Springwell Solar Farm

Environmental Statement

Volume 1
Chapter 11: Land, Soil and Groundwater

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning
(Applications: Prescribed Forms
and Procedure) Regulations 2009

EN010149/APP/6.1
November 2024
Springwell Energyfarm Ltd

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11. Land, Soil and Groundwater

11.1. Introduction

11.1.1. This chapter presents an assessment of likely significant effects arising from the construction, operation (including maintenance) and decommissioning of the Proposed Development upon land, soil and groundwater. The full description of the Proposed Development is provided within **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]**.

11.1.2. This chapter is supported by the following figures presented in **ES Volume 2 [EN010149/APP/6.2]**:

- **Figure 11.1: Agricultural Land Classification**;
- **Figure 11.2: Agricultural Land Classification Overlay**; and
- **Figure 11.3: Soil Association Map**.

11.1.3. This chapter is supported by the following appendices presented in **ES Volume 3 [EN010149/APP/6.3]**:

- **Appendix 11.1A: Springwell West Agricultural Land Classification**;
- **Appendix 11.1B: Springwell East Agricultural Land Classification**;
- **Appendix 11.1C: Springwell Central Agricultural Land Classification**;
- **Appendix 11.2: Preliminary Risk Assessment**; and
- **Appendix 11.3: Detailed UXO Risk Assessment**.

11.1.4. This chapter should be read in conjunction with the following assessment chapters presented in **ES Volume 1 [EN010149/APP/6.1]**:

- **Chapter 15: Water**.

11.2. Legislative framework, planning policy and guidance

11.2.1. This assessment has been undertaken with regard to the following legislation, planning policy and guidance.

11.2.2. It should be noted that this chapter does not assess the compliance of the Proposed Development against relevant planning policy. Such an assessment is presented in the **Planning Statement [EN010149/APP/7.2]**.

Legislation

- Part IIA of the Environmental Protection Act 1990 provides a statutory regime for identifying and remediating contaminated land **[Ref. 11-1]**;
- The Water Resources Act 1991 covers the management and protection of water resources. It includes requirements to ensure sustainable use of water, prevent pollution and regulate activities that could affect availability or quality of water **[Ref. 11-2]**;
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 establishes a framework for action relating to water policy in England and Wales **[Ref. 11-3]**;
- The Groundwater (Water Framework Directive) (England) Direction 2016 sets out obligations to protect groundwater **[Ref. 11-4]**;
- Directive 2013/39/EC regarding priority substances in the field of water policy, and provides information on environmental quality standards for water **[Ref. 11-5]**; and
- The Environmental Permitting (England and Wales) Regulations 2016, provide a structure for overseeing activities which have the potential to harm human health or the environment **[Ref. 11-6]**.

National Planning Policy

- Overarching National Policy Statement for Energy (NPS EN-1) (2023) – Section 5.11 relates to land use and includes details of planning policy relating to land contamination, soil and agricultural land **[Ref. 11-7]**;
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023) – Section 2.10 considers issues relating to soil quality for solar development, including the consideration of land types on which schemes could be developed **[Ref. 11-8]**;
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023) - details issues relating to underground cables, in connection with soil and contamination, although predominantly dealing with overhead cables **[Ref. 11-9]**; and
- National Planning Policy Framework (NPPF) (2023) with reference to Section 15 ‘Conserving and enhancing the natural environment’ **[Ref. 11-10].** Consultation on the proposed reform to the NPPF ended on the 24 September 2024. **The Planning Statement [EN010149/APP/7.2]** considers both the current and consulted NPPF.

Local Planning Policy

- Central Lincolnshire Local Plan (2018-2040) adopted 13 April 2023, including Policy S14: Renewable Energy; Policy 56: Development on land affected by contamination; Policy S67: Best and Most Versatile

Land; and Policy S60: Protecting biodiversity and geodiversity **[Ref. 11-11]**; and

- Lincolnshire Minerals and Waste Local Plan, Core Strategy and Development Management Policies (2016), of particular interest, Policy M11: Safeguarding of mineral resources **[Ref. 11-12]**.

Guidance

- Department for Food, Environment and Rural Affairs (Defra) Local Lands, Soils and Groundwater Management Technical Guidance (TG22) **[Ref. 11-13]**;
- A Green Future: Our 25 Year Plan to Improve the Environment **[Ref. 11-14]**;
- Land Contamination Risk Management (Environment Agency, 2023) **[Ref. 11-15]**;
- Ministry of Agriculture, Fisheries and Food (1988). Agricultural Land Classification for England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land **[Ref. 11-16]**;
- Institute of Environmental Management and Assessment (IEMA) Guide: A New perspective on Land and Soil in Environmental Impact Assessment (2022) **[Ref. 11-17];**
- Technical Information Note TIN049: Agricultural Land Classification: protecting the best and most versatile agricultural land, 2nd edition (2012) **[Ref. 11-18]**; and
- Likelihood of Best and Most Versatile Agricultural Land strategic scale maps (Natural England, 2017) **[Ref. 11-19]**.

11.3. Stakeholder engagement

11.3.1. **Table 11.1** provides a summary of the stakeholder engagement activities undertaken separately from the Environmental Impact Assessment (EIA) scoping, non-statutory consultation, statutory consultation and targeted consultation process in support of the preparation of this assessment, as well as detailing the matters raised, how such matters have been addressed, and where they have been addressed in the ES.

11.3.2. **ES Volume 3, Appendix 5.3: Scoping Opinion Response Matrix [EN010149/APP/6.3]** presents the responses received via the Scoping Opinion and the Applicant's response to each matter raised.

11.3.3. Appendix A-4, J-1, J-2 and K-3 of the **Consultation Report [EN010149/APP/5.1]**, which is submitted in support of the DCO Application, sets out the feedback received during non-statutory, statutory and targeted consultation and how regard has been afforded by the Applicant to each matter raised

Table 11.1 Summary of stakeholder engagement

Consultee	Date of engagement	Summary of matters raised	How this matter has been addressed	Location of where this matter is addressed in the ES
Natural England	11 September 2023	A meeting was held with Natural England to discuss the agricultural land classification survey and the consideration of Best and Most Versatile (BMV) land in the development of the design. Natural England requested for an agricultural land classification survey to be undertaken of the proposed cable route locations connecting each parcel to help inform the management requirements of the soil which will be documented within and secured by the **Outline Soil Management Plan (oSMP) [EN010149/APP/7.11]**.	A detailed agricultural land classification survey has been undertaken in order to assess agricultural classification within the Site, including all of the cable routes. This survey has informed the design development and the **oSMP [EN010149/APP/7.11]**, which is submitted in support of the DCO Application	**Paragraphs 11.5.19 to 11.5.32** of this chapter. **ES Volume 2, Figure 11.1: Agricultural Land Classification [EN010149/APP/6.2]** **oSMP [EN010149/APP/7.11]**
Natural England	3 May 2024	A meeting was held with Natural England to discuss the agricultural land classification survey outputs for the Grid Connection Corridor	Confirmation provided that the agricultural land classification survey has been undertaken for the Site, the results of which have	**Table 11.11** of this chapter.

Consultee	Date of engagement	Summary of matters raised	How this matter has been addressed	Location of where this matter is addressed in the ES
		and other cable routes that have been surveyed within the Site. The Applicant provided updates on the location of the Battery Energy Storage System (BESS) and Springwell Substation, and constraints to their locality were provided. Natural England requested for the ES to provide a detailed breakdown of the percentage of each agricultural land classification grade for each element of the infrastructure.	informed the placement of infrastructure. A detailed breakdown of each grade of soils for each element of infrastructure is provided within this chapter.	
North Kesteven District Council and Lincolnshire County Council	31 May 2024	A meeting was held with North Kesteven District Council and Landscope, who are acting on behalf of North Kesteven District Council and Lincolnshire County Council as their soils specialist, to discuss the agricultural land classification survey outputs.	**ES Volume 2, Figure 11.2: Agricultural Land Classification Overlay [EN010149/APP/6.2]** presents the agricultural land classification survey soil grading and location of infrastructure to show how the design of the Proposed Development has been	**ES Volume 2, Figure 11.1: Agricultural Land Classification [EN010149/APP/6.2]** **ES Volume 2, Figure 11.2: Agricultural Land**

Consultee	Date of engagement	Summary of matters raised	How this matter has been addressed	Location of where this matter is addressed in the ES
		The summary of the soil types across the Site and the survey results was discussed, alongside the approach to the design development and consideration towards BMV land. The feedback received on the Preliminary Environmental Information Report was discussed, which included particular reference to the production of a figure to show the agricultural land classification grades overlaid with the Zonal Masterplan and the approach to land taken out of agricultural use.	developed to consider BMV land. Further details on the reasonable alternatives that have been considered is provided in **ES Volume 1, Chapter 4: Reasonable Alternatives Considered [EN010149/APP/6.1]**. .	**Classification Overlay [EN010149/APP/6.2]** **Table 11.11** of this chapter. **ES Volume 1, Chapter 4: Reasonable Alternatives Considered [EN010149/APP/6.1]** **oSMP [EN010149/APP/7.11]**
North Kesteven District Council and Lincolnshire	June 2024	The Applicant has discussed the need to undertake a Mineral Safeguarding Assessment as part of the pre-application engagement and agreed that it will form an	**Appendix 2 Mineral Safeguarding Assessment** forms part of the **Planning Statement [EN010149/APP/7.2]** which has been submitted in support of the DCO Application.	**Table 11.3** of this chapter **Appendix 2** of the **Planning Statement [EN010149/APP/7.2]**

Consultee	Date of engagement	Summary of matters raised	How this matter has been addressed	Location of where this matter is addressed in the ES
County Council		appendix to the Planning Statement.	On the basis the Proposed Development has a lifespan of up to 40 years and due to the Proposed Development being decommissioned at the end of its operational life, any minerals would not be permanently sterilised and would be available to exploit if required at a future date. The minerals within the Order Limits will not be permanently sterilised, and post-decommissioning, the land could be worked for minerals. The Proposed Development is reservable by nature, and therefore there is not considered to be any conflict with the M11 mineral safeguarding policy.	

