considers that contamination issues on a predominantly greenfield site are unlikely to be significant. However, there are a number of unresolved and uncertain matters identified in the scoping material and on this basis the Inspectorate considers that a land contamination chapter prepared in accordance with relevant Environment Agency guidelines should be included in the ES. The chapter should explain how relevant mitigation measures would be secured via the DCO.'* | This Chapter has been prepared in accordance with relevant Environment Agency guidelines. It sets out the relevant mitigation measures and explains how these are secured via the DCO. |
| *ABC EIA Scoping Response (18 May 2022)* | |
| *'A watching brief must be maintained during construction and decommissioning works and reported to ABC Environmental Protection Team before works continue.'* | A watching brief for unanticipated ground conditions will be maintained during construction and decommissioning works. The watching brief protocol is set out within the **Outline Construction Environmental Management Plan ('CEMP') (Doc Ref. 7.8)** and **Outline Decommissioning Environmental Management Plan ('DEMP') (Doc Ref. 7.12)**. |
| *Environment Agency EIA Scoping Response (26 May 2022)* | |
| *'This site partly overlies a chalk aquifer and Secondary A aquifer. Any pathways for contamination must be strictly controlled to avoid pollution of the principal and secondary aquifers from any historic contamination identified on the site from any previous uses, including historic landfilling.*<br><br>*It is recommended that the requirements of the National Planning Policy Framework (NPPF) are followed.* | Potentially complete pollutant pathways, including those affecting controlled water receptors, have been considered a part of the risk assessment undertaken within the **ES Volume 4, Appendix 11.2: Phase 1 Geoenvironmental and Geotechnical Desk Study** (**Doc Ref. 5.4)** and this is summarised within **ES Volume 4, Appendix 11.4: Revised Conceptual Site Model (Doc Ref. 5.4)**. The assessment assesses the risk to ground |

| Consultee and Comment | Response |
|---|---|
| *Paragraph 174 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from or being adversely affected by unacceptable levels water pollution. Therefore, in completing any risk assessments the applicant should assess the risk to groundwater and surface waters from contamination which may be present and where necessary propose appropriate remediation.'* | water and surface waters which may be present and considers in both cases the risk is Very Low to Low. No remediation is therefore considered necessary. |
| *'In making our response we have considered issues relating to controlled waters The evaluation of any risks to human health arising from the site should be discussed with the Environmental Health Department.*<br><br>*We recommend that the applicant:*<br>▪ *Refers to the Environment Agency Land Contamination: Risk Management guidance, which is based on the Model Procedures for the Management of Land Contamination (CLR 11);*<br>▪ *Uses BS 10175:2011 A2:2017, BS 10175 2001, Investigation of potentially contaminated sites – Code of Practice as a guide to undertaking the desk study and site investigation scheme;*<br>▪ *Uses MCERTS accredited methods for testing contaminated soils at the site; and*<br>▪ *Consult our website at www.environment-agency.gov.uk for further information about any permissions that may be required.*<br><br>*The scope of the proposed EIA is acceptable in principle in that it outlines key issues of concern at this site.'* | A phase of ground investigation works was undertaken following a preliminary risk assessment to human health receptors and was progressed in line with the guidance outlined by the Environment Agency. This guidance was followed throughout the process of designing and undertaking site investigation works and a fully accredited laboratory was commissioned for the geochemical testing. The findings of the ground investigation are provided in **ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref. 5.4**). A revised conceptual model and risk assessment is presented in **ES Volume 4, Appendix 11.4: Revised Conceptual Site Model (Doc Ref. 5.4)**. This revised conceptual site model is based upon the initial conceptual site model presented in the **ES Volume 4, Appendix 11.2: Phase 1 Geoenvironmental and Geotechnical Desk Study** (**Doc Ref. 5.4)** and has been revised using the results and findings of the intrusive ground investigation works provided in **ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref. 5.4)**. The **ES Volume 4, Appendix 11.4: Revised Conceptual Site Model (Doc Ref. 5.4)** was used to inform the assessment provided within this ES Chapter. |

| Consultee and Comment | Response |
|---|---|
| | |
| *Natural England EIA Scoping Response (18 May 2022)* | |
| *'For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination'* | The vast majority of the Site is not previously development land. The risk posed by land contamination associated with the Site and potential contamination associated with the Project is included in the scope of this Chapter. The assessment of risk posed by land contamination, detailed in **Section 11.8** of this Chapter, is based in-part on the Phase 1 Geoenvironmental and Geotechnical Desk Study (see **ES Volume 4, Appendix 11.2 (Doc Ref. 5.4)**) which concluded that there is a Very Low to Low risk to sensitive receptors posed by contamination that is potentially present across the Site. |

### Non-Statutory Consultation

11.3.3 **Table 11.2** provides a summary of responses to non-statutory consultation that was undertaken of relevance to this assessment and how the assessment has responded to this.

Table 11.2: Non-Statutory Consultation Response Summary

| Consultee and Comment | Response |
|---|---|
| *Community Feedback S47/48 Response* | |
| *'Will the concrete, cables or any other part of the project cause contaminate the land? If so, how is land contamination impacts being addressed?'* | The **Outline CEMP (Doc Ref. 7.8)** specifies how construction phase activities will mitigate effects on the environment and surrounding area. It provides protocols for appropriate working measures in accordance with current good practice, and therefore avoidance of pollution or contamination in the construction phase. |

### 2022 Statutory Consultation

11.3.4 **Table 11.3** provides a summary of the responses to the consultation on the PIER of relevance to this assessment and how the assessment has responded to them.

Table 11.3: 2022 Statutory Consultation Response Summary

| Consultee and Comment | Response |
|---|---|
| *Environmental Agency (28 November 2022)* | |
| Groundwater and Contaminated Land<br>*'We have reviewed the PEIR document sections related to the water environment (groundwater) and land contamination. The PEIR has established baseline conditions and made an assessment of the likely impact of this proposal (during construction, operation, and beyond) on these baseline conditions, and where potential impacts have been identified, then mitigation measures have been proposed'.* | Noted |
| Land Contamination<br>*'The proposal area is mostly greenfield/agricultural land. Based on the information provided in the PEIR, including the Phase 1 report and conceptual site model, it is concluded that a number of potential contaminant linkages are present, although risk to groundwaters is low. A number of mitigation measures are proposed, and we are satisfied they would be suitably protective of groundwater. We do not object in principle to the content and conclusions of the PEIR section on land contamination in relation to the protection of groundwater quality'.* | Noted. |
| *ABC (Environmental Protection Unit) (30 November 2022)* | |
| *'Phase 1 investigation (Groundsure) and site walkover draft of the preliminary conceptual site model have identified a* | A watching brief for unanticipated ground conditions will be maintained during construction and decommissioning |

| Consultee and Comment | Response |
|---|---|
| *low potential for land contamination for the current site and effects from construction, operation and decommissioning of the proposed development.*<br><br>*A watching brief must be maintained during construction and decommissioning works and reported to ABC Environmental Health before works continue.'.* | works. The watching brief protocol is set out within the **Outline CEMP (Doc Ref. 7.8)** and **Outline Decommissioning Environmental Management Plan ('DEMP') (Doc Ref. 7.12)**. |

### 2023 Statutory Consultation

11.3.5 **Table 11.4** provides a summary of the responses to the consultation on the PEIR Addendum of relevance to this assessment and how the assessment has responded to them.

Table 11.2: 2023 Statutory Consultation Response Summary

| Consultee and Comment | Response |
|---|---|
| *Environmental Agency Response (20 July 2023)* | |
| '*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'*. | Noted. |

### 2023 and 2024 Targeted Consultation

11.3.6 No comments of relevance to the assessment of land contamination were raised in response to the 2023 or 2024 Targeted Consultations.

## 11.4 Assessment Methodology

### Assessment Scope

11.4.1 An assessment was made of the potential ground and groundwater contamination issues associated with the Project for both receptors within and in the vicinity of the Site during its construction, operational and decommissioning phases.

11.4.2 'Contaminated land' is defined by section 78A of the EPA as:

*'…any land which appears to the local authority in whose area it is situated to be in such condition, by reason of substances in, on or under the land, that - (a) significant harm is being caused or there is a significant possibility of such harm*

*being caused; or (b) significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused'.*

11.4.3 Under Part IIA of the EPA, for a relevant risk to exist, there needs to be one or more contaminant-pathway-receptor linkages. The assessment of contamination uses a risk-based approach on a contaminant linkage being present. This 'complete linkage' requires the presence of:

- A source of contamination;
- A pathway for contaminant source to move to the receptor; and
- A receptor affected by the contaminant, such as human health, controlled waters, ecology, or the built environment.

11.4.4 The assessment methodology defines the baseline conditions as the potential sources, pathways and receptors present and then considers how these may affect future receptors during the construction, operational and decommissioning phases, including consideration of changes to the Conceptual Site Model ('CSM'). These changes may include the introduction of new pathways, alterations to receptor type and sensitivity.

11.4.5 The method of baseline data collection and assessment was undertaken following a tiered approach to risk assessment as recommended within the Environment Agency's LCRM guidance that outlines the following:

- Preliminary risk assessment: an assessment of historical and published information in order to develop an initial conceptual site model and preliminary risk assessment;
- Generic quantitative risk assessment: an assessment of site-specific data using generic assessment criteria to screen the site and establish whether there are potential risks; and
- Detailed quantitative risk assessment: an assessment involving the generation of site-specific assessment criteria.

11.4.6 This tiered approach involves identification and investigation of potential contamination sources, pathway and receptors and the Project, and refinement of the CSM to ultimately identify potential mitigation requirements.

11.4.7 The CSM and risk assessment used for this Chapter was refined and revised from its initial stage, as detailed in **ES Volume 4, Appendix 11.2**: **Phase 1 Geoenvironmental and Geotechnical Desk Study (Doc Ref. 5.4**) by the collection and assessment of site-specific data, as detailed in **ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref. 5.4)**.

11.4.8 The final CSM and quantitative risk assessment that was used to inform this Chapter is presented in **ES Volume 4, Appendix 11.4: Revised Conceptual Site Model (Doc Ref. 5.4)**.

## Matters Scoped In

11.4.9 The following potential effects are considered likely to be significant and are included within this Chapter for assessment:

### *Construction Phase*

- Human health relating to the potential exposure to contamination associated with current and / or historical land uses;
- Controlled water pollution from the leaching and off-site migration of contamination associated with current and / or historical land uses;
- Ground gas generation, migration and accumulation in confined spaces;
- Unexploded ordnance ('UXO'); and
- Contamination of land and controlled waters during the construction phase.

### *Operational Phase*

- Human health relating to the potential exposure to contamination associated with current and / or historical land uses;
- Controlled water pollution from the leaching and off-site migration of contamination associated with current and / or historical land uses;
- Ground gas generation, migration and accumulation in confined spaces;
- Contamination of land and controlled waters during the operational phase; and
- Contamination of land and controlled waters during the operational phase.