11.4. Approach to the assessment

Study area

11.4.1. The study area considered for the assessment has been based on professional judgement. A 1km search area is used as an indicative maximum when assessing information relating to the potential for land and soil related receptors to be impacted by the Proposed Development. The reason for this is that migration of contamination through leaching within soil, or migration of groundwater, would not be expected to travel over distances greater than 1km. The ground conditions (geological units, soil types, topography, presence of watercourses, etc) are all taken into account when determining whether features within the 1km search area require further consideration.

11.4.2. The study area for land, soil and groundwater related receptors that could be impacted during the construction, operation (including maintenance) and/or decommissioning phase is therefore up to 1km from the Order Limits.

Scope of the assessment

11.4.3. The scope of this assessment has been established throughout the EIA process and design of the Proposed Development. Further information can be found in **ES Volume 1, Chapter 5: Approach to the EIA [EN010149/APP/6.1]**.

11.4.4. This section provides an update to the scope of the assessment from that presented in the EIA Scoping Report which is located in **ES Volume 3, Appendix 5.1: Scoping Report [EN010149/APP/6.3]** and re-iterates/updates the evidence base for scoping matters in or out following further iterative assessment.

Receptors/matters scoped into the assessment

11.4.5. **Table 11.2** presents the receptors/matters that are scoped into the assessment reported within this ES, together with appropriate justification.

Table 11.2. Receptors/matters scoped into the assessment

Receptor/matter	Phase	Justification
Land contamination	Construction, operation (including	The ES is supported by the findings of **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]**. Where land contamination has been identified, this

Receptor/matter	Phase	Justification
	maintenance) and decommissioning	chapter has assessed the effects where they are likely to occur. Therefore, land contamination has been scoped into the assessment, as requested within the Scoping Opinion presented in **ES Volume 3, Appendix 5.2: Scoping Opinion [EN010149/APP/6.3]**.
Groundwater	Construction, operation (including maintenance) and decommissioning	Part of the Site overlies a principal aquifer of high vulnerability. A small area of the Site adjacent to Scopwick (see **ES Volume 2, Figure 2.1: Environmental Considerations [EN010149/APP/6.2]**) is also located within Zone 1 of a Source Protection Zone (SPZ) for a groundwater abstraction well for a potable water supply borehole. Therefore, groundwater has been scoped into the assessment, as requested within the Scoping Opinion presented in **ES Volume 3, Appendix 5.2: Scoping Opinion [EN010149/APP/6.3]**.
Soil and agricultural land	Construction	The construction of the Proposed Development may result in impacts on the availability of BMV land, topsoil quality and changes to the hydrogeological regime and has the potential to damage agricultural field drains. Therefore, soil and agricultural land has been scoped into the assessment for the construction phase, as detailed within the Scoping Report presented in **ES Volume 3, Appendix 5.1: Scoping Report [EN010149/APP/6.3]** and confirmed within the Scoping Opinion presented in **ES Volume 3, Appendix 5.2: Scoping Opinion [EN010149/APP/6.3]**. Consideration of the hydrogeological regime is presented in **Section 11.5** of this chapter**.**

Receptor/matter	Phase	Justification
Agricultural land	Operation (including maintenance)	The Proposed Development will be partly located on BMV agricultural land, and will therefore impact the availability of BMV land during operation (including maintenance) of the Proposed Development. Therefore, agricultural land during operation (including maintenance) phase has been scoped into the assessment, as detailed in the Scoping Report presented in **ES Volume 3, Appendix 5.1: Scoping Report [EN010149/APP/6.3]** and confirmed within the Scoping Opinion presented in **ES Volume 3, Appendix 5.2: Scoping Opinion [EN010149/APP/6.3]**.
Agricultural land	Decommissioning	Solar panels and associated infrastructure will be removed during decommissioning. There is the potential that BMV could be affected if the works are not carried out correctly. Therefore, agricultural land during decommissioning has been scoped into the assessment to ensure that land is returned with the same agricultural land quality (or improved quality), as detailed in the EIA Scoping Report presented in **ES Volume 3, Appendix 5.1: Scoping Report [EN010149/APP/6.3]** and confirmed within the Scoping Opinion presented in **ES Volume 3, Appendix 5.2: Scoping Opinion [EN010149/APP/6.3]**.

Receptors/matters scoped out of the assessment

11.4.6. **Table 11.3** presents the receptors/matters that are scoped out of the assessment that are therefore not considered as part of this ES, together with appropriate justification.

Table 11.3 Receptors/matters scoped out of the assessment

Receptor/matter	Phase	Justification
Soil	Operation (including maintenance)	The potential for vehicle movements to cause compaction during operation is considered limited. Therefore, soil (impacts from compaction) during operation (including maintenance) has been scoped out of the assessment, as detailed within the EIA Scoping Report presented in **ES Volume 3, Appendix 5.1: Scoping Report [EN010149/APP/6.3]** and confirmed within the Scoping Opinion presented in **ES Volume 3, Appendix 5.2: Scoping Opinion [EN010149/APP/6.3]**. It is not anticipated that there will be any significant changes to the hydrogeological regime as a result of the operational Proposed Development and no impacts affecting the quality of soil within the Site are anticipated.
Soil	Decommissioning	Any effects on soil during decommissioning are not expected to be significant as the number of vehicle movements is anticipated to be less than during the construction phase, limiting the potential for compaction of soil to occur. Therefore, soil during decommissioning has been scoped out from the assessment, as detailed within the EIA Scoping Report presented in **ES Volume 3, Appendix 5.1: Scoping Report [EN010149/APP/6.3]** and confirmed within the Scoping Opinion presented in **ES Volume 3, Appendix 5.2: Scoping Opinion [EN010149/APP/6.3]**.
Mineral assessment	Construction, operation (including	A Minerals Safeguarding Assessment forms part of the **Planning Statement [EN010149/APP/7.2]** which is

Receptor/matter	Phase	Justification
	maintenance) and decommissioning	submitted in support of the DCO and therefore a further assessment of minerals are not considered or included in this chapter.
Mineral extraction	Construction, operation (including maintenance) and decommissioning	Borrow pits no longer form part of the Proposed Development.
Unexploded Ordnance	Construction, operation (including maintenance) and decommissioning	Unexploded Ordnance during construction has been scoped out of the assessment, as detailed in the EIA Scoping Report presented in **ES Volume 3, Appendix 5.1: Scoping Report [EN010149/APP/6.3]**. A Detailed Unexploded Ordnance (UXO) Risk Assessment has been undertaken for the Site, as detailed in **ES Volume 3, Appendix 11.3 [EN010149/APP/6.3]** and deemed the majority of the Site as being at a low risk from items of Allied UXO. The risk of UXO will be managed by the implementation of a UXO Risk Management Plan for intrusive works and site-specific awareness briefings, alongside attendance by a UXO specialist and on-site support for intrusive works in areas of medium risk. This is secured within the **Outline Construction Environment Management Plan (oCEMP) [EN010149/APP/7.7]**.

Establishing baseline conditions

Agricultural classification

11.4.7. The agricultural land classification system (Ministry of Agricultural Food and Fisheries, 1988) **[Ref. 11-16]** classifies land into five grades numbered 1 to 5, with grade 3 divided into two subgrades (3a and 3b). The agricultural land classification system provides a framework for

classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use for food production. The limitations can operate in one or more of four principal ways; they may affect the range of crops which can be grown, the level of crop yield, the consistency of crop yield, and the cost of obtaining a crop. The classification system gives considerable weight to flexibility of cropping, whether actual or potential. However, the ability of some land to produce consistently high yields of a narrower range of crops is also considered.

Land contamination

11.4.8. In order to assess the potential for land contamination, a Preliminary Risk Assessment was undertaken during 2022 in accordance with Land Contamination Risk Management guidance **[Ref. 11-15]**. The assessment comprised a desk-based review of information published online, the purchase of an environmental data base report, and a site reconnaissance survey. The Preliminary Risk Assessment is provided in **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]**.

Data sources to inform the EIA baseline characterisation

11.4.9. The following data sources have been used to understand the existing lands, soil and groundwater baseline conditions:

- MAGIC map – online interactive maps providing environmental mapping data from partners including: Defra, Historic England, Natural England, Environment Agency, Forestry Commission and Marine Management Organisation **[Ref. 11-20]**;
- British Geological Survey – Geology of Britain online viewer website which provides geological mapping data and copies of scanned historical borehole logs (where available) **[Ref. 11-21]**;
- Agricultural Land Classification Map East Midlands Region (ALC005) **[Ref. 11-22];**
- Environmental database report provided by Envirocheck **[Ref. 11-23]**;
- Environment Agency data on Groundwater Source Protection Zones **[Ref. 11-24]**; and
- Detailed unexploded ordnance risk assessment report, as presented within **ES Volume 3, Appendix 11.3: Detailed UXO Risk Assessment [EN010149/APP/6.3]**.

Site visits/surveys

11.4.10. The following site visits/surveys have been undertaken to understand the existing land, soil and groundwater baseline conditions:

- A Site visit was carried out to inform the Preliminary Risk Assessment produced in 2022, to assess potential land contamination sources and geotechnical constraints to the Proposed Development. Further detail is included in **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]**.
- Agricultural land classification surveys were carried out between March 2022 and October 2024, covering the land within the Order Limits. The surveys used a combination of records published online, and intrusive investigatory works in order to grade the agricultural land. The grading was performed in accordance with the agricultural land classification system as per the Ministry of Agricultural Food and Fisheries guidance, 1988 **[Ref. 11-16].** The survey was based on observations at intersects of a 200m grid, giving a sampling density of one observation per four hectares. Later, further observations were conducted at 100m spacing, giving a final sample density of one per hectare. The survey was undertaken in line with the Natural England 'Technical Information Note TIN049: Agricultural Land Classification: protecting the best and most versatile land', 2nd edition (2012) **[Ref. 11-18]**. During the survey, soils were examined via a combination of auger borings and soil description pits to a maximum depth of 1.2m. A number of mini pits were also dug ad hoc to confirm soil and stone content, from which it has been possible to map the distribution of land quality and soil types. The survey covered the underground cable routes as well as the Grid Connection Corridor. The results of the surveys are split into three reports comprising Springwell West (including the Grid Connection Corridor), Springwell East and Springwell Central which are presented in **ES Volume 3, Appendix 11.1A: Springwell West Agricultural Land Classification, Appendix 11.1B: Springwell East Agricultural Land Classification and Appendix 11.1C: Springwell Central Agricultural Land Classification [EN010149/APP/6.3].**

Approach to design flexibility

11.4.11. The Project Parameters, as outlined in **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]**, **ES Volume 3, Appendix 3.1: Project Parameters [EN010149/APP/6.3]** and the parameter plans presented in **ES Volume 2, Figures 3.1 – 3.4 [EN010149/APP/6.2]**, set out the reasonable 'worst-case' parameters for the Proposed Development.

11.4.12. **ES Volume 1, Chapter 5: Approach to the EIA [EN010149/APP/6.1]** sets out those elements of the Proposed Development for which optionality is present within the design. The reasonable 'worst-case' scenario that has been assessed in this traffic and transport chapter for each element of the Proposed Development where optionality is present within the design is outlined within **Table 11.4**.

Table 11.4 Reasonable worst-case assessed for land, soil and groundwater

Project element	Reasonable worst-case scenario that has been assessed
BESS Springwell Substation and Main Collector Compound	This assessment has considered the maximum parameters for the location of the BESS, Springwell Substation and Main Collector Compound as outlined in **ES Volume 2, Figure 3.1: Zonal Masterplan [EN010149/APP/6.2]**, to ensure a worst-case has been assessed.
Balance of Solar System (BoSS) – Inverters	The inverters which form part of the BoSS would comprise either string inverters which are placed underneath the Solar PV modules or central inverters which are sited at regular intervals amongst the Solar PV modules. A hybrid option of both types is embedded into the design and considered for the assessment. The detailed list of each field and inverter type is detailed in **ES Volume 3, Appendix 3.1: Project Parameters [EN010149/APP/6.3]** and will be secured by the **Design Commitments [EN010149/APP/7.4].**
Construction Compounds	This assessment has considered the maximum parameters for the location of the construction compounds as identified in **ES Volume 2, Figure 3.10: Primary and Secondary Construction Compounds [EN010149/APP/6.2]**.
Satellite Collector Compounds	This assessment has considered the maximum parameters for the location of the Satellite Collector Compounds as outlined in **ES Volume 2, Figure 3.1: Zonal Masterplan [EN010149/APP/6.2]**, to ensure a worst-case has been assessed.
Cable routes and access tracks	This assessment has considered the indicative cable route as presented in **ES Volume 2, Figure 3.9: Indicative Cable Crossing [EN010149/APP/6.2]** and access tracks as presented in **ES Volume 2, Figure 3.14: Indicative Location of Internal Access Tracks [EN010149/APP/6.2]**.
Depth of foundations	The depth of foundations for Solar PV modules would be 1.5m to 3m, depending on ground conditions. This assessment assumes that the foundation depth would be 3m as this is considered the reasonable worst-case.

Assessment assumptions

11.4.13. **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]** details the preliminary design principles of the Proposed Development components, as they are currently known.

Assessment methodology and criteria

11.4.14. The assessment criteria for land, soil and groundwater adopted for this assessment are detailed below. It should be noted that these criteria differ from the criteria proposed within **ES Volume 3, Appendix 5.1: Scoping Report (see Appendix D) [EN010149/APP/6.3]** with an updated approach that provides additional robustness in terms of assessing the potential effects relating to land, soil and groundwater The updated criteria was also used for the purposes of the Preliminary Environmental Information Report.

Preliminary risk assessment

11.4.15. For **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]**, a desk-based assessment was completed in accordance with relevant British Standards and authoritative technical guidance. The assessment of the contamination status of land within the Order Limits is in line with the technical approach presented in Land Contamination Risk Management **[Ref. 11-15]**. The scope of works included:

- review of the history of development on the Site and surroundings;
- assessment of local geology, hydrogeology and hydrology;
- review of relevant information held by appropriate statutory authorities;
- review of any previous site investigation reports made available;
- completion of a site reconnaissance survey (20 and 21 October 2022) to assess the visual condition of the Site;
- development of an initial Conceptual Site Model;
- preliminary consideration of geotechnical constraints and hazards; and
- identification of the need for further action, e.g. intrusive investigations.

11.4.16. The assessment of contaminated land is based on the development of a Conceptual Site Model. This approach identifies sources, pathways and receptors at a site and assesses the potential for a link to exist between a source of contamination and a receptor which may then constitute a risk:

- Source: this is the identification of a specific source of contamination that is located on- or off-site.

- Pathway: this is the means by which the contaminant could migrate through the environment to reach a receptor.
- Receptor: can be property, humans, and the environment (e.g., controlled waters/ecology) which could be affected by contamination.

Receptor sensitivity for land and soil

11.4.17. Sensitivity criteria for land and soil, derived from the IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment **[Ref. 11-17]** are defined in **Table 11.5**.

Table 11.5 Land and soil receptor sensitivity

Sensitivity (in-situ soil)	Soil resource
Very High	**Biomass production**: Agricultural land classification Grades 1 & 2 or Land Capability for Agriculture Classes 1 & 2. **Ecological habitat, soil biodiversity and platform for landscape**: Soils supporting protected features within a European site (e.g., Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar); Peat soils; Soils supporting a National Park, or Ancient Woodland. **Soil carbon**: Peat soils. Soils with potential for ecological/landscape restoration. **Soil hydrology**: Very important catchment pathway for water flows and flood risk management. **Archaeology, cultural heritage, community benefits and geodiversity**: Scheduled Ancient Monuments (SAMs) and adjacent areas; World Heritage and European designated sites; soils with known archaeological interest; soils supporting community/recreational/educational access to land covered by National Park designation. **Source of materials**: Important surface mineral reserves that would be sterilised (i.e., without future access).
High	**Biomass production**: Agricultural land classification Grade 3a, or Land Capability for Agriculture Grade 3.1. **Ecological habitat, soil biodiversity and platform for landscape**: Soils supporting protected features within a UK designated site (e.g., UNESCO Geoparks, Sites of Special Scientific Interest (SSSI) or Areas of Outstanding Natural Beauty (now National Landscapes), Special Landscape Area, and Geological Conservation Review sites); Native Forest and woodland soils; Unaltered soils supporting semi-natural vegetation (including UKBAP Priority habitats).

Sensitivity (in-situ soil)	Soil resource
	Soil carbon: Organo-mineral soils (e.g., peaty soils). **Soil hydrology**: Important catchment pathway for water flows and flood risk management. **Archaeology, cultural heritage, community benefits and geodiversity**: Soils with probable but as yet unproven (prior to being revealed by construction) archaeological interest; historic parks and gardens; Regionally Important Geological and Geomorphological Sites (RIGS); Soils supporting community /recreational/educational access to RIGS and AONBs. **Source of materials**: Surface mineral reserves that would be sterilised (i.e. without future access).
Medium	**Biomass production**: Agricultural land classification Grade 3b or Land Capability for Agriculture Grade 3.2. **Ecological habitat, soil biodiversity and platform for landscape**: Soils supporting protected or valued features within non-statutory designated sites (e.g., Local Nature Reserves (LNR), Local Geological Sites (LGSs), Sites of Nature Conservation Importance (SNCIs), Special Landscape Areas; Non-Native Forest and woodland soils **Soil carbon**: Mineral soils. **Soil hydrology**: Important minor catchment pathway for water flows and flood risk management. **Archaeology, cultural heritage, community benefits and geodiversity**: Soils with possible but as yet unproven (prior to being revealed by construction) archaeological interest; soils supporting community/recreational/educational access to land. **Source of materials**: surface mineral reserves that would remain accessible for extraction.
Low	**Biomass production**: Agricultural land classification Grades 4 & 5 or Land Capability for Agriculture Grades 4.1 to 7 or urban soils. **Ecological habitat, soil biodiversity and platform for landscape:** Soils supporting valued features within non-designated notable or priority habitats/landscapes. Agricultural soils. **Soil carbon**: Mineral soils. **Soil hydrology**: Pathway for local water flows and flood risk management. **Archaeology, cultural heritage, community benefits and geodiversity**: Soils supporting no notable cultural heritage, geodiversity nor community benefits; soils supporting limited community/recreational/ educational access to land.