### *Decommissioning Phase*

- Human health relating to the potential exposure to contamination associated with current and / or historical land uses;
- Controlled waters pollution from the leaching and off-site migration of contamination associated with current and / or historical land uses;
- Ground gas generation, migration and accumulation in confined spaces;
- UXO; and
- Contamination of land and controlled waters during the decommissioning phase.

## Matters Scoped Out

### *Mineral Resources*

11.4.10 The effect of land contamination associated with historical activities across the Site and / or the construction / operational phase / decommissioning of the Project on potential mineral resources at the Site was not considered within the scope of this assessment. A summary of potential effects on minerals is provided in **ES Volume 2, Chapter 16: Other Topics, Section 16.4 (Doc Ref. 5.2)**.

### *Controlled Water*

11.4.11 The effect of the Project on controlled water was assessed in relation to contamination only and other issues including flood risk are outside the scope of this

assessment and are included in **ES Volume 2, Chapter 10: Water Environment (Doc. Ref. 5.2)**.

### Study Area

11.4.12 A study area of up to 250m as shown in **ES Volume 3, Figure 11.1: Ground Investigation Location Plan (Doc Ref. 5.3)** surrounding the Site was defined using environmental data and historical, hydrogeological, geological and environmental mapping to identify potential contamination sources and receptors.

### Establishing Baseline Conditions

#### Phase I Geo-environmental Desk Study

11.4.13 Sources of information that were consulted and reviewed to establish the existing baseline conditions include:

- Environmental search data and historical, hydrogeological, geological and environmental mapping for the study area provided by Groundsure Ltd, dated 25 April 2024. Included within **ES Volume 4, Appendix 11.2: Phase 1 Geoenvironmental and Geotechnical Desk Study, Annex B (Doc Ref. 5.4)**;
- Unexploded Ordnance Desk Study and Risk Assessment (ref. P11544-23-R3) prepared by Zetica dated 25 January 2024. Included within **ES Volume 4, Appendix 11.2: Phase 1 Geoenvironmental and Geotechnical Desk Study, Annex E (Doc Ref. 5.4)**;
- Published geological mapping for the Site, hosted electronically on the British Geological Survey ('BGS') GeoIndex portal, accessed in August 2023;
- A review of nearby borehole records on the BGS GeoIndex portal, accessed in August 2023;
- BRE 211: Radon, accessed in August 2023;
- A review of publicly accessible aerial and street view photography across the Site, accessed in August 2023; and
- Internet based searches regarding Site and local history, accessed in August 2023.

11.4.14 An initial review of the above listed sources of information was undertaken, with Site walkover surveys between 29 November and 1 December 2021 across the Site, and on 4 January 2023 across the Cable Route Corridor to ground-truth the data. A supplementary site walkover survey was undertaken between 29 February and 1 March 2024 in order to validate the findings of the ES chapter.

11.4.15 The supplementary site walkover confirmed no significant changes to observable ground conditions, or previously undocumented, potentially contaminative processes were identified. Therefore the assessments provided within this ES Chapter and its appendices are considered accurate.

11.4.16 A **Phase I Geoenvironmental and Geotechnical Desk Study** report (**ES Volume 4, Appendix 11.2 (Doc Ref. 5.4)**) was produced detailing the findings of the data

review and Site walkover surveys and established the geological conditions beneath the Site and identified areas of potentially contaminated land and land instability.

11.4.17 The **Phase I Geoenvironmental and Geotechnical Desk Study** report (**ES Volume 4, Appendix 11.2 (Doc Ref. 5.4)**) presents an initial CSM (excluding any ground investigation results) and preliminary qualitative risk assessment of the potential hazards related to contaminated land and its effects on identified human health, controlled water, ecosystem and built environment receptors. The conclusion of this Phase I Study was that the risk of contamination was judged to be very low to low, see **Section 11.6** for further details.

11.4.18 The recommendations of the **Phase I Geoenvironmental and Geotechnical Desk Study** report (**ES Volume 4, Appendix 11.2 (Doc Ref. 5.4)**) included undertaking an intrusive ground investigation. The ground investigation works were to reduce existing uncertainties regarding the presence and extent of any Made Ground materials across the Site and provide Site-specific data to refine the CSM and provide a generic quantitative risk assessment. This is discussed further below.

### Phase II Intrusive Ground Investigation Works

11.4.19 An intrusive ground investigation was undertaken at the Site between the 15 and 17 February 2023. The aim of the ground investigation was to confirm the ground conditions across the wider Site, in particular, the presence and extent of Made Ground. The ground investigation was focused on areas across the Site identified in the desk study as potential sources of contamination.

11.4.20 The intrusive ground investigation works comprised the following works:

- Five machine-dug trial pits excavated to a maximum depth of 2.3m below ground level ('bgl');
- 11 windowless sampler boreholes drilled to a maximum depth of 5m bgl;
- Collection of 32 soil samples for laboratory testing; and
- One follow-up round of environmental (ground gas and groundwater) monitoring.

11.4.21 A total of 32 soil samples were subject to chemical analysis for the following determinants:

- Heavy metals;
- Total Organic Carbon;
- Soil Organic Matter;
- Water soluble sulphate;
- Speciated Polycyclic Aromatic Hydrocarbons;
- Total Petroleum Hydrocarbons; and
- Asbestos identification.

11.4.22 **ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref. 5.4)** provides the findings of the ground investigation, together with the chemical analysis of collected soil samples and the results of the environmental monitoring used to inform the revised conceptual site model and quantitative environmental risk assessment presented in **ES Volume 4, Appendix 11.4: Revised Conceptual Site Model (Doc Ref. 5.4)** and provides additional commentary of the geotechnical suitability of the ground. The results from the Ground Investigation Report confirmed the risk level from contamination to identified sensitive receptors is very low to low, see **Section 11.6** for further details.

## Identifying Likely Significant Effects

### Construction, Operational and Decommissioning Effects

11.4.23 The identification of likely significant effects was initially undertaken as part of the creation and refinement of the CSM and risk assessment presented in **ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study Report (Doc Ref. 5.2)** and **ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref. 5.2)**. The process involved the following stages:

- Identification of the land contamination baseline conditions;
- Identification of potentially complete pollutant linkages between receptors and potentially contaminative sources that may already be present across the Site due to historical activities and / or potentially contaminative activities associated with the Project;
- Determination of each receptor's sensitivity;
- Determination of potential magnitude of impact on a receptor;
- Evaluation of the significance of the effect based upon its magnitude, and the affected receptor sensitivity, and if effect is considered to be significant;
- Detail any additional mitigation measures that may be required during the Project; and
- Assessment of the significance of any residual impacts.

11.4.24 This approach was applied for the construction, operational and decommissioning phases of the Project. The time periods of the Project phases of which the potential effects were assessed against are as follows:

- The construction phase of the Project is expected to commence in 2026 and has an expected build period of 12 months to complete;
- The operational lifespan of the Project is expected to be 40 years to 2067; and
- The decommissioning phase of the Project is expected to take 12 months to 2068.

## Cumulative Effects

11.4.25 This Chapter assessed the inter-scheme cumulative effects on each identified receptor within a designated 250m radius Zone of Influence ('ZoI') surrounding the Site.

11.4.26 The potential for interaction of construction / operational phase / decommissioning effects from the Project with other schemes set out **ES Volume 4: Appendix 6.1: List of Cumulative Schemes (Doc Ref. 5.4)** within 250m of the Site were considered. The Focused Long List schemes were reviewed and schemes with the potential for spatial or temporal overlap in effects were identified, e.g., overlapping ZoIs, identification of common receptors/ receptor groups and the predicted scheme timelines. From the Focused Long List, the following cumulative schemes were considered for further assessment in the cumulative effects assessment:

- ID No. 3: Pivot Power Battery Storage;
- ID No. 4: Walsh Power Condenser Project; and
- ID No. 9: East Stour Solar Farm.

11.4.27 The following Focused Long List schemes with overlapping ZoI were not considered for further assessment for the following reasons:

- Agricultural Barn, Bank Road (Cumulative scheme ID. 1), planning reference 21/02049/AS. The scheme constitutes a change of use, with storage units to be housed within an existing shed, therefore minimal groundworks are expected and there is a low risk of completed pollution pathways related to the proposed development;
- Goldwell Farm, Goldwell Lane (Cumulative scheme ID. 2), planning reference PA/2022/2607. The scheme comprises the demolition of an existing structure and construction of a single building therefore the potential for cumulative effects is considered to be negligible;
- Land north of 1 Church View (Cumulative scheme ID. 7), planning reference 19/00895/AS. The scheme comprises the construction of 6 dwellings and associated infrastructure. The potential for cumulative effects with the Project is considered to be low due to the small-scale nature of the scheme; and
- Land southwest of Goldwell Court, Goldwell Lane (Cumulative scheme ID. 8), planning reference 20/00652/AS. The scheme comprises the erection of 11 dwellings and associated infrastructure, and the provision of open space. The potential for cumulative effects with the Project is considered to be low due to the small-scale nature of the scheme.

## Determining Effect Significance

11.4.28 The significance of effect on a given receptor is determined by a combination of the sensitivity of the receptor and the potential magnitude of the impact.

11.4.29 This method of determining effect significance represents a change in approach to the methodology used in the PEIR assessment in which the calculated Assessment

of Level of Effect (Significance of Effects) was adjusted according to the probability of the effect occurring.

11.4.30 This risk assessment process is based upon sensitivity criteria for the receptors determined with consideration of the following guidance:

- CIRIA C552 Contaminated Land Risk Assessment: A Guide to Good Practice (2001)[25]; and
- Environment Agency: Land Contamination Risk Management (2023)[24].

### Sensitivity of Receptor

11.4.31 The sensitivity of receptors was considered on a scale of high, moderate, low or very low. The criteria for receptor sensitivity used in this assessment is provided in **Table 11.5**.