Sensitivity (in-situ soil)	Soil resource
	Source of materials: Surface mineral reserves that would remain accessible for extraction.
Negligible	As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions.

Receptor sensitivity for groundwater

11.4.18. Sensitivity criteria for groundwater, derived from professional judgement, are defined in **Table 11.6**.

Table 11.6 Groundwater receptor sensitivity

Sensitivity	Criteria guide
High	The receptor has low ability to absorb change without fundamentally altering its present character and is of high environmental value or of national importance. In terms of hydrological receptors, this relates to: Principal aquifers (within Groundwater Source Protection Zone).
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character and has some environmental value or is of regional importance. In terms of hydrological receptors this relates to: • Principal aquifers (outside of Groundwater Source Protection Zone) and • Secondary (A, B or undifferentiated) aquifers (within Groundwater Source Protection Zone).
Low	The receptor is tolerant of change without detriment to its character and is of low environmental value or local importance. In terms of hydrological receptors this relates to: • Secondary (A, B or undifferentiated) aquifers (outside of Groundwater Source Protection Zone) and • Non-designated aquifers.

Magnitude of impact for land and soil

11.4.19. Where an impact is considered to be present, the magnitude of the impact is classified using the criteria presented in **Table 11.7** below, which is derived from the IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment **[Ref. 11-17]**.

Table 11.7 Land and soil magnitude of impact

Magnitude of impact (change)	Description of impacts restricting proposed land use
Major	Permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading), over an area of more than 20ha or loss of soil-related features (including effects from 'temporary developments'*); or Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of more than 20 ha, or gain in soil-related features (including effects from 'temporary developments'*).
Moderate	Permanent, irreversible loss of one or more soil functions or soil volumes, over an area of between 5 and 20 ha or loss of soil-related features (including effects from 'Temporary Developments'*); or Potential for improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of between 5 and 20 ha, or gain in soil-related features.
Minor	Permanent, irreversible loss of less than 5 ha or a temporary, reversible loss of one or more soil functions or soil volumes, or temporary, reversible loss of soil-related features; or Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of less than 5 ha or a temporary improvement in one or more soil functions due to remediation or restoration or off-site improvement, or temporary gain in soil-related features.
Negligible	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.
No change	No change from baseline conditions

* *Temporary developments can result in a permanent impact if resulting disturbance or land use change causes permanent damage to soil.*

Magnitude of impact for groundwater

11.4.20. Where an impact is considered to be present, the magnitude of the impact is classified using the criteria presented in **Table 11.8** below, which are derived from professional judgement.

Table 11.8 Groundwater magnitude of impact

Magnitude of impact	Criteria guide
High	Total loss or major alteration to key elements or features of the baseline conditions to the extent that post-development character or composition of baseline conditions will be fundamentally changed.
Medium	Loss or alteration to one or more key elements or features of the baseline conditions to the extent that post-development character or composition of the baseline conditions will be materially changed.
Low	Minor shift away from baseline conditions. Changes arising will be detectable but not material; the underlying character or composition of the baseline conditions will be similar to the pre-development situation.
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximate to a 'no change' situation.
No change	No change from baseline conditions.

Significance of effect for land and soil

11.4.21. The significance of effect is based on the sensitivity of the receptor and the magnitude of impact, as outlined in **Table 11.9**, which is derived from the IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment **[Ref. 11-17]**. The significance of effect can be either adverse or beneficial.

11.4.22. The significance of an effect is reported as either 'significant' or 'not significant'. Any effects that have been determined as 'moderate' or above are considered to be significant. Any effects that have been determined as 'slight' or below are considered not significant. Where the significance matrix indicates a range for the effect significance (e.g. 'slight or moderate'), professional judgement can be applied to select one option (which would be justified by evidence, as appropriate) or an effect significance range can be applied. If a significance of effect is assigned as

'slight or moderate', this would be considered significant unless further information could be provided to downgrade the significance effect to 'slight'.

Table 11.9 Soil and agricultural land significance of effect criteria

Sensitivity	Magnitude of impact				
	No Change	Negligible	Minor	Moderate	Major
Negligible	Neutral	Neutral	Neutral	Neutral or Slight	Slight
Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
Very high	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large

Significance of effect for groundwater

11.4.23. The significance of effect is based on the sensitivity of the receptor and the magnitude of impact, as outlined in **Table 11.10**, derived from CIRIA's Contaminated Land Risk Assessment (A guide to good practice) **[Ref. 11-25]** and with reference to the IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment **[Ref. 11-17]**. The significance of effect can be either adverse or beneficial.

11.4.24. The significance of an effect is reported as either 'significant' or 'not significant'. Any effects that have been determined as 'moderate' or above are considered to be significant. Any effects that have been determined as 'low' or below are considered not significant. Where the significance matrix indicates a range for the effect significance (e.g. 'moderate/low'), professional judgement can be applied to select one option (which would be justified by evidence, as appropriate) or an effect significance range can be applied. If a significance of effect is assigned as 'moderate/low', this would be considered significant unless further information could be provided to downgrade the significance effect to 'low'.

Table 11.10 Significance of effect criteria relating to groundwater

Sensitivity	Magnitude of impact			
	Negligible	Low	Medium	High
Negligible	Very Low	Very Low	Very Low	Low
Low	Very Low	Very Low	Low	Moderate/Low
Medium	Very Low	Low	Moderate/Low	Moderate
High	Low	Moderate/ Low	Moderate	High

11.5. Environmental baseline

Existing baseline

Land and groundwater

11.5.1. This section summarises the findings of **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]** undertaken in 2022. The dataset was obtained from Envirocheck in 2022 **[Ref. 11-23]**.

11.5.2. The Site has largely remained undeveloped throughout its entire history, except for localised construction of minor structures, tracks, paths and access roads. Numerous stone pits, gravel pits and small quarries are shown to be distributed across the Site.

11.5.3. The Site is primarily covered by a nominal to limited thickness of topsoil, with any made ground anticipated to be localised to discrete previously developed areas, such as former small structures, roads and paths. Where features such as the RAF airfield and sewage works are located directly adjacent to the Site, if there are areas of made ground within those facilities, there is the potential for some made ground deposits to have encroached onto the Site.

11.5.4. As the Site covers a large area, the geological sequence is highly varied. Superficial deposits comprising tidal flat deposits are localised in the north of the Site. In the central and south-western parts of the Site, thin bands of head deposits and Sleaford sand and gravel are present directly over the bedrock, as detailed in **Section 21.2** of **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]**. There are large areas of the Site where superficial deposits are absent, according to the

mapping within **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]**.

11.5.5. The bedrock outcrops in a sequence presenting itself from east (youngest) to west (oldest) and comprises Oxford Clay, Kellaways Formation (clays and mudstones), Cornbrash Formation (limestone), Blisworth Clay (clays and mudstones), Blisworth Limestone, Rutland Formation (mudstone with limestone beds) and the Lincolnshire Limestone Formation.

11.5.6. Through reference to historical British Geological Survey borehole records, depths to groundwater appear to vary across the Site, dependent upon the strata. Groundwater in some cases was recorded at shallow depths (2m to 3m below ground level) within weathered limestones and locally within superficial deposits. Groundwater was generally recorded within limestone units at depths between 12m and 30m below ground level.

11.5.7. The Lincolnshire Limestone and Blisworth Limestone are classed as a principal aquifer, with other limestone units (Kellaways Formation, Cornbrash Formation, Rutland Formation) classed as secondary aquifers. The Oxford Clay and Blisworth Clay are classed as an unproductive strata (layers that are unusable for water supplies or do not provide base flow to surface waters); further detail is provided in **Section 13.3** and **Section 21.4** of **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]**. A localised SPZ 1 (inner zone) is located within the Order Limits, centred to the west of Scopwick, protecting a groundwater abstraction located outside of the Order Limits.

11.5.8. SPZ 1, which is classed as the Inner Protection Zone, is defined by a 50-day travel time from any point below the water table to the source, or a minimum 50m radius from the source, whichever is larger. It is usually located immediately adjacent to the well. The Environment Agency's Approach to Groundwater Protection (2018) **[Ref. 11-24]** sets the tightest controls on human activity in this zone. The zone is used to control a wide range of activities that could pose a significant risk to groundwater. The main purpose of this zone is to reduce the risk of pollution from rapidly degrading chemicals and some pathogens.

11.5.9. An area of groundwater SPZ 3 is located within the Site, within Springwell West, broadly at the south-western most boundary, to the south of Bloxham and to the north west of Blankney. The siting zone for the Grid Connection Corridor is located approximately 500m south of an SPZ 3.

11.5.10. SPZ 3 which is classified as a Source Catchment Protection Zone, also referred to as the Total Catchment, Total Capture Zone or Catchment Protection Zone, is defined as the area needed to support the protected yield from long-term groundwater recharge. In areas where the aquifer is

confined beneath low permeability strata, this source catchment may be located some distance from the actual abstraction. For heavily exploited aquifers (i.e. where groundwater abstraction represents a significant percentage of aquifer recharge), much of the recharge area will be covered by SPZs. Due to the interference between abstraction boreholes and seasonal variations in groundwater flow, it is difficult to define individual Catchment Protection Zones with certainty.

11.5.11. The Site is low lying and crossed by a number of drainage ditches and smaller un-named streams, which generally flow towards the east. These are presented on **Figure 15.1: Watercourse and Water Receptors** in **ES Volume 2, [EN010149/APP/6.2]**. Some of these discharge into lesser watercourses such as Springwell Brook and Scopwick Beck, ultimately discharging into the River Witham (located approximately 1km at its closest point to the east of the Site).

11.5.12. **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]** has only identified the use of pesticides and herbicides through the Site's agricultural history as a potential source of on-site contamination; however, it is considered that if pesticides have been used in line with current best practice and legislation (Pesticides Act 1998 **[Ref. 11-26]**), then there are unlikely to be significant concentrations that would pose a risk to groundwater.

11.5.13. The presence of made ground in some areas of the Site is likely, although this is expected to be limited to minor previously developed areas such as small structures (i.e. wind pumps) and tracks, paths and access roads. There are a number of former stone/gravel pits, as well as ponds that have the potential to be infilled with unknown material, although it is likely that any infill comprised natural and/or inert soil.

11.5.14. Two landfills at Brauncewell and Longwood Quarry have been identified as potential significant off-site point sources of contamination (the former being approximately 8m to the south east of the Order Limits, and the latter approximately 321m to the north west of the Order Limits). These landfills were licensed to accept inert and non-biodegradable waste. The permit for the landfill site at Longwood Quarry has recently been surrendered (effective from 13 April 2023), with documentation provided by the Environment Agency to confirm that:

- actions had been completed to avoid a pollution risk; and
- the site had been returned to a satisfactory state, having regard to the state of the site before the facility was put into operation.

11.5.15. Longwood Quarry landfill has therefore been demonstrated to not present a potential significant off-site source of contamination.

11.5.16. The landfill site at Brauncewell may form an off-site point source of contamination, with its proximity and currently active status meaning that risks may exist for affected zones. There are no proposals to incorporate manned structures or un-manned enclosed structures (where gases could accumulate) within these areas of the Site closest to this landfill site.

11.5.17. The following potentially complete pollutant linkage has been identified in relation to land or groundwater receptors:

- Potential impact to shallow groundwater within SPZ 1 via leaching of contaminated soil through the infiltration of rainwater.

11.5.18. An intrusive investigation was carried out across the Site during April and May 2023. As outlined within and secured by the **oCEMP [EN010149/APP/7.7]**, an interpretive report will be produced prior to construction works commencing and will be issued to Lincolnshire County Council.

Soil and agricultural land

11.5.19. Agricultural land has been classified in line with the Natural England 'Technical Information Note TIN049: Agricultural Land Classification: protecting the best and most versatile land', 2nd edition (2012) **[Ref. 11-18]** and Agricultural Land Classification of England and Wales: revised guidelines and criteria for grading the quality of agricultural land **[Ref. 11-16]**.

11.5.20. The classification is based on the long-term physical limitations of land for agricultural use and factors affecting the grade can include climate and the soil characteristics. The combination of climate and soil factors determines the soil wetness and droughtiness. The current agricultural use, or intensity of use, does not affect the grading.

11.5.21. The system classifies land into five grades, with Grade 3 subdivided into Subgrades 3a and 3b. BMV land is defined as Grades 1, 2 and 3a.

11.5.22. **Table 11.11** provides a summary of the agricultural land classification grades for land within the Order Limits.

Table 11.11 Agricultural land classification results of the Order Limits

Agricultural land classification grade	Area (ha)	Percentage (%)
Grade 1	6.0	0.5
Grade 2	80.1	6.3
Grade 3a	455.1	35.6
Grade 3b	582.6	45.5
Grade 4	4.2	0.3
Unsurveyed land (field verges, internal tracks, etc)	152.0	11.8
Total BMV	541.2	42.3
Total non-BMV	586.8	45.9
Total	**1280.0**	**100.00**

11.5.23. The results of the agricultural land classification survey which show the distribution of grades across the key components of the Order Limits, split by each element of the Proposed Development (excluding the cable routes that will be retained as agricultural land), are presented in **Table 11.12.** The survey results are illustrated in **ES Volume 2, Figure 11.1: Agricultural Land Classification [EN010149/APP/6.2]** and **ES Volume 2, Figure 11.2: Agricultural Land Classification Overlay [EN010149/APP/6.2]** and the full results are reported within **ES Volume 3, Appendix 11.1A: Springwell West Agricultural Land Classification**, **Appendix 11.1B: Springwell East Agricultural Land Classification** and **Appendix 11.1C: Springwell Central Agricultural Land Classification [EN010149/APP/6.3]**.

11.5.24. The results for the key components of the Proposed Development are detailed by grade in hectares and outlined as a percentage of each component. The figures have been rounded to one decimal place for the area and one decimal place for the percentage. Given that the surveys were carried out to inform the design development, the survey results presented in **ES Volume 2, Figure 11.1a-c: Agricultural Land Classification Reports [EN010149/APP/6.2]** included areas that are now located outside of the Order Limits.

Table 11.12 Agricultural Land Classification survey results of the key components of the areas surveyed within the Order Limits

Grade/ subgrade category	Temporary land use										Permenant land use	
	Satellite Collector Compounds		Springwell Substation and Main Collector Compound		BESS		Solar PV development		Green Infrastructure (Field Tb2 and community growing area)		Green Infrastructure	
	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (%)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
Grade 1	-	-	-	-	-	-	-	-	-	-	-	-
Grade 2	-	-	-	-	-	-	14.3	2.4	1.9	3.6	11.8	7.1
Subgrade 3a	1.5	50.0	6.9	44.2	12.6	93.3	196.4	33.2	29.8	57.3	65.3	39.3
Subgrade 3b	1.5	50.0	8.6	55.8	0.9	6.7	376.4	63.7	20.4	39.1	89.1	53.6
Grade 4	-	-	-	-	-	-	4.2	0.7	-	-	-	-
Grade 5	-	-	-	-	-	-	-	-	-	-	-	-
Non-agricultural	-	-	-	-	-	-	-	-	-	-	-	-
Urban	-	-	-	-	-	-	-	-	-	-	-	-
Total BMV	1.5	50.0	6.9	44.2	12.6	93.3	210.7	35.6	31.7	60.9	77.1	46.4
Total non-BMV	1.5	50.0	8.6	55.8	0.9	6.7	380.6	64.4	20.4	39.1	89.1	53.6
Total	3.0		15.5		13.5		591.3		52.1		166.2	

11.5.25. A summary of the agricultural land classification results specifically for the proposed area of Solar PV development are presented in **Table 11.13** In comparison to the area of BMV land within the Order Limits, which equates to approximately 42.3% of the surveyed area (as shown in **Table 11.11**), the area of Solar PV development comprises approximately 35.6% BMV land (as shown in **Table 11.13**), and includes no grade 1 land.

Table 11.13 Agricultural land classification results of the area of Solar PV development

Agricultural land classification grade	Area (ha)	Percentage (%)
Grade 1	0	0
Grade 2	14.3	2.4
Grade 3a	196.4	33.2
Grade 3b	376.4	63.7
Grade 4	4.2	0.7
Total BMV	210.7	35.6
Total non-BMV	380.6	64.4
Total	**591.3**	**100.00**

NB: The percentage column indicates the percentage of agricultural land classification grade within the Solar PV development area, not the percentage of agricultural land classification grade within the Order Limits.

11.5.26. The agricultural land classification of the land within the Order Limits can be considered in terms of the national and local context, the baseline of which is described further below.

11.5.27. Grade 1, grade 2 and grade 3a soil (which are considered to be BMV land) account for 48.0% of the total Order Limits (as shown in **Table 11.12**). Agricultural land across England represents between 69% and 70% of the total land within the country. Natural England's Technical Information Note TIN049 **[Ref. 11-18]** estimates that around 42% of agricultural land within England is of 'Best and Most Versatile' quality (with a roughly even split of 21% as grades 1 and 2 and 21% grade 3a), with the proportion of BMV in Lincolnshire rising to 71.2%, which is significantly above the national average. Therefore, in the context of the county, BMV land is abundant.

11.5.28. Agricultural land quality is referred to in the National Policy Statement for Renewable Energy Infrastructure (EN-3) **[Ref. 11-8]** and it notes that lower quality agricultural land, should be preferred, avoiding BMV land "where possible". The Proposed Development would not be deliverable without the temporary use of some BMV land.

11.5.29. The potential use of BMV land has been a key consideration in the development of the design, as discussed in **ES Volume 1, Chapter 4: Reasonable Alternatives Considered [EN010149/APP/6.1]** and several fields have been removed due to them being classified as high grade BMV agricultural land.

11.5.30. The design development has been guided by the Project Principles, as discussed in **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]** and **Design Approach Document [EN010149/APP/7.3]**. The principles seek to prioritise the use of BMV land for arable production where practicable and keep fields comprising solely of grade 1 and 2 within arable production.