Table 11.3: Receptor Sensitivity Descriptors

| Value (Sensitivity) | Descriptor | Receptor Example |
|---|---|---|
| High | ▪ Human health risk, where receptor characteristics promote exposure and/or vulnerability to soil contamination, or ground gas.<br>▪ Groundwater that is used for human consumption and/or is within geological units that display a high level of water storage.<br>▪ Surface water body with statutory designation, e.g., Site of Special Scientific Interest. Surface water that is used for human consumption. | ▪ Residential and land uses where children are present, such as public recreation areas. Construction workers routinely exposed to soils and/or working in enclosed spaces, trenches, or excavations.<br>▪ Controlled waters receptors of national and / or strategic importance for the purposes of potable water supplies, e.g., groundwater source protection zone (‘SPZ’) 1, and Water Framework Directive surface water status High.<br>▪ High sensitivity ecological receptors whose sensitivity is directly related to soil, or controlled water quality/conditions, e.g., Ramsar or Special Area of Conservation ('SAC') site. |
| Moderate | ▪ Human health risk, where receptor characteristics provide | ▪ Workers in commercial premises (unless the buildings have features that lead to a |

| Value (Sensitivity) | Descriptor | Receptor Example |
|---|---|---|
| | limited potential for a significant contaminant linkage.<br>▪ Agricultural assets whose quality may be affected by exposure to contamination.<br>▪ Groundwater that is not currently used for human consumption, but which is within geological units that display a high level of water storage and may support water supply and/or river base flow on a strategic scale.<br>▪ Groundwater that is used for agricultural purposes (e.g., field irrigation) or public amenity.<br>▪ Non-designated surface water body of good chemical quality. | high sensitivity in relation to gas accumulation).<br>▪ Construction / maintenance workers carrying out work that involves limited, infrequent ground disturbance. Users of adjacent land during the construction process, e.g., residents in adjacent developments.<br>▪ Principal aquifer outside groundwater SPZ or Groundwater SPZ 2 or 3.<br>▪ Water Framework Directive surface water status “Good” or “Moderate”.<br>▪ Sensitive ecological receptors whose sensitivity is directly related to soil or controlled water quality e.g., National Landscape ('NL'). |
| Low | ▪ Human health risk, where receptor characteristics significantly minimise the likelihood of a significant contaminant linkage.<br>▪ Groundwater that is not currently used for human consumption, but which is either (a) within geological units capable of supporting water supplies at a local scale, or (b) present as localised bodies of groundwater within generally non-water bearing strata.<br>▪ Groundwater that is abstracted for low sensitivity industrial purposes.<br>▪ Damage to buildings/infrastructure which | ▪ Users of car parks and access roads.<br>▪ Secondary A & B aquifers outside of groundwater SPZ.<br>▪ Water Framework Directive surface water status “Poor”.<br>▪ Local habitat resources or sensitive ecological receptors associated with a Local Nature Reserve ('LNR'). |

| Value (Sensitivity) | Descriptor | Receptor Example |
|---|---|---|
| | does not pose a risk to human health. | |
| Very Low | ▪ Phytotoxic effects on non-agricultural plants.<br>▪ Groundwater that does not contribute towards baseflow and not used or have the potential to be used for drinking water supply. | ▪ Plants that have no economic value.<br>▪ Unproductive strata, and no recorded abstractions. |

### Magnitude of Impact

11.4.32 The magnitude of impact was considered on a scale of high, medium, low or negligible. The criteria for the magnitude of impacts used in this assessment are detailed in **Table 11.6**.

Table 11.4: Magnitude of Impact Descriptors

| Impact Magnitude | Descriptor | Example Impacts |
|---|---|---|
| High | ▪ Short term (acute) risk to human health.<br>▪ Persistent or extensive effects on quality of a controlled water receptor, causing the closure of an abstraction.<br>▪ Persistent or extensive effect on ecosystem receptors.<br>▪ Catastrophic damage to buildings or property on or in the vicinity of the Site. | ▪ Soil displaying highly elevated cyanide concentrations causing chronic damage to human health affecting users of the Site and in the vicinity of the Site.<br>▪ Release of Priority Hazardous Substances or substances regulated under the Water Supply (Water Quality) Regulations 2018 at concentrations that may present a direct/imminent risk to health into controlled water receptors that have active abstractions or supply water-sensitive ecosystems.<br>▪ The accumulation of ground gas (e.g., methane, carbon |

| Impact Magnitude | Descriptor | Example Impacts |
|---|---|---|
| | | dioxide, hydrogen sulphide) resulting in explosive. |
| Medium | ▪ Long term (chronic) risk to human health.<br>▪ Substantial effect on water quality such as localized degradation in surface/groundwater quality and reduction in amenity value.<br>▪ Substantial damage to ecosystems.<br>▪ Substantial damage to buildings or property. | ▪ Soil displaying contaminant concentrations in excess of generic or site-specific assessment criteria for chronic risk.<br>▪ Release of Priority Hazardous Substances, substances regulated under the Water Supply (Water Quality) Regulations 2018 or substances regulated under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 at concentrations that exceed regulatory compliance criteria into controlled water receptors that have active abstractions or supply water-sensitive ecosystems. |
| Low | ▪ Short term, minor, fully reversible human health effects.<br>▪ Minor or short-term damage to water quality or ecosystems<br>▪ Minor damage to buildings, property or crops that is directly attributable to soil contamination. | ▪ Short-term intermittent release of nuisance gases not hazardous to human health.<br>▪ Short-term release of Priority Hazardous Substances, substances regulated under the Water Supply (Water Quality) Regulations 2018 or substances regulated under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 at concentrations that exceed regulatory compliance criteria. |

| Impact Magnitude | Descriptor | Example Impacts |
|---|---|---|
| | | ▪ Elevated concentrations of sulphur and low pH levels in soils that produce aggressive ground conditions for sub-surface concrete structures and crop-growth. |
| Negligible | ▪ No significant potential for adverse human health effects.<br>▪ No damage to crops or livestock.<br>▪ Repairable effect of damage to buildings and property.<br>▪ No measurable effect on the use or function of a watercourse. | ▪ Land contamination at concentrations below generic or site-specific assessment criteria for human health, agricultural use and aggressive ground conditions.<br>▪ Release of Priority Hazardous Substances, substances regulated under the Water Supply (Water Quality) Regulations 2018 or substances regulated under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 at concentrations below regulatory compliance criteria, but greater than background concentrations. |

### Assessing Significance

11.4.33 The overall effect on each potential receptor from the Project is evaluated as set out in **Table 11.7**.

Table 11.5: Assessment of Level of Effect (Significance of Effects)

| Receptor Sensitivity | Magnitude of Impact | | | |
|---|---|---|---|---|
| | *High* | *Medium* | *Low* | *Negligible* |
| *High* | Major | Major | Moderate | Minor |
| *Moderate* | Major | Moderate | Minor | Negligible |
| *Low* | Moderate | Minor | Negligible | Negligible |
| *Very Low* | Minor | Negligible | Negligible | Negligible |

11.4.34 Effects assessed as moderate or major were considered to be 'Significant' for the purposes of this assessment whilst those assessed as minor or negligible were considered to be 'Not Significant'.

11.4.35 Those effects assessed as pertaining specifically to the Site (i.e. where the source or the receptor are present on-Site) were considered direct, whilst those where the source or receptor are present off-Site were considered to be indirect effects.

11.4.36 Best practice guidance, including Contaminated Land Risk Assessment: A Guide to Good Practice (2001)[22] and LCRM[24], for the assessment of contamination on human health or controlled waters is based on there being significant harm or the significant possibility of significant harm to sensitive receptors. The guidance does not include an assessment of whether an effect is temporary or permanent; therefore, the assessment was based on professional judgement.

## 11.5 Limitations and Assumptions

### Basis of Assessment

11.5.1 This assessment was based upon the following key control documents provided within the DCO Application:

- **Land Plans (Doc Ref. 2.1)**;
- **Works Plans (Doc Ref. 2.3)**;
- **Design Principles (Doc Ref. 7.5)**;
- **Outline CEMP (Doc Ref. 7.8);**
- **Outline Operational Management Plan ('OMP') (Doc Ref. 7.11);** and
- **Outline DEMP (Doc Ref. 7.12)**.

11.5.2 **Illustrative Project Drawings – Not for Approval (Doc Ref. 2.6)** have also been used to inform the assessment as they provide an indication of how the Project could be designed and constructed in accordance with the above control documents.

### Assumptions

11.5.3 The list below details the key assumptions of this Chapter with regards to the construction of the Project:

- Construction works are expected to commence in 2026 and be fully complete in 2027;
- The operational period for the Project is 40 years; and
- Decommissioning is expected to take 12 months, and for the purposes of the assessment is expected to occur after 40 years of operational phase of the Project. Following the operational lifetime of the Project, all infrastructure constructed as part of the Project (with the exception of elements of Work No. 4 that are within Sellindge Substation, any repairs, upgrades or replacements of/to the existing bridge / drain crossings, PRoW footbridges and highway improvements) will be removed and recycled or disposed of in accordance with good practice, market conditions and available technologies for recycling/reprocessing at that time.

### Limitations

11.5.4 The information reviewed should not be considered exhaustive and is considered to constitute the best available data pertaining to and representative of the ground conditions. However, it is considered that the data obtained is sufficient to identify the likely significant effects of the Project and appropriate mitigation measures.

11.5.5 The Site walkover surveys and ground investigation work were planned and undertaken using the Order limits and proposed layout at the time. All surveys progressed to inform this Chapter's assessment are considered to have provided sufficient coverage of the final Order limits for the assessment purposes.

11.5.6 It is assumed that the existing baseline conditions as detailed within the **ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study (Doc Ref. 5.4)** and that the ground conditions and contaminative status of the Site as detailed in **ES Volume 4, Appendix 11.3: Ground Investigation Report** (**Doc Ref. 5.4**) are reflective of those at the commencement of the Project. The contamination status of the Site and general baseline conditions would not be expected to materially alter prior to the commencement of the Project.

11.5.7 The ground investigation works were progressed to target the potential presence of contamination across the Site, in particular potential Made Ground materials, identified within **ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study (Doc Ref. 5.4)** and Site walkover surveys rather than target features of the Project.

11.5.8 The findings of the ground investigation work rely upon the determination from 'point sources' of information (e.g., windowless sample boreholes and trial pits) and the interpretation of data between the 'point sources'.

## 11.6 Baseline Conditions

11.6.1 This Section summarises the baseline conditions as outlined within the ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study Report and ES Volume 4, Appendix 11.3: Ground Investigation Report (Doc Ref. 5.4).

### Site Description

11.6.2 A description of the Site is provided in ES Volume 2, Chapter 2: Site and Context (Doc Ref. 5.2).

### Site History

11.6.3 The Site's history has been reviewed with reference to past editions of County Series and OS mapping provided within the Groundsure data (see **ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study, Annex B (Doc Ref. 5.4)**).

11.6.4 Historically, the Site and surrounding land predominantly comprised agricultural land and has remained largely unchanged. Historical mapping indicates that the Sellindge sewage treatment works to the east of the Cable Route Corridor area was first recorded in 1971, and further industrial land recorded to the north of the Site in 1985. A number of quarries and limekiln were present to the south east and south of the Order limits from 1871-1975.

### Geological and Environmental Setting

#### Geology

11.6.5 The initial assessment of the geological setting across the Site is based on a review of data sources such as (but not limited to) BGS GeoIndex interactive viewer and the Groundsure data. The ground investigation works provided site specific information on the ground conditions encountered. The plan of the ground investigation positions is shown in **ES Volume 3, Figure 11.1 (Doc Ref. 5.3)**.

#### *Made Ground*

11.6.6 The Groundsure data does not identify any Made Ground to be present across the Site.

11.6.7 A review of the available BGS borehole records located adjacent to the HS1/Network Rail railway line recorded a thick horizon of Made Ground deposits (up to 8m depth) generally logged as grey green to yellow brown slight sandy slightly gravelly clay. The borehole records indicated that values recorded from standard penetration tests ('SPTs') within the Made Ground deposits ranged between 6 and 8.

11.6.8 The Site walkover surveys identified frequent brick fragments were recorded within a gravel surface cover layer. This cover layer was identified within several fields, and this indicates that reworked natural ground may underly the Site.

11.6.9 The ground investigation identified anthropogenic material such as brick, cement and ceramics within TP01, TP02, TP05, WS02, WS04, WS05 and WS08 to a maximum depth of 0.8mbgl. This material was found sporadically across the Site and not as a consistent defined layer. It is not considered that Made Ground has been encountered on-Site as a definitive subsurface layer. The anthropogenic material is likely due to soil turnover activities such as ploughing.

*Superficial Deposits*

11.6.10 The Groundsure data (provided in **ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study, Annex B (Doc Ref. 5.4)** of indicates a band of superficial deposits associated with the East Stour River and immediate tributaries is present running east-west across Fields 19, 23, 24, 26-29, and the Cable Route Corridor area according to BGS mapping data. The superficial deposits are identified as Alluvium and described as 'Clay, Silt, Sand and Gravel'. The remainder of the Site is not recorded as being underlain by superficial deposits.

11.6.11 A review of the available BGS borehole records located adjacent to the HS1/Network Rail railway line indicates that the Alluvium deposits are present typically around 1.5m thick and recorded as soft to firm grey green to orange brown laminated silty clay with rare to occasional organic matter. The borehole records indicated that values recorded from SPTs within the Alluvium deposits ranged between 5 and 21.

11.6.12 The ground investigation identified superficial deposits in the form of sand, gravel and clay were recorded to a maximum depth of 5mbgl as follows:

- Sand deposits between 0.3m and 3.70mbgl typically comprised loose to very dense, light brownish yellow, slightly clayey, slightly gravelly, fine to medium sand. SPTs values within the sand horizons ranged between 8 and 16;
- Gravel deposits between 2m to 2.7mbgl generally comprised loose, light yellowish brown, silty gravel of mixed natural lithologies. A SPT value within the gravel horizon wACECas recorded as 10; and
- Clay deposits between 0.45m and 5mbgl typically comprised soft to firm greyish yellow slightly silty, slightly sandy clay, or firm to stiff grey/blueish grey slightly silty, slightly sandy clay. SPTs values within the clay horizons ranged between 4 and 26.

*Bedrock Geology*

11.6.13 The BGS geological mapping (provided in **ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study, Annex B (Doc Ref. 5.4)** indicates that the Site is underlain by the following bedrock lithologies as recorded by the BGS 1:50,000 scale geological mapping:

- **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'. Parent unit is the Lower Greensand Group and bounds Hythe Formation within Fields 4 - 6, 8 - 13, 20, 22, 25, 26 and 29 and also beneath the Sellindge Substation.
- **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.

11.6.14 A review of the available BGS borehole records (provided in **ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study, Annex B (Doc Ref. 5.4)** located adjacent to the HS1/Network Rail railway line recorded the bedrock geology as follows:

- **Hythe Formation:** Firm to stiff yellow brown mottles orange slightly sandy clay, and Medium dense yellow brown clayey fine sand with occasional white calcareous lenses. The borehole records indicated that values recorded from SPTs within the Hythe Formation ranged between 10 and 19;
- **Atherfield Clay Formation:** Stiff fissured grey clay with a little sand and occasional gravel of lithorelics. The borehole records indicated that values recorded from SPTs within the Atherfield Clay Formation ranged between 21 and 32; and
- **Weald Clay Formation:** Firm to stiff blue grey to brown fissured clay with occasional lamination/lenses of silt and sand. The borehole records indicated that values recorded from SPTs within the Weald Clay Formation ranged between 16 and 50.

11.6.15 The ground investigation works (**ES Volume 3, Appendix 11.3: Ground Investigation Report** (**Doc Ref. 5.4**) encountered bedrock in TP02 at 1.50 mbgl, and was recorded as '(Medium strong) light grey sandy partially weathered limestone with rare, fragmented fossil content.

### Contamination Assessment

11.6.16 The soil samples were compared to a series of published Generic Assessment Criteria ('GAC') for human health risk assessment purposes derived from Land Quality Management ('LQM') and Chartered Institute of Environmental Health ('CIEH') 'Suitable for Use' Levels ('S4UL') and the Category 4 Screening Levels ('C4SL').

11.6.17 The GACs were selected based upon a "commercial end-use" scenario and using a Soil Organic Matter ('SOM') content of 1%, as the most conservative approach.

11.6.18 The comparison of results of the solid laboratory chemical testing against the selected GACs showed no exceedances against the relevant screening criteria. In addition, no asbestos was identified during the screening of samples.

11.6.19 The records of the environmental monitoring visit undertaken on 6 April 2023 indicate that the majority of the Site would provisionally be classified as Gas Characteristic Situation 2, as per CIRIA C665[36]. This is due to elevated carbon dioxide concentrations of greater 1% v/v (WS01, WS07 and WS09) or gas screening value of greater than 0.07l/hour (WS06). The remaining two monitoring boreholes (WS05 and WS10) were classified as Gas Characterisation Situation 1.

11.6.20 The Project Substation and Intermediate Substations, are proposed in Field 26. This is where WS10 and the Gas Characterisation Situation 1 area is located, indicating that enclosed spaces in the area are unlikely to require ground gas protection measures.

11.6.21 The development proposed across the areas classified as Gas Characteristic Situation 2 comprise the PV Arrays, Inverter Stations (including BESS), Intermediate Substations, Project Substation and Sellindge Substation Extension.

11.6.22 The PV Arrays are in the open-air with no confined spaces for the potential accumulation of gases. This therefore removes the pathway for ground gas migration and accumulation.

11.6.23 All other infrastructure (e.g. the Inverter Stations (including BESS), Intermediate Substations, Projects Substation and Sellindge Substation Extension) will be sited on concrete or skid foundations, which will help to break the pollutant pathway between ground and containers.

11.6.24 It is understood that any operational/maintenance works associated with the containerised Inverters, will be undertaken outside of the units in the open air therefore removing the potential for inhalation pathway by human health receptors.

11.6.25 In accordance with the **Outline CEMP (Doc Ref. 7.8)**, the BESS, the Intermediate Substations and the Project Substation buildings will have active and/or passive ventilation systems installed thereby removing the potential for ground gas accumulation.

11.6.26 Additionally, it is expected that the Project Substation buildings would be raised to allow cable infrastructure to enter from beneath. The void space between the foundations and the Project Substation building will allow for dispersion and prevent potential accumulation of any ground gases.

11.6.27 As such, it is considered unlikely that ground gas protection measures will be necessary for the areas provisionally designated as Gas Characteristic Situation 2.

### Hydrogeology

11.6.28 The band of Alluvium superficial deposits running east-west across Fields 19, 23, 24, 26-29, and the Cable Route Corridor area is classed as a ‘Secondary A’ aquifer. The permeability of the Alluvium deposits is classified as very low to high intergranular flow. The groundwaters stored within the Alluvium deposits are considered to be of medium vulnerability according to the BGS.

11.6.29 The Weald Clay and Atherfield Clay Formations which form the majority of the bedrock beneath the Site are classed as unproductive. The permeability of the Weald Clay and Atherfield Clay Formations is classified by the BGS as very low to low flow through fractures. Due to their low productivity, the groundwaters stored within the Weald Clay and Atherfield Clay Formation aquifers are not classified as vulnerable.

11.6.30 The Hythe Formation bedrock, underlying Fields 9, 10, 20 and part of Fields 25 and 29, is classed as a 'Principal' aquifer. The permeability of the Hythe Formation is classified by the BGS as high with intergranular and fracture flow. The vulnerability of the groundwater within the Hythe Formation principal aquifer is classed as medium to high by the BGS.

11.6.31 The Groundsure data identified no active licensed groundwater abstractions and no groundwater source protection zones across the Site and surrounding 250m of the Site.

11.6.32 The Site is situated within an area which is partially covered by a groundwater body managed by the Water Framework Directive ('WFD'). The groundwater body is known as the Kent Greensand Eastern (ref. GB40701G501400). As part of the 2019 WFD assessment cycle, the Kent Greensand Eastern groundwater body was classified as 'Poor' Overall rating, with 'Poor' Chemical and Ecological ratings.

### Hydrology

11.6.33 There are 255 records of Water Networks (as classified by OS MasterMap) within 250m of the edge of the Order limits. A total of 47 of these recorded networks pertain to watercourses located within the Order limits and are described as inland rivers not influenced by normal tidal action.

11.6.34 The closest surface water body to the Site is the East Stour River, which traverses the northern boundary of the Site and crosses the north-eastern fields of the Site.

11.6.35 During the walkover surveys, several surface water features were identified including the East Stour River located along the northern boundary of Field 19 and through Field 25 to 29 and along the Cable Route Corridor. Additionally, un-named, minor watercourses were identified as follows:

- Present along the northern boundary of Field 3 and 7;
- Present along the southern boundary of Field 19; and
- Present between Field 20, 21 and 22.

11.6.36 There are two water body catchments managed under the WFD located within the Site. The relevant surface water body catchment has been identified as Romney Marsh (between Appledore and West Hythe) (ref. GB107040019700), and East Stour (ref. GB107040019640). The 2019 WFD classification for the two catchments are as follows:

- Rodney Marsh, biological classification: moderate; chemical classification:

fail; and overall classification: moderate; and

- East Stour River, biological classification: moderate; chemical classification: fail; and overall classification: moderate.

11.6.37 There is one record of WFD surface water bodies identified on-Site, pertaining to the East Stour River (ref. GB107040019640). As part of the 2019 WFD assessment cycle, the East Stour River was classified as a moderate overall rating, with a failure chemical rating and moderate biological rating.

### Landfills & Waste Management

11.6.38 There are no records of active or recent waste landfill sites held by the Environment Agency across the Site and no records of historical landfill sites identified from the Local Authority across or within a 250m radius from the Site.

11.6.39 There is one record of a BGS historical landfill, which is located 143m west of the Site, located north of Aldington, and pertains to Aldington Quarry.

11.6.40 There are three records of historical landfills, based on the Environment Agency records, within 250m of the Site. The records pertain to the following:

- Clap Hill Landfill (ref. AS30). Located immediately adjacent to the edge of the Order limits, south of Handen Farm. Licence holder: Mr Lee-Eard. The landfill accepted Inert, Commercial, and Household wastes, and last accepted waste in December 1974;
- Aldington Quarry (ref. AS5). Located 40m west, north of Aldington village. Licence holder: Ashford Rural District Council. The landfill accepted Inert and Household wastes, and last accepted waste in December 1974; and
- Howarth Mill Lane Landfill (ref. AS17). Located 65m south east of the edge of the Order limits, at Aldington Frith. The landfill accepted Inert and Commercial wastes. There is no information pertaining to the license holder and waste acceptance dates.