11.5.31. There are several fields within the Order Limits that will be required for the installation of cabling, as outlined in **ES Volume 2, Figure 3.1: Zonal Masterplan [EN010149/APP/6.2]**, which will be retained for agricultural use once the cable route has been installed.

11.5.32. Based on data available in the National Soils Map records **[Ref. 11-22]** and the agricultural land classification survey presented in **ES Volume 3, Appendix 11.1A: Springwell West Agricultural Land Classification**, **Appendix 11.1B: Springwell East Agricultural Land Classification** and **Appendix 11.1C: Springwell Central Agricultural Land Classification [EN010149/APP/6.3]**, soil types differ across Springwell West, Springwell Central and Springwell East due to the variations in the soil depth, stone content and wetness class. A summary of the soil types identified in Springwell West, Springwell Central and Springwell East is detailed below and in **ES Volume 2, Figure 11.3: Soils Association Map [EN010149/APP/6.2]**.

Springwell West

11.5.33. The National Soils Map **[Ref. 11-22]** records the fields in Springwell West as mainly belonging to the Marcham soil association. The fields to the south east corner within Springwell West are mapped as Aswarby association and a small area in the north east of Springwell West is mapped as Elmton 1 association.

11.5.34. Soils within the Marcham soil association are typically well-drained and permeable calcareous fine and coarse loamy soils that are shallow over limestone and readily accept winter rainfall with little surface run-off.

11.5.35. Soils in the Aswarby soil association are calcareous, well drained, occasionally waterlogged soils which comprise Jurassic limestone and clay. Soils within the Elmton 1 soil association are calcareous fine loamy soils over limestone. Within Springwell West, Elmton 1 soils occur in the three most northern fields.

11.5.36. The agricultural land classification survey found two main soil types present within Springwell West:

- Freely draining calcareous shallow sandy soils over shattered limestone; and
- Moderately to imperfectly draining calcareous clayey soils.

Springwell Central

11.5.37. The National Soils Map **[Ref. 11-22]** records the fields in Springwell Central as mainly belonging to the Aswarby soil association, with six fields located in the northern end of Springwell Central mapped as Marcham association.

11.5.38. Aswarby soil association soils are calcareous, well drained, occasionally waterlogged soils which are composed of Jurassic limestone and clay.

11.5.39. Marcham soils are typically well-drained and permeable calcareous fine and coarse loamy soils that are shallow over limestone, and readily accept winter rainfall with little surface run-off.

11.5.40. The agricultural land classification survey found five main soil types present within Springwell Central:

- Calcareous loamy soils over hard limestone;
- Calcareous loamy soils over hard shattered limestone;
- Calcareous loamy soils over soft shattered limestone;
- Imperfectly draining calcareous deep clayey soils; and
- Moderately freely draining calcareous loamy soils.

Springwell East

11.5.41. The National Soils Map **[Ref. 11-22]** records land in Springwell East as belonging to the Aswarby, Beccles 1, Curdridge, Elmton 1, Marcham and Isleham 2 soil associations.

11.5.42. Aswarby soil association soils are calcareous, well drained, occasionally waterlogged soils which are composed of Jurassic limestone and clay.

11.5.43. Beccles 1 soils are seasonally waterlogged fine loam over clayey soils. Curdridge soils are coarse loamy soils formed on sandstone that suffer from seasonal waterlogging and groundwater effects.

11.5.44. Elmton 1 soils are calcareous fine loamy soils over limestone. Marcham soils are well-drained and permeable calcareous fine and coarse loamy soils that are shallow over limestone.

11.5.45. Isleham 2 association soils have sandy and peaty topsoil with a pale grey subsoil becoming grey and mottled below.

11.5.46. The agricultural land classification survey found six main soil types present within Springwell East:

- Non-calcareous loamy soils over seasonally waterlogged clay;
- Calcareous heavy soils over shattered limestone;
- Silty clay soil with poorly developed subsoil;
- Freely draining non-calcareous sandy soils;
- Non-calcareous imperfectly draining clay; and
- Moderately freely draining loamy soils.

11.5.47. Soil has a number of functions beyond biomass production, for which the agricultural land classification process is relevant. These other functions can include ecological habitat, soil carbon reserves, soil hydrology as a pathway for water flow, archaeological and cultural interest and as a source of materials **[Ref. 6-18]**. Further detail related to these environmental factors can be found within **ES Volume 1, Chapter 7: Biodiversity, Chapter 8: Climate, Chapter 9: Cultural Heritage and Chapter 15: Water [EN010149/APP/6.1]**.

Future baseline in the absence of the Proposed Development

11.5.48. Within the Order Limits, the land would be expected to continue to be utilised for arable production. The types of crops grown may change over time depending on the landowner/tenant farmers' preference and market trends. Changing climatic conditions resulting from climate change may influence the choice of crops. However, the agricultural land classification grade across the Order Limits is not expected to change.

11.5.49. It is considered that there is unlikely to be any change to the baseline position with respect to the land, groundwater or agricultural land classification.

11.6. Mitigation embedded into the design

11.6.1. This assessment has been based on the principle that measures have been 'embedded' into the design of the Proposed Development to remove potential significant effects as far as practicable, for example by the considered placement of infrastructure. **ES Volume 1**, **Chapter 3: Proposed Development Description [EN010149/APP/6.1]** and **ES Volume 3**, **Appendix 3.1: Project Parameters [EN010149/APP/6.3]** and the Design Commitments which form part of the **Design Approach**

Document [EN010149/APP/7.3] identify measures that have been embedded into the design of the Proposed Development.

11.6.2. The potential use of BMV land has been a key consideration in the development of the design, as discussed in **ES Volume 1, Chapter 4: Reasonable Alternatives Considered [EN010149/APP/6.1]** and several fields have been removed due to them being classified as BMV agricultural land.

11.6.3. In addition, the Applicant sought to work with the landowners to understand relative productivity (including accessibility) of the land to focus on areas of land with poorer yield and to determine if fields that were discounted for development would be suitable would be accessible for continued agricultural use.

11.6.4. The embedded mitigation relevant to this assessment is detailed in **Table 11.14** below.

Table 11.14 Embedded mitigation relevant to land, soil and groundwater

Embedded mitigation measure relevant to land, soil and groundwater	Function	Securing mechanism
Fields comprising solely of Grade 1 or 2 land within the Site will remain available for arable production.	In order to reduce the effects of the Proposed Development on high quality BMV land (grade 1 and grade 2) and to keep this retained for arable production.	**Work Plans [EN010149/APP/2.3]**
The design and layout seeks to minimise disturbance to agricultural land of BMV quality. Where possible, existing access tracks within the Order Limits will be used, and new access tracks will avoid BMV land as far as is practical.	To minimise requirements for use of BMV land for new access tracks, keeping disturbance to a minimum.	
Solar PV mounting structure foundations will be driven or helical piles or concrete footings.	Due to the limited lateral extent of the piles, these are unlikely to significantly impact the underlying groundwater regime in terms of the direction of	**Design Commitments [EN010149/APP/7.4]**

Embedded mitigation measure relevant to land, soil and groundwater	Function	Securing mechanism
	groundwater flow, and therefore would not pose a risk to the groundwater SPZ.	
The foundations for the Solar PV modules will be at a maximum depth of 3m, depending on the ground conditions.	Due to the limited lateral extent of the piles, these are unlikely to significantly impact the underlying groundwater regime in terms of the direction of groundwater flow, and therefore would not pose a risk to the groundwater SPZ.	**Project Parameters** presented in **ES Volume 3, Appendix 3.1 [EN010149/APP/6.3].**
Areas of impermeable surfaces have been assessed in the Flood Risk Assessment (refer to **ES Volume 1, Chapter 15: Water [EN010149/APP/6.1]** and **Flood Risk Assessment [EN010149/APP/7.16]**) and designed to ensure adequate groundwater infiltration is maintained during construction works. The design to ensure adequate infiltration and flood mitigation will be secured by the **Flood Risk Assessment** and supporting **Outline Drainage Strategy [EN010149/APP/7.16]**.	Ensuring adequate groundwater infiltration is maintained during construction works, to minimise the risk of groundwater flooding.	**Outline Drainage Strategy [EN010149/APP/7.16]**
Outline Drainage Strategy	The **Outline Drainage Strategy** (which forms an appendix to the **Flood Risk Assessment [EN010149/APP/7.16]**) will	**Outline Drainage Strategy [EN010149/APP/7.16]**

Embedded mitigation measure relevant to land, soil and groundwater	Function	Securing mechanism
	ensure that the surface water regime during construction will continue to mirror the existing surface water regime and will ensure that there is minimal effect on the existing groundwater conditions.	

11.7. Assessment of likely effects (without additional mitigation)

Construction

Land and groundwater

11.7.1. Construction activities could lead to localised contamination of soil related to potential spills from construction plant through operation or refuelling activities. If contaminated soil associated with past developments is identified, there could be a minor localised source of soil contamination if they are not managed correctly.

11.7.2. Construction activities including piling activities, earthworks, access tracks formation and excavation could lead to minor damage to field drains which may affect the localised drainage of the agricultural land and the groundwater quality of the underlying aquifer and SPZ.

11.7.3. As a result of the construction works, spillages and leaks of fuels, oils and chemicals may lead to effects on groundwater which could result in potential pollution to any underlying aquifers. This may arise from runoff associated with construction activities (e.g. silt run-off during earthworks and accidental spills and leaks from construction plant).