11.6.41 There is one record of a historical waste site located 20m north of the Site at Woodleas Farm. The historical waste site has been described as a waste transfer depot (ref. 11/00276/AS).

11.6.42 There are four licensed waste sites within 250m of the Site, and are as follows:

- Three duplicated records are associated with Woodleas Farm, licence no. BUT028 and ref. EA/EPR/AB3500UG/A001 & EA/EPR/WE8476AA/A001, operated by R H Butler Limited and Woodleas Farm Ltd. The site is located 72m east of the edge of the Order limits and pertain to a Household, Commercial and Industrial ('HCI') waste transfer station dealing with 25,000 to 75,000 tonnes of waste per annum.
- The fourth record is associated with a site located 120m east of the edge of the Order limits, Sellindge Waste Waterworks operated by Southern Water Services Limited (licence no. SOU013 and ref. EA/EPR/PP3794HH/A001) and is outlined as a biological treatment facility managing up to 25,000

tonnes of waste per annum.

11.6.43 There are 171 waste exemptions within 250m of the Site, with 23 records located across the Site relating to two exemptions. The two on-site waste exemptions are outlined as follows:

- EPR/VF0738RU/A001 Bank Farm TN25 7DF relates to 22 waste exemption records which permit the burning of waste, treatment of waste food, treatment of waste in biobed or biofilter, spreading waste on agricultural land to confer benefit, physical treatment of oil and fat to produce biodiesel, use of depolluted end of life vehicles for vehicle parts, pig and poultry ash, deposit of waste from dredging inland waters, storage of waste in a secure container or place, cleaning, washing, spraying or coating relevant waste, preparatory treatments, use of waste in construction, recovery of scrap material, incorporation of ash into soil, burning of waste as a fuel in small appliance, use of waste derived biodiesel as fuel, use of waste for a specified purpose, storage of sludge and use of mulch; and
- WEX216477, east of Evegate Mill. Exemption permits the spreading waste on non-agricultural land.

11.6.44 The location of the recorded waste and landfill sites and waste exemptions referenced above are shown on **ES Volume 3, Figure 11.2: Landfill and Waste Management Plan (Doc Ref. 5.3)**.

### Radon

11.6.45 The BRE 'Guidance on Protective Measures for New Dwellings' (BR 211) was consulted to review the geological radon potential of the Site. The BRE guidance document indicates that no radon protective measures are required for any new buildings or structures on the Site.

11.6.46 The radon data for UK Health Security Agency estimates that the majority of the Site is situated in an area whereby the maximum radon potential is 1%-3%.

### Environmental Designations

11.6.47 There are two records of designated Ancient Woodland within 250m of the Site which are described as ancient, replanted woodland. These are associated with Backhouse Wood LWS immediately south of Fields 28 and 29 and Handen Wood approximately 85m south of Field 8. There are no other statutory environmental designations (e.g. Ramsar sites, Special Areas of Conservation) within 250m of the Site.

11.6.48 The above detailed recorded environmental designations within 250m of the Site are presented within **ES Volume 3, Figure 11.3: Environmental Designations Location Plan (Doc Ref. 5.3)**.

11.6.49 Furthermore, Aldington Sand Pit LWS (a non-statutory designate site) is located approximately 45m south-east of the Site.

### Unexploded Ordnance ('UXO') Risk Assessment

11.6.50 UXO specialist Zetica has carried out an UXO Desk Study and Assessment of the Site, which forms part of **ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study, Annex E** (**Doc Ref. 5.4)**.

11.6.51 No records of bombing or military activity on the Site during World War One ('WWI') have been found.

11.6.52 Zetica indicated no records have been found indicating that the Site was bombed during WWII. Records indicate that the nearest High Explosive ('HEx') bomb fell on the railway line near Smeeth Station, approximately 30m north of the Site (Field 26) on 19 April 1944.

11.6.53 The Zetica report identified a record of one Vergeltungswaffe-1 ('V1') missile landing on-Site in Field 26 and a further three records of V1 missiles within 250m of the Site.

11.6.54 The above detailed UXO information is presented in ES Volume 3, Figure 11.4: Unexploded Ordnance Hazard Location Plan (Doc Ref. 5.3).

### Mining, Ground Workings, and Natural Cavities

#### *Mining*

11.6.55 There are 12 records of non-coal mining activities located across and within 250m of the Site. Three records pertain to potential localised small-scale underground mining of iron ore that cover the majority of the Site, and appear to be related to the mapped extent of the Weald Clay Formation. The remaining nine records relate to the sporadic underground mining for limited extents of sand, which appear to be related to the mapped extent of the Hythe Formation.

11.6.56 There are no records of coal mining, brine mining, clay mining, tin mining, or gypsum areas within 250m of the Order limits.

#### *Ground Workings*

11.6.57 BritPits is a database of currently active or closed surface and underground workings maintained by the BGS. There are no records of Brit Pits on-Site. There are three records pertaining to surface mineral working of limestone off-Site, between Fields 17 and 20, within Aldington that are located 83m south west, 138m south and 166m north west of the edge of the Order limits, respectively. All records display a ceased status.

11.6.58 The Historical Land Use Database provided within the Groundsure report see (**ES Volume 4, Appendix 11.2: Phase I Geoenvironmental and Geotechnical Desk Study, Annex B (Doc Ref. 5.4)**) has identified 68 historical surface ground working features across or within 250m of the Site. These include:

- Pond and water body (on-Site);
- Unspecified ground workings (on-Site);
- Cuttings (on-Site);

- Disused quarry, south of the Site east and west of Aldington;
- Unspecified heap, south of Site at Bank Farm; and
- Sellindge Sewage Treatment Works, west of the Site at Sellindge Substation.

*Natural Cavities*

11.6.59 There are no records of natural cavities on the Site. There is one record located 125m south of the Order limits. This record pertains to gullies / fissures due to cambering.

### Future Baseline

11.6.60 The existing baseline conditions (with respect to contaminated land) are not expected to change in the future baseline scenario. Given the current site use it is expected that the existing baseline conditions with respect to contaminated land are expected to be representative of the future baseline.

11.6.61 It is widely accepted that climate change will result in more variable weather conditions across the United Kingdom, and the increased potential of extreme events. These events may affect controlled water receptors (groundwater and surface waters); however, it is considered unlikely that their sensitivity will change.

### Summary of Receptors and Sensitivity

11.6.62 The sensitive receptors which have been considered as part of this assessment are summarised in **Table 11.8**.

Table 11.6: Summary of Receptor Sensitivity

| Receptor | Sensitivity (Value) |
|---|---|
| *Construction Phase Only* | |
| Construction Workers (Human Health) | High |
| *Construction, Operational and Decommissioning Phases* | |
| Adjacent Site Users (Human Health) | Moderate |
| Groundwater aquifers – Principal (Hythe Formation), (Controlled Waters) | Moderate |
| Groundwater aquifers – Secondary A (Alluvium Deposits), (Controlled Waters) | Low |
| Unproductive (Atherfield and Weald Clay Formation), (Controlled Waters) | Very Low |
| Surface water including East Stour River (WFD rating Moderate), and on-Site streams and land drains. (Controlled Waters) | Moderate |

| Receptor | Sensitivity (Value) |
|---|---|
| Ecosystem – Fauna and Flora (No sensitive land designations) | Very Low |
| *Operational and Decommissioning Phases Only* | |
| Maintenance Workers (Operational Phase)<br>Decommissioning Workers (Decommissioning Phase)<br>(Human Health) | Moderate |
| Project structures/buildings (Operational Phase)<br>(Built Receptors) | Low |

## 11.7 Embedded Design Mitigation

### Construction Phase

11.7.1 An **Outline CEMP (Doc Ref. 7.8)** has been developed for the Project following discussions with relevant stakeholders and provides details of the required mitigation measures throughout the construction phase to suitably protect sensitive receptors from potentially contaminative activities.

11.7.2 The **Outline CEMP (Doc Ref. 7.8)** is submitted alongside this ES and provides the framework for detailed CEMP(s) to be produced following the granting of the DCO, as secured by a Requirement in the **Draft DCO (Doc Ref. 3.1)**. The **Outline CEMP (Doc Ref. 7.8)** incorporates the following mitigation measures:

*Pollution Prevention – Human Health*

11.7.3 Work will be carried out in accordance with relevant CDM Regulations 2015 to manage the health, safety and welfare of site workers during construction of the Project.

11.7.4 Site workers will be required to wear appropriate personal protective clothing and equipment ('PPE') that are suitable for the site activities undertaken.

11.7.5 Appropriate methods of working will be selected in order to minimise the disturbance of soils and water, where possible.

11.7.6 All the workers on-Site will be made aware of potential contamination issues, if applicable, on the Site during the induction and will use best practice techniques during all construction activities.

11.7.7 An Emergency Preparedness Plan ('EPP') will be prepared by the Principal Contractor and all staff will be made aware of its contents and procedures.

11.7.8 The **Outline CEMP (Doc. Ref. 7.8)** includes a commitment to undertake a watching brief for unanticipated ground conditions during construction. The watching brief

protocol is summarised in the Unanticipated Ground Conditions section later on in this section.

11.7.9 A competent/licensed contractor will remove asbestos containing materials and other materials and structures contaminated with asbestos fibres, if found on-Site.

11.7.10 All excavation work will be carried in accordance with the Control of Asbestos Regulations 2012 and agreed safety measures (such as damping down during periods of dry weather and sheeting of stockpile and haulage) will be in place during any works across areas where asbestos may be encountered, although not considered likely given the greenfield nature of the Site.

11.7.11 Excavated materials will be segregated to ensure no cross-contamination of any potentially contaminated and clean excavated materials, and to minimise the long-term storage and management of excavated materials.

11.7.12 The **Outline CEMP (Doc Ref. 7.8)** includes an outline soil management plan which sets out measures to ensure the sustainable use of soil in line with good practice and guidance.

*Pollution Prevention – Controlled Waters & Ecosystem*

11.7.13 Vehicles and plant will be well maintained to prevent accidental pollution from leaks. Static machinery and plant will include drip trays beneath oil tanks / engines / gearboxes / hydraulics, which will be checked and emptied regularly via a licensed waste disposal operator.

11.7.14 Areas at risk of spillage, such as vehicle maintenance areas and hazardous substance stores (including fuel, oils and chemicals) will be adequately bunded and secure areas with impervious walls and floors, with a capacity of 110% of substance volume, will be provided for the temporary storage of fuel, oil and chemicals on Site during construction. Valves and trigger guns will be protected from vandalism and kept locked up when not in use.

11.7.15 Machinery will be routinely checked to ensure it is in good working condition to reduce the risk of leaks.

11.7.16 Any tanks and associated pipe work containing oils and fuels will be double skinned and be provided with intermediate leak detection equipment.

11.7.17 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.

11.7.18 All construction, oil, fuel and diesel materials will be stored as far from the nearby water bodies and drainage as reasonably possible.

11.7.19 Piling will be carried out in accordance with the Environment Agency Guidance Note on Piling / Penetrative Ground Improvement Methods on Land Affected by Contamination and ground investigations will inform the Foundation / Piling Works

Risk Assessment which will define the appropriate piling methods and foundation design to mitigate risk.

11.7.20 The **Outline CEMP (Doc Ref. 7.8)** details mitigation measures based upon best industry practice to minimise the risk to the groundwater aquifers beneath the Site during the horizontal directional drilling of cable.

*Unanticipated Ground Conditions*

11.7.21 A general watching brief for evidence of contamination should be undertaken during construction works. If visual / olfactory evidence of contamination is encountered works in this area will cease and the procedure set out in the **Outline CEMP (Doc Ref. 7.8)** will be followed.

11.7.22 According to the watching brief protocol, a suitably qualified and experienced environmental consultant / engineer should be contacted. The assigned environmental consultant / engineer will be responsible for liaising with ABC Environmental Protection Team as appropriate throughout this protocol.

11.7.23 Under the direction of the environmental consultant / engineer, the area of concern will be examined. If required, samples of potentially contaminated material will be taken and analysed at an accredited laboratory to determine if the material meets the required criteria to be protective of human health and the environment.

11.7.24 If concentrations above the criteria are encountered, the findings of the assessment will be used to determine the risks and the appropriate course action. If required a remediation strategy will be submitted to and approved by ABC EPT. Any necessary remedial works will be undertaken as part of, and allowed for by the Site Wide Works clause (c) “remediation of contamination” detailed in Schedule 1 of the **Draft DCO (Doc Ref. 3.1)**.

## Operational Phase

11.7.25 An **Outline OMP (Doc Ref. 7.11)** has been developed for the Project to provide details of the mitigation measures required throughout the operational phase to suitably protect sensitive receptors from potentially contaminative activities. The **Outline OMP (Doc Ref. 7.11)** incorporates the following mitigation measures:

*Pollution Prevention – Human Health*

11.7.26 Maintenance workers will be required to wear appropriate PPE that are suitable for the Site activities undertaken.

11.7.27 Confined space entry control including gas monitoring and respiratory protection equipment will be adopted for works entering and working in confined spaces.

11.7.28 A marker membrane will be installed within service tranches where the presence of contaminated ground beneath has been confirmed. All service trenches will be backfilled with certified clean materials.

11.7.29 Due to the control measure in place, the sensitivity value of maintenance workers is only considered moderate in line with **Table 11.5**.

*Pollution Prevention – Controlled Waters and Ecosystem*

11.7.30 The design, maintenance and operational phase of the Project Substation will be in line with the best practice and guidance with mitigation measures in place for the appropriate storage and management of potentially polluting substances, emergency spill response procedures, collection, and control of any potentially contaminated surface water run-off.

11.7.31 The **Outline OMP (Doc Ref. 7.11)** also details the Emergency Spillage Action Plan ('ESAP') which will be prepared as part of the detailed OMP and will set out the procedures on the response to a spillage, including how it is contained and reported to the Environment Agency, if necessary.

11.7.32 The **Outline OMP (Doc Ref. 7.11)** includes measures pertaining to areas of Site traffic as well as fuel / oil storage and plant refill points to ensure the capture of any leaks / spills and to prevent contamination from entering the surface water network.

11.7.33 An **Outline Operational Surface Water Drainage Strategy ('OSWDS') (Doc Ref. 7.14)** provides details of the proposed drainage strategy for the Project and specific measures for the Project Substation, Inverter Stations and BESS Units.

11.7.34 The **Outline OSWDS (Doc Ref. 7.14)** details that any fire waters produced as part of fire prevention measures for Project electrical infrastructure (e.g. Project Substation and BESS) will be collected and retained to be pumped to tanker and removed from the Site for treatment and disposal at a suitable licenced facility. Furthermore, the Project Substation gravel compound will be lined and fitted with a penstock to prevent migration to controlled waters.

*Pollution Prevention – Built Environment*

11.7.35 Construction materials will be of a specification to mitigate the potential for chemical attack to sub-surface concrete structure due to aggressive ground conditions. The use of the specified concrete compositions as detailed in the BRE Special Digest[39] for a site designated as ACEC AC-1s will ensure that any sub-surface concrete structures should not be adversely affected by potentially aggressive ground conditions.

11.7.36 Any hotspots or areas of soft ground across the Site will be removed and replaced with inert and geotechnically suitable imported material. Laboratory testing of all imported material will be undertaken to confirm their chemical and geotechnically suitability for use.

11.7.37 Gas protection measures, as per BS8485:2015 'Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings', will be used if any enclosed or underground spaces are included.

### Decommissioning Phase

11.7.38 The mitigation measures to be in place during the decommissioning phase are expected to be similar to those required for the construction phase to minimise potential polluting activities and protect sensitive receptors. These are as follows:

*Pollution Prevention – Human Health*

11.7.39 The **Outline DEMP (Doc Ref. 7.12)** includes a commitment to undertake a watching brief for unanticipated ground conditions during decommissioning. The watching brief protocol for decommissioning follows the same approach as is summarised for the construction phase in the 'Unanticipated Ground Conditions' section at **Paragraphs 11.7.21 to 11.7.24**.

11.7.40 Due to the control measures in place the sensitivity value is considered to be moderate in line with **Table 11.5**.

*Pollution Prevention – Controlled Waters and Ecosystem*

11.7.41 The **Outline DEMP (Doc Ref. 7.12)** includes pollution prevention measures to help minimise potential land contamination such as for leak and spill prevention from vehicles/storage to include (but not limited to): 110% capacity secure bunded area; safe disposal of leaking/empty containers; adequate availability of spill clean-up equipment; utilisation of drip trays at all designated refill points; silt traps; and preparation of incident response plans.

## 11.8 Assessment of Effects

### Construction Phase

Human Health – Construction Workers

11.8.1 The soil samples collected and tested for the presence and concentrations of existing contaminants across the Site during the ground investigation recorded no exceedances when compared to the relevant generic assessment criteria (LQM/CIEH S4ULs and DEFRA C4SL) with regards to risk to human health receptors for a commercial end-use development.

11.8.2 The results of the environmental monitoring from the Site did not record the presence of ground gases which could pose a risk to Construction Workers.

11.8.3 Additionally, the inclusion of the embedded mitigation measures as detailed in the **Outline CEMP (Doc Ref. 7.8)** will reduce the exposure to construction workers (high sensitivity receptors) from the risks of inhalation, ingestion, and dermal contact of potentially contaminated materials and ground gas and therefore reduce the magnitude of impact to negligible. Therefore, the significance of effect is **Minor adverse** (not significant).

Human Health – Adjacent Site Users

11.8.4 The soil samples collected and tested for the presence and concentrations of existing contaminants across the Site during the ground investigation recorded no

exceedances when compared to the relevant generic assessment criteria (LQM/CIEH S4ULs and DEFRA C4SL) with regards to risk to human health receptors for a commercial end-use development.

11.8.5 The inclusion of the embedded mitigation measures as detailed in the **Outline CEMP (Doc Ref. 7.8)** will reduce the exposure levels to adjacent site users (moderate sensitivity receptors) from the risks of inhalation, and ingestion of potentially air-borne contaminated materials and thereby reduce the magnitude of impact to negligible. Therefore, the significance of effect is **Negligible** (not significant).

### Controlled Waters – Groundwaters

#### *Hythe Formation - Principal Aquifer*

11.8.6 The Hythe Formation comprises a small portion of the bedrock geology underlying the Site. Groundsure data indicates there are no SPZs or abstraction licences across the Site.

11.8.7 The soil samples collected from across the Site during the ground investigation were tested for the presence of contaminants. The results indicated that elevated concentrations of contaminants associated with historical use were not present across the Site and posed no risk to groundwaters.

11.8.8 The inclusion of the embedded mitigation measures as detailed in the **Outline CEMP (Doc Ref. 7.8)**, such as leak and spill prevention from vehicles / storage, and the safe working procedures for the proposed horizontal directional drilling, will reduce the likelihood of the migration and / or discharge of leached and mobile contaminants from leakages or spills to the Hythe Formation principal groundwater aquifer (moderate sensitivity receptor) underlying the Site (low magnitude of impact). Therefore, the significance of effect is **Minor adverse** (Not Significant).

#### *Alluvium Superficial Deposits - Secondary A Aquifer*

11.8.9 The Alluvium Superficial deposits form a band of sediments associated with the East Stour River that present across Fields 19, 23, 24, 26-29, and the Cable Route Corridor area. Groundsure data indicates there are no SPZs or abstraction licences across the Site.

11.8.10 The soil samples collected from across the Site during the ground investigation were tested for the presence of contaminants. The results indicated that elevated concentrations of contaminants associated with historical site use were not present across the Site and posed no risk to groundwaters.

11.8.11 The inclusion of the embedded mitigation measures as detailed in the **Outline CEMP (Doc Ref. 7.8)**, such as leak and spill prevention from vehicles / storage, and the safe working procedures for the proposed horizontal directional drilling, will reduce the likelihood of the migration and / or discharge of leached and mobile contaminants. Therefore, the significance of effects posed by the Project to the Alluvium Superficial deposits Secondary A groundwater aquifer (low sensitivity

receptor) underlying the Site (low magnitude of impact) is **Negligible** (not significant).

*Atherfield and Weald Clay Formations - Unproductive Aquifers*

11.8.12 The Atherfield and Weald Clay Formations represent the predominant bedrock geology that are present beneath the Site. The Groundsure data indicates there are no SPZs or abstraction licences across the Site.

11.8.13 The soil samples collected from across the Site during the ground investigation were tested for the presence of contaminants. The results indicated that elevated concentrations of contaminants associated with historical site use were not present across the Site and posed no risk to groundwaters.

11.8.14 The inclusion of the embedded mitigation measures as detailed in the **Outline CEMP (Doc Ref. 7.8)**, such as leak and spill prevention from vehicles / storage, and the safe working procedures for the proposed horizontal directional drilling, will reduce the likelihood of the migration and / or discharge of leached and mobile contaminants from leakages or spills to the Atherfield and Weald Clay Formations - Unproductive groundwater aquifers (very low sensitivity receptors) underlying the Site (low magnitude of impact). Therefore, the significance of effect is **Negligible** (not significant).

Controlled Waters – Surface Waters (East Stour River)

11.8.15 The East Stour River traverses Fields 26-29 and the Cable Route Corridor and is located adjacent to the south of Field 25 and north of Field 19 and 24. It was classified in 2019 as having a Moderate overall WFD rating.