Soil and agricultural land

11.7.4. Construction activities, including trafficking of agricultural land by construction vehicles, formation of construction compounds, installation of the cable route and earthworks may lead to compaction and deterioration of soil and agricultural land during the construction phase.

11.7.5. Access tracks and steep slopes within the Site are likely to be most susceptible to deterioration through erosion.

11.7.6. Some soil types are more susceptible to damage when handled during construction, and due to the use of machinery and vehicular activity, depending upon soil type, climate and wetness class.

Operation (including maintenance)

Land and groundwater

11.7.7. The land contamination assessment presented within **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]** identified potential pathways for contamination. These include leaching of contaminants into the underlying soil and groundwater.

11.7.8. With respect to groundwater, maintenance works (including cleaning of the Solar PV modules and vehicle tracking) could result in spillages and leaks of fuels, oils and chemicals, which could lead to effects on groundwater resulting in potential pollution to any underlying aquifers.

11.7.9. In the instance of a BESS fire there is a potential for chemicals from fire-fighting water to infiltrate the soil or geological units, which could result in potential pollution to the groundwater and any underlying aquifers.

Soil and agricultural land

11.7.10. With respect to soil and agricultural land, there is anticipated to be limited ground disturbance or trafficking over the soil, apart from periodic maintenance requirements, including replacement of damaged parts or cleaning and maintenance of the Solar PV modules, as described in **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]**.

11.7.11. The Proposed Development would lead to temporary impacts to soil and agricultural land for the duration of the operational (including maintenance) phase, in particular the areas in which the BESS, Springwell Substation, Main Collector Compound, Satellite Collector Compounds and operational access tracks would be located.

11.7.12. It is anticipated that the operational (including maintenance) phase of the Proposed Development would lead to a temporary change of land use of 675.4 ha of agricultural land (based on the survey data provided in **Table 11.12**, considering Springwell Substation and Main Collector Compound, BESS, Satellite Collector Compounds, Solar PV development and temporary Green Infrastructure), of which 263.4 ha is classified as BMV land.

11.7.13. It is recognised that this does not account for other existing development and/or approved developments within Lincolnshire that may lead to a

reduction in available BMV land. Cumulative effects on the availability of BMV land in Lincolnshire, considering other existing developments and/or approve developments are detailed in **ES Volume 1, Chapter 16: Cumulative effects [EN010149/APP/6.1]**.

11.7.14. The areas of land underneath the Solar PV modules and within the field margins are expected to be used for ecological mitigation and enhancements, which would include planting and establishment of grassland, which would help to reduce soil degradation and erosion during the operational (including maintenance) phase, which could lead to potential benefits.

Decommissioning

Land and groundwater

11.7.15. Decommissioning activities could lead to minor localised contamination of soil related to potential spills from plant and equipment. They could lead to minor damage to field drains which may affect the localised drainage of the agricultural land and the groundwater quality of the underlying aquifer and SPZ.

11.7.16. With respect to groundwater, decommissioning activities (including earthworks and excavation) could lead to minor damage to field drains, which may affect the localised drainage of the agricultural land and the groundwater quality of the underlying aquifer.

11.7.17. As a result of the decommissioning works, spillages and leaks of fuels, oils and chemicals may lead to effects on groundwater, which could result in potential pollution to any underlying aquifers. This may arise from runoff associated with activities (e.g., silt run-off during earthworks and accidental spills and leaks from machinery).

11.7.18. In the event of fire associated with the BESS, firewater will be generated which could contain compounds that are harmful to the soil, geological units and groundwater. Although the BESS will be one of the elements that is to be decommissioned, there may be a period of the decommissioning phase during which is it still operational, when this issue will remain a potential effect.

Soil and agricultural land

11.7.19. With respect to soil, there is potential for erosion associated with works conducted on steep slopes located within the Order Limits. The number of vehicle movements is anticipated to be less than during the construction phase, limiting the potential for compaction of soil to occur. Decommissioning works are also less likely than construction works to

adversely impact on agricultural field drains as there would be no requirement for piling, so this phase is less likely to result in deterioration of soil quality.

11.7.20. The decommissioning phase would involve the removal of the Solar PV infrastructure, including the Ground Mounted Solar PV generating stations, Collector Compounds, Springwell Substation, BESS and ancillary infrastructure, including any onsite compounds.

11.7.21. All concrete, hardstanding areas, foundations for the infrastructure and any internal tracks would be removed to a depth of up to 1m. It is assumed that all the below ground cables would be left in-situ as these are likely to be located at a depth greater than 1m; therefore, leaving them in the ground would limit the disturbance and impact to the soil quality.

11.7.22. The location of the BESS, Springwell Substation, Main Collector Compound, Satellite Collector Compounds and access tracks will be restored using soil retained onsite, which will be retained in managed bunds; or with new topsoil that would be brought to the Site. The trafficking of soil when conditions are unsuitable (e.g., when soils are wet) could damage soil structure, necessitating remedial activity to restore quality.

11.7.23. Following decommissioning, it is intended that the land would be returned to the landowner(s) for agricultural use. However, for the purposes of this assessment, it has been assumed that Green Infrastructure (excluding Field Tb2 and the community growing area) will be permanent. The permanent land take for Green Infrastructure affects a total area of 166.2ha, of which 77ha are classified as BMV land.

11.7.24. Further detail on the decommissioning phase is detailed in **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]**.

11.8. Additional mitigation

Construction

Land and groundwater

11.8.1. An interpretative report is required relating to site investigation work that has already been completed. As outlined within and secured by the **oCEMP [EN010149/APP/7.7]**, an interpretive report will be produced prior to construction works commencing and will be issued to Lincolnshire County Council. This will provide further information relating to potential pollutant linkages that were identified by **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]**.

11.8.2. An **oCEMP [EN010149/APP/7.7]** is submitted in support of the DCO Application. The **oCEMP [EN010149/APP/7.7]** will be the responsibility of

the Applicant (secured with a DCO requirement), who will engage a principal contractor to implement and manage the construction works. The **oCEMP [EN010149/APP/7.7]** sets out measures to avoid, minimise or mitigate effects on the environment during construction works. This includes procedures to mitigate against erosion, procedures to prevent disturbance of contamination, and emergency procedures to manage accidental spillages and leaks in order to minimise any risk to the soil and groundwater during the construction phase.

11.8.3. A piling risk assessment will be undertaken before the start of construction works and will be secured within the requirements of the **oCEMP [EN010149/APP/7.7]**. This will minimise impacts on groundwater as a result of piling activities.

Soil and agricultural land

11.8.4. The **oSMP [EN010149/APP/7.11]** sets out the measures to manage any potential impacts to the soil and agricultural land during the construction phase, and is secured by a requirement in the **Draft DCO [EN010149/APP/3.1]**. The **oSMP [EN010149/APP/7.11]** identifies those areas within the Site which may be more susceptible to damage, and it advises on when soils are suitable for being handled or trafficked. The **oSMP [EN010149/APP/7.11]** also details measures for soil management and follows the principles of best practice to maintain the physical properties of the soil, with the aim of restoring the land to its pre-construction condition following the temporary construction use and at the end of the lifetime of the Proposed Development.

11.8.5. At the start of the construction phase, the areas of agricultural land required for the temporary Primary and Secondary Construction Compounds and access tracks will be stripped of topsoil, a suitable membrane will be spread and matting will be laid down. The topsoil will be removed and matting laid across the temporary Primary and Secondary Construction Compound locations, onto which stone will be spread. This prevents intermixing of soil with the temporary stone surface.

11.8.6. The topsoil removed during the construction process will be placed temporarily in a low-level bund or bunds on land outside the compound. These bunds are short-term storage areas for the topsoil, which will be used in restoration of these areas once construction is complete. If they will be in place for more than 6 months they will be sown with a low maintenance grass seed mix, in accordance with the measures set out in the **oSMP [EN010149/APP/7.11]**.

11.8.7. Where vehicle movements are required over soils, these will be managed by the **oSMP [EN010149/APP/7.11]** to prevent damage to soil structure. This will control the timing of works (to avoid periods when soil is more

susceptible to damage), and will take into account variables such as soil saturation (with the **oSMP [EN010149/APP/7.11]** defining acceptable saturation levels for trafficking). Although construction of the Proposed Development will not adversely affect soils if the **oSMP [EN010149/APP/7.11]** is followed, it is worth noting that when a reduction in soil quality occurs due to agricultural works being undertaken in non-optimal soil conditions, it is possible to return soils to their former condition after they have dried out, preventing medium or long-term effects.

11.8.8. Access routes for the importation of construction materials, plant and equipment will be determined in advance to avoid inappropriate trafficking of soil and measures contained within the **oCTMP [EN010149/APP/7.8]** will be adhered to, to ensure construction vehicle movements are monitored.

11.8.9. The activities undertaken during the construction phase will be audited against the requirements of the **oSMP [EN010149/APP/7.11]** by the Principal contractor to ensure adherence.

Operation (including maintenance)

Land and groundwater

11.8.10. An **oOEMP [EN010149/APP/7.10]** is submitted in support of the DCO Application. The **oOEMP [EN010149/APP/7.10]** will be the responsibility of the Applicant (secured by a requirement to the **Draft DCO [EN010149/APP/3.1]**), who will engage a Principal contractor to implement and manage the operation (including maintenance) works. The **oOEMP [EN010149/APP/7.10]** will set out measures to avoid, minimise or mitigate effects on the environment during operation (including maintenance). This includes procedures to mitigate against erosion and contaminated land, and emergency procedures to manage accidental spillages and leaks in order to minimise any risk to the soil and groundwater.

11.8.11. To manage the potential impact of firewater associated with the operational BESS, a tanker will be required to remove firewater, which will prevent release to the surrounding environment. The procedures for managing the firewater and mitigating any impact to the environment are documented within and secured by the **oOEMP [EN010149/APP/7.10]** and requirements for the control and safety of the BESS are documented and secured within the **Outline Battery Safety Management Plan [EN010149/APP/7.14]**.

Soil and agricultural land

11.8.12. The **oSMP [EN010149/APP/7.11]** sets out the measures to manage any potential impacts to the soil and agricultural land during the operational (including maintenance) phase, and is secured by a requirement to the DCO. As detailed above for the construction phase, the **oSMP [EN010149/APP/7.11]** identifies areas that may be more susceptible to damage, and advises on when soils are suitable for being handled or trafficked. The **oSMP [EN010149/APP/7.11]** also provides details for managing soil and maintaining the physical properties of the soil.

11.8.13. There will be limited ground disturbance or trafficking over the soil during the operational (including maintenance) phase in comparison to the construction phase. Maintenance will be subject to periodic visits, including replacement of damaged parts or cleaning and maintenance of the Solar PV modules. Established tracks will be used during these activities and therefore any impacts will be minimised.

11.8.14. If appropriate, the timing of works will be managed carefully to consider weather conditions, particularly heavy and persistent rain to minimise vehicles travelling across the Site when soil conditions are wet. Movement of maintenance vehicles during the operation (including maintenance) phase will be limited and will follow access tracks that have been established during the construction phase.

11.8.15. The operation (including maintenance) phase of works will be audited against the requirements of the **oSMP [EN010149/APP/7.11]** by the Principal contractor to ensure adherence.

11.8.16. There is the potential to use the open spaces between the infrastructure and the land beneath the Solar PV modules for pastoral farming (sheep grazing) during the operation (including maintenance) phase, and therefore some agricultural use of the Site can occur during the lifespan of the Proposed Development. It should be noted that although conditions suitable for grazing can be maintained, the Applicant will not be responsible for making arrangements for grazing. The land put forward for this Proposed Development has been agreed with the landowners, and the design and layout of the Proposed Development has evolved to allow continued agricultural use around the Proposed Development, where possible. Further detail on the design evolution and reasonable alternatives considered is provided in **ES Volume 1, Chapter 4: Reasonable Alternatives Considered [EN010149/APP/6.1]**.

11.8.17. As noted for the construction phase, there will continue to be storage of soil in managed, segregated stockpiles. The stockpiles will continue to be managed in accordance with the **oSMP [EN010149/APP/7.11]** during the operation (including maintenance) phase.

Decommissioning

Land and groundwater

11.8.18. An **oDEMP [EN010149/APP/7.13]** is submitted in support of the DCO Application. The **oDEMP [EN010149/APP/7.13]** will be the responsibility of the Applicant (secured by a requirement to the DCO), who will engage a principal contractor to implement and manage the decommissioning works. The **oDEMP [EN010149/APP/7.13]** will set out measures to avoid, minimise or mitigate effects on the environment during decommissioning works. This includes procedures to mitigate against erosion and contaminated land, and emergency procedures to manage accidental spillages and leaks in order to minimise any risk to the soil and groundwater during the decommissioning phase.

11.8.19. Requirements to manage the potential impact of firewater associated with the BESS will remain in place during the decommissioning phase, until no longer necessary, including the requirement for a tanker to remove firewater. The procedures for managing the firewater and mitigating any impact to the environment will be documented within and secured by the **oDEMP [EN010149/APP/7.13]** and requirements for the control and safety of the BESS are documented and secured within the **Outline Battery Safety Management Plan [EN010149/APP/7.14]**.

Soil and agricultural land

11.8.20. The **oSMP [EN010149/APP/7.11]** sets out the measures to manage any potential impacts to the soil and agricultural land during the decommissioning phase, and is secured by a requirement to the DCO. The **oSMP [EN010149/APP/7.11]** identifies those areas within the Site which may be more susceptible to damage, and it advises on when soils are suitable for being handled or trafficked. The **oSMP [EN010149/APP/7.11]** also details measures for soil management and follows the principles of best practice to maintain the physical properties of the soil, with the aim of restoring the land to its pre-construction condition at the end of the lifetime of the Proposed Development. Established tracks will be used during the decommissioning phase and therefore impacts on soil due to vehicle movements will be limited.

11.8.21. As for the construction and operation (including maintenance) phases, the timing of works will be managed carefully to consider weather conditions, particularly heavy and persistent rain to minimise vehicles travelling across the Site when soil conditions are wet. Movement of vehicles will follow access tracks that have established and utilised in the construction and operational (including maintenance) phase.

11.8.22. The decommissioning phase of works will be audited against the requirements of the **oSMP [EN010149/APP/7.11]** by the Principal contractor to ensure adherence.

11.8.23. During the decommissioning phase, all concrete, hardstanding areas, foundations for the infrastructure and any internal tracks will be removed to a depth of up to 1m (as indicated in **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]**). It is assumed that all the below ground cables will be left in situ as these are likely to be located at a depth greater than 1m. This will limit the disturbance and impact to soil quality.

11.8.24. The location of the BESS, Springwell Substation, Main Collector Compound, Balance of Solar System (BoSS), Satellite Collector Compounds, and access tracks will be restored using soil retained onsite, which will be retained onsite in managed bunds; or with new topsoil that will be brought to the Site. Following decommissioning, the land will be reinstated and returned to the condition it was prior to the installation of the Proposed Development.

11.9. Assessment of residual effects (with additional mitigation)

Construction

Land and groundwater

11.9.1. Contamination of land could occur as a result of construction activities (including spills or refuelling activities). There is also the potential for contaminated material to be encountered that is associated with past developments. The sensitivity of the receptor (in terms of risks from contamination) is categorised as low. With the implementation of additional mitigation measures contained within the **oCEMP [EN010149/APP/7.7]**, the magnitude of impact would be considered to be negligible. The significance of effect would be **neutral or slight adverse**. Therefore, the residual effect on land during construction is considered to be **not significant** with respect to potential contamination issues.

11.9.2. In areas of the Site where the groundwater sensitivity is medium or low , the magnitude of impact from leaks and spills of fuel or chemicals during construction works would be considered to be low with the implementation of additional mitigation measures. The **oCEMP [EN010149/APP/7.7]** includes methods for ensuring the safe storage and use of fuels or chemicals, which could be damaging to the groundwater environment if released, and details response plans for addressing leaks and spills to localise any impacts and limit their duration. This would result in the significance of effect being **low adverse** (for medium sensitivity groundwater) or **very low adverse** (for low sensitivity groundwater).

Therefore, the residual effect on groundwater during construction is considered to be **not significant** with respect to medium or low sensitivity water resources.

11.9.3. In areas of the Site where there is a principal aquifer in conjunction with a groundwater SPZ (zone 1, 2 or 3), the receptor sensitivity is high. With the implementation of additional mitigation measures, the potential for leaks and spills will be minimised, and in the event of spillage events, the impacts would be localised and limited in duration. This results in the magnitude of impact being categorised as low. The significance of effect would therefore be **moderate/low adverse**. As this is a split significance range, professional judgement has been applied. Given that potential future leaks and spills caused by construction activities will be minimised or avoided entirely by the additional mitigation (the **oCEMP [EN010149/APP/7.7]**), the significance of effect has been adjusted to **low adverse**. Therefore, the residual effect on high sensitivity groundwater during construction is considered to be **not significant**.

11.9.4. In relation to the impact on groundwater from piling activities and earthworks, the groundwater is deemed to have a high sensitivity in relation to the area of SPZ 1, to the west of Scopwick. After consideration of the additional mitigation (including the piling risk assessment, which will form part of the **oCEMP [EN010149/APP/7.7]**) the magnitude of any impact from piling or earthworks during construction would be low, and therefore the significance of effect is **moderate/low adverse**. As this is a split significance range, professional judgement has been applied. Given that release or transportation of contamination due to piling works or earthworks will be controlled and minimised by the **oCEMP [EN010149/APP/7.7]**, the significance of effect has been adjusted to **low adverse**. Therefore, the residual effect on high sensitivity groundwater from piling is considered to be **not significant**. Where groundwater receptors are of medium or low sensitivity, the magnitude of impact from piling or earthworks is assessed as being low. This results in a significance of effect of **low adverse** (for medium sensitivity groundwater) or **very low adverse** (for low sensitivity groundwater). Therefore, the residual effect on medium to low sensitivity groundwater is considered to be **not significant**.

Soil and agricultural land

11.9.5. With respect to soil and agricultural land, adverse effects could potentially occur during construction, as a result of activities such as topsoil stripping, earthworks, piling, stockpiling of material and larger vehicle movements occurring during this phase.

11.9.6. In terms of adverse impacts to the agricultural land classification grade of the soil, it should be noted that construction works would not have

sufficiently great impacts on the soil resource to result in a downgrade to the agricultural land classification. Correct soil management techniques will ensure that soil compaction is minimised, and any impacts could be reversed by techniques that are common in normal agricultural land management. Given that the additional mitigation for the Proposed Development includes an **oCEMP [EN010149/APP