11.8.16 The soil samples collected from across the Site during the ground investigation were tested for the presence of contaminants. The results indicated that elevated concentrations of contaminants associated with historical site use were not present across the Site and posed no risk to surface waters.

11.8.17 The inclusion of the embedded mitigation measures as detailed in the **Outline CEMP (Doc Ref. 7.8)**, such as silt traps; and preparation of incident response plans, will reduce the likelihood of the migration of leached and mobile contaminants from leakages or spills into the surface water features (East Stour River) (moderate sensitivity receptor) present across and in the vicinity of the Site (low magnitude of impact). Therefore, the significance of effect is **Minor adverse** (Not Significant).

Ecosystem

11.8.18 There are no areas of designated environmentally sensitive land across the Site. The majority of the Site is currently in agricultural use (arable and grazing). Ancient woodland is present adjacent to the edge of the Order limits at Backhouse Wood LWS.

11.8.19 The soil samples collected from across the Site during the ground investigation were tested for the presence of contaminants. The results indicated that elevated

concentrations of contaminants associated with historical site use were not present across the Site.

11.8.20 The inclusion of the embedded mitigation measures as detailed in the **Outline CEMP (Doc Ref. 7.8)**, such as a watching brief during earthworks and leak and spill prevention from vehicles / storage, will reduce the likelihood of contamination affecting the local ecosystem (very low sensitivity receptors) across the Site (negligible magnitude of impact). Therefore, the significance of effect is **Negligible** (not significant).

### Operational Phase

#### Human Health – Maintenance Workers

11.8.21 The inclusion of the embedded mitigation measures as detailed in the **Outline OMP (Doc Ref. 7.11)**, including the use of appropriate PPE and safe storage and use of any potentially hazardous chemicals, will reduce the exposure levels to maintenance workers (moderate sensitivity receptor) from the risks of inhalation, ingestion, and dermal contact of potentially contaminated materials and ground gas (negligible magnitude of impact). Therefore, the significance of effect is **Negligible** (not significant).

#### Human Health – Adjacent Site Users

11.8.22 The inclusion of the embedded mitigation measures as detailed in the **Outline OMP (Doc Ref. 7.11)** will reduce the exposure levels to adjacent site users (moderate sensitivity receptors) from the risks of inhalation, and ingestion of potentially air-borne contaminated materials and thereby reduce the magnitude of impact to negligible. Therefore, the significance of effect is **Negligible** (not significant).

#### Controlled Waters – Groundwaters

##### *Hythe Formation - Principal Aquifer*

11.8.23 The inclusion of the embedded mitigation measures as detailed in the **Outline OMP (Doc Ref. 7.11)** and **Outline OSWDS (Doc Ref. 7.14)** will minimise the potential for the discharge and vertical migration of leached and mobile contaminants from leakages or spills to the Hythe Formation principal groundwater aquifer (moderate sensitivity receptor) underlying the Site (low magnitude of impact). Therefore, the significance of effect is **Minor adverse** (not significant).

##### *Alluvium Superficial Deposits – Secondary A Aquifer*

11.8.24 The inclusion of the embedded mitigation measures as detailed in the **Outline OMP (Doc Ref. 7.11)** and **Outline OSWDS (Doc Ref. 7.14)** will minimise the potential for the discharge and vertical migration of leached and mobile contaminants from leakages or spills to the Alluvium superficial deposits (low sensitivity receptors) underlying the Site (low magnitude of impact). Therefore, the significance of effect is **Negligible** (not significant).

*Atherfield and Weald Clay Formations - Unproductive Aquifers*

11.8.25 The inclusion of the embedded mitigation measures as detailed in the **Outline OMP (Doc Ref. 7.11)** and **Outline OSWDS (Doc Ref. 7.14)** will minimise the potential for the discharge and vertical migration of leached and mobile contaminants from leakages or spills to the Atherfield and Weald Clay Formations (very low sensitivity receptors) underlying the Site (low magnitude of impact). Therefore, the significance of effect is **Negligible** (not significant).

Controlled Waters – Surface Waters (East Stour River)

11.8.26 The inclusion of the embedded mitigation measures as detailed in the **Outline OMP (Doc Ref. 7.11)** and **Outline OSWDS (Doc Ref. 7.14)** will reduce the likelihood of contaminated surface water run-off and the migration of leached and mobile contaminants from leakages or spills into the surface water features such as the East Stour River (moderate sensitivity receptors) present across and in the vicinity of the Site (low magnitude of impact). Therefore, the significance of effect is **Minor adverse** (not significant).

Ecosystem

11.8.27 The inclusion of the embedded mitigation measures as detailed in the **Outline OMP (Doc Ref. 7.11)** and **Outline OSWDS (Doc Ref. 7.14)** will reduce the likelihood of contamination to ground affecting the local ecosystem (very low sensitivity receptors) across the Site (negligible magnitude of impact). Therefore, the significance of effect is **Negligible** (not significant).

Built Environment

11.8.28 The built environment receptors as part of the Project include but are not limited to the shallow-piled founded PV panels, the Inverter Stations, Intermediate Substations, Project Substation, cables, and the Sellindge Substation. As such, there are limited areas for potential accumulation of ground gases, and limited sub-surface concrete structures that may be affected by aggressive ground conditions proposed as part of the Project.

11.8.29 As part of the **Outline CEMP (Doc Ref. 7.8)** the provision of ground gas protections measures have been detailed and will be installed across areas or structures deemed as at-risk. Additionally, embedded measures include specifying the concrete design class to be used for sub-surface structures in order to be suitably resistant to the ground conditions across the Site. These measures reduce the potential for contamination and ground gas (negligible magnitude of impact) posing a risk to the built environment (low sensitivity receptor). Therefore, the significance of effect is **Negligible** (not significant).

**Decommissioning Phase**

Human Health – Decommissioning Workers

11.8.30 The inclusion of the embedded mitigation measures as detailed in the **Outline DEMP (Doc Ref. 7.12)**, including appropriate PPE and a watching brief during earthworks, will reduce the potential of exposure to decommissioning workers

(moderate sensitivity receptors) from the risks of inhalation, ingestion, and dermal contact of potentially contaminated materials and ground gas (negligible magnitude of impact). Therefore, the significance of effect is **Negligible** (not significant).

### Human Health – Adjacent Site Users

11.8.31 The inclusion of the embedded mitigation measures as detailed in the **Outline DEMP (Doc Ref. 7.12)** will reduce the exposure levels to adjacent site users (moderate sensitivity receptors) from the risks of inhalation and ingestion of potentially air-borne contaminated materials and thereby reduce the magnitude of impact to negligible. Therefore, the significance of effect is **Negligible** (not significant).

### Controlled Waters - Groundwaters

#### *Principal Aquifer - (Hythe Formation)*

11.8.32 The inclusion of the embedded mitigation measures as detailed in the **Outline DEMP (Doc Ref. 7.12)** will reduce the likelihood of the vertical migration of leached and mobile contaminants from leakages or spills from decommissioning plant and equipment to the Hythe Formation principal groundwater aquifer (moderate sensitivity receptor) underlying the Site (low magnitude of impact). Therefore, the significance of effect is **Minor adverse** (not significant).

#### *Secondary A Aquifer - (Alluvium Superficial Deposits)*

11.8.33 The inclusion of the embedded mitigation measures as detailed in the **Outline DEMP (Doc Ref. 7.12)** will reduce the likelihood of the vertical migration of leached and mobile contaminants from leakages or spills from decommissioning plant and equipment to the Alluvium superficial Secondary A groundwater aquifer (low sensitivity receptor) underlying the Site (low magnitude of impact). Therefore, the significance of effect is **Negligible** (not significant).

#### *Unproductive Aquifer - (Atherfield and Weald Clay Formation)*

11.8.34 The inclusion of the embedded mitigation measures as detailed in the **Outline DEMP (Doc Ref. 7.12)** will reduce the likelihood of the vertical migration of leached and mobile contaminants from leakages or spills from decommissioning plant and equipment to the Atherfield and Weald Clay Formations unproductive groundwater aquifers (very low sensitivity receptors) underlying the Site (low magnitude of impact). Therefore, the significance of effect is **Negligible** (not significant).

### Controlled Waters - Surface Waters (East Stour River)

11.8.35 The inclusion of the embedded mitigation measures as detailed in the **Outline DEMP (Doc Ref. 7.12)** will reduce the likelihood of the migration of contaminated surface water run-off and any leached and mobile contaminants from leakages or spills into the surface water features (e.g. East Stour River) (moderate sensitivity receptors) present across and in the vicinity of the Site (low magnitude of impact). Therefore, the significance of effect is **Minor Adverse** (Not Significant).

### Ecosystem

11.8.36 The inclusion of the embedded mitigation measures as detailed in the **Outline DEMP (Doc Ref. 7.12)** will reduce the likelihood of contamination to ground affecting the local ecosystem (very low sensitivity receptors) across the Site (negligible magnitude of impact). Therefore, the significance of effect is **Negligible** (not significant).

## 11.9 Additional Mitigation, Monitoring and Enhancement Measures

11.9.1 No additional mitigation has been proposed as no significant effects have been identified at the construction, operational or decommissioning stages.

## 11.10 Residual Effects

11.10.1 As no additional mitigation measures have been proposed the residual significance of effects remains as Minor Adverse or Negligible (not significant). A summary of residual effects is provided in **Table 11.9**.

## 11.11 Cumulative Effects

11.11.1 Cumulative effects have been considered in terms of the accumulated effects of the Project with separate schemes proposed in the local area (inter-project cumulative effects).

11.11.2 The schemes of substantive development identified within 250m of the Project to be considered as part of the cumulative land contamination effect assessment, as outlined within **Section 11.4** of this Chapter, are as follows:

- ID No. 3: Pivot Power Battery Storage;
- ID No. 4: Walsh Power Condenser Project; and
- ID No. 9: East Stour Solar Farm.

11.11.3 It is considered that most likely inter-project cumulative effects of the Project and the schemes listed above in relation to land contamination result from the construction phases and could potentially occur through an increase in the mobilisation of contaminants in the air, ground and groundwater through the disturbance of a larger area of potentially contaminated ground mobilising contaminants.

### ID No. 3 Pivot Power Battery Storage

11.11.4 Pivot Power Battery Storage facility application has been granted subject to conditions[47] including the provision of a CEMP and DEMP. The scheme has been granted based upon a permitted 30-year operational lifespan, and it is therefore considered that there will be temporal overlap of operational phases of this scheme and the Project.

### ID No. 9 East Stour Solar Farm

11.11.5 The planning application has been refused, however it is still included in this assessment on a worst-case basis as the period during which an appeal could be brought has not yet expired. Prior to its refusal, a series of specific groundwater and contaminated land planning conditions had been recommended by the Environment Agency. If the appeal is successful and the scheme does go ahead, it is considered that this scheme will have temporal overlap with the Project during operational phases. To discharge the conditions, it will need to be demonstrated that appropriate pollution prevention measures have been incorporated into the scheme design and that appropriate additional mitigation measures are in place during its construction phase, as detailed in the East Stour Solar Farm scheme's ES[48].

### ID No. 4 Walsh Power Condenser Project

11.11.6 The scheme's planning application has been granted subject to conditions[49] including the provision of a CEMP and DEMP, as well as detailed surface water management strategy.

### Construction Phase

11.11.7 Appropriate pollution prevention measures are expected to be detailed in all the cumulative scheme's CEMPs which would reduce any potential significant effects to Minor Adverse and Not Significant to human health, ecosystem, built environment and controlled water receptors. These measures and use of best industry practice during the construction phase, as implemented via the CEMPs, are expected to prevent pollution originating from the schemes and entering the land and water environments preventing the wide-spread migration of any contamination as well as minimising the risk posed to sensitive receptors. The mitigation measures detailed in the **Outline CEMP (Doc Ref. 7.8)** for the Project have been designed to ensure a similar level of protection to identified sensitive receptors and prevent the potential for off-site migration of contamination. It is considered that there is very low likelihood of interaction between the cumulative schemes and the Project in relation to potential land contamination and therefore no significant cumulative effects are anticipated.

### Operational Phase

11.11.8 The pollution prevention measures put in place for the construction phase of the cumulative schemes, as outlined above, are expected to be implemented during the operational phase in line with industry practice and would reduce any potential significant effects to Minor Adverse and Not Significant to human health, ecosystem, built environment and controlled water receptors. The mitigation measures detailed in the **Outline OMP (Doc Ref. 7.11)** for the Project have been designed to ensure a similar level of protection to identified sensitive receptors and prevent the potential for off-site migration of contamination. It is considered that there is very low likelihood of interaction between the cumulative schemes and the Project in relation to potential land contamination during operational phases and therefore no significant cumulative effects are anticipated.

### Decommissioning Phase

11.11.9 Appropriate pollution prevention measures are expected to be detailed in all the cumulative scheme's DEMPs which would reduce any potential significant effects to Minor Adverse and Not Significant to human health, ecosystem, built environment and controlled water receptors. These measures and use of best industry practice during the construction phase, as implemented via the DEMPs, are expected to prevent pollution originating from the schemes and entering the land and water environments preventing the wide-spread migration of any contamination as well as minimising the risk posed to sensitive receptors. The mitigation measures detailed in the **Outline DEMP (Doc Ref. 7.12)** for the Project have been designed to ensure a similar level of protection to identified sensitive receptors and prevent the potential for off-site migration of contamination. It is considered that there is very low likelihood of interaction between the cumulative schemes and the Project in relation to potential land contamination and therefore no significant cumulative effects are anticipated.

### Mitigation and Residual Effects

11.11.10 No additional mitigation measures have been recommended to reduce cumulative effects and as such as the residual significance of effects remains as stated above.

Table 11.9: Summary of Residual Effects

| Receptor (Sensitivity) | Description of Impact | Significance of Effect without additional mitigation | Additional Mitigation/ Enhancement measure | Residual effect after mitigation |
|---|---|---|---|---|
| *Construction Phase* | | | | |
| Human Health – Construction Workers (High sensitivity receptor) | Exposure of contaminated land to construction workers: Inhalation, ingestion, and dermal contact of potentially contaminated material, and ground gas present across the Site. | Minor Adverse (Not Significant) | N/A | Minor Adverse (Not Significant) |
| Human Health – Adjacent Site Users (Moderate sensitivity receptor) | Exposure of contaminated land to adjacent site users: Inhalation and ingestion of air borne contaminated material/dust generated during earthworks. | Negligible (Not Significant) | N/A | Negligible (Not Significant) |
| Controlled Waters - Principal Groundwater Aquifer (Hythe Formation) (Moderate sensitivity receptor) | Exposure of groundwater aquifer present beneath the Site from the vertical migration of leached contaminants and mobile contaminants originating from leakages or spills. | Minor Adverse (Not Significant) | N/A | Minor Adverse (Not Significant) |
| Controlled Waters - Secondary A Groundwater Aquifer (Alluvium Superficial Deposits) (Low sensitivity receptor) | Exposure of groundwater aquifer present beneath the Site from the vertical migration of leached contaminants and mobile contaminants originating from leakages or spills. | Negligible (Not Significant) | N/A | Negligible (Not Significant) |

| Receptor (Sensitivity) | Description of Impact | Significance of Effect without additional mitigation | Additional Mitigation/ Enhancement measure | Residual effect after mitigation |
|---|---|---|---|---|
| Controlled Waters – Unproductive Groundwater Aquifers (Atherfield and Weald Clay Formation) (Very low sensitivity receptor) | Exposure of groundwater aquifers present beneath the Site from the vertical migration of leached contaminants and mobile contaminants originating from leakages or spills. | Negligible (Not Significant) | N/A | Negligible (Not Significant) |
| Controlled Waters – East Stour River, and on-Site streams and land drains (Moderate sensitivity receptor) | Exposure of the East Stour River and relevant surface water features to leached contaminants and mobile contaminants originating from leakages or spills to enter the controlled water receptors (surface waters). | Minor Adverse (Not Significant) | N/A | Minor Adverse (Not Significant) |
| Ecosystem – Non environmentally designated area (Very low sensitivity receptor) | Potential spillage and leakage of leached and mobile contaminants to ground. | Negligible (Not Significant) | N/A | Negligible (Not Significant) |
| *Operational Phase* | | | | |
| Human Health – Maintenance Workers | Exposure of contaminated land to maintenance workers: Inhalation, ingestion, and dermal contact of | Negligible (Not Significant) | N/A | Negligible (Not Significant) |

| Receptor (Sensitivity) | Description of Impact | Significance of Effect without additional mitigation | Additional Mitigation/ Enhancement measure | Residual effect after mitigation |
|---|---|---|---|---|
| (Moderate sensitivity receptor) | potentially contaminated material, and ground gas present across the Site. | | | |
| Human Health – Adjacent Site Users<br>(Moderate sensitivity receptor) | Exposure of contaminated land to adjacent site users: Inhalation and ingestion of air borne contaminated material/dust generated during limited operational earthworks. | Negligible<br>(Not Significant) | N/A | Negligible<br>(Not Significant) |
| Controlled Waters - Principal Groundwater Aquifer (Hythe Formation)<br>(Moderate sensitivity receptor) | Exposure of groundwater aquifers present beneath the Site from the vertical migration of leached contaminants and mobile contaminants originating from leakages or spills. | Minor Adverse (Not Significant) | N/A | Minor Adverse<br>(Not Significant) |
| Controlled Waters - Secondary A Groundwater Aquifer (Alluvium Superficial Deposits)<br>(Low sensitivity receptor) | Exposure of groundwater aquifers present beneath the Site from the vertical migration of leached contaminants and mobile contaminants originating from leakages or spills. | Negligible<br>(Not Significant) | N/A | Negligible<br>(Not Significant) |
| Controlled Waters – Unproductive Groundwater Aquifers (Atherfield and Weald Clay Formation)<br>(Very low sensitivity receptor) | Exposure of groundwater aquifers present beneath the Site from the vertical migration of leached contaminants and mobile contaminants originating from leakages or spills. | Negligible<br>(Not Significant) | N/A | Negligible<br>(Not Significant) |

| Receptor (Sensitivity) | Description of Impact | Significance of Effect without additional mitigation | Additional Mitigation/ Enhancement measure | Residual effect after mitigation |
|---|---|---|---|---|
| Controlled Waters – East Stour River, and on-Site streams and land drains (Moderate sensitivity receptor) | Exposure of the East Stour River and relevant surface water features to leached contaminants and mobile contaminants originating from leakages or spills to enter the controlled water receptors (surface waters). | Minor Adverse (Not Significant) | N/A | Minor Adverse (Not Significant) |
| Ecosystem – Non environmentally designated area (Very low sensitivity receptor) | Potential spillage and leakage of leached and mobile contaminants to ground. | Negligible (Not Significant) | N/A | Negligible (Not Significant) |
| Built Environment – PV panels and infrastructure (Low sensitivity receptor) | Accumulation of ground gasses within structures and chemical attack on sub-surface concrete structures due to aggressive ground conditions. | Negligible (Not Significant) | N/A | Negligible (Not Significant) |
| *Decommissioning Phase* | | | | |
| Human Health – Decommissioning Workers (Moderate Sensitivity receptor) | Exposure of contaminated land to decommissioning workers: Inhalation, ingestion, and dermal contact of potentially contaminated material, and ground gas present across the Site. | Negligible (Not Significant) | N/A | Negligible (Not Significant) |

| Receptor (Sensitivity) | Description of Impact | Significance of Effect without additional mitigation | Additional Mitigation/ Enhancement measure | Residual effect after mitigation |
|---|---|---|---|---|
| Human Health – Adjacent Site Users (Moderate Sensitivity receptor) | Exposure of contaminated land to adjacent site users: Inhalation and ingestion of air borne contaminated material/dust generated during earthworks. | Negligible (Not Significant) | N/A | Negligible (Not Significant) |
| Controlled Waters - Principal Groundwater Aquifer (Hythe Formation) (Moderate sensitivity receptor) | Exposure of groundwater aquifers present beneath the Site from the vertical migration of leached contaminants and mobile contaminants originating from leakages or spills. | Minor Adverse (Not Significant) | N/A | Minor Adverse (Not Significant) |
| Controlled Waters - Secondary A Groundwater Aquifer (Alluvium Superficial Deposits) (Low sensitivity receptor) | Exposure of groundwater aquifers present beneath the Site from the vertical migration of leached contaminants and mobile contaminants originating from leakages or spills. | Negligible (Not Significant) | N/A | Negligible (Not Significant) |
| Controlled Waters – Unproductive Groundwater Aquifers (Atherfield and Weald Clay Formation) (Very low sensitivity receptor) | Exposure of groundwater aquifers present beneath the Site from the vertical migration of leached contaminants and mobile contaminants originating from leakages or spills. | Negligible (Not Significant) | N/A | Negligible (Not Significant) |

| Receptor (Sensitivity) | Description of Impact | Significance of Effect without additional mitigation | Additional Mitigation/ Enhancement measure | Residual effect after mitigation |
|---|---|---|---|---|
| Controlled Waters – East Stour River, and on-Site streams and land drains (Moderate sensitivity receptor) | Exposure of the East Stour River and relevant surface water features to leached contaminants and mobile contaminants originating from leakages or spills to enter the controlled water receptors (surface waters). | Minor Adverse (Not Significant) | N/A | Minor Adverse (Not Significant) |
| Ecosystem – Non environmentally designated area (Very low sensitivity receptor) | Potential spillage and leakage of leached and mobile contaminants to ground. | Negligible (Not Significant) | N/A | Negligible (Not Significant) |

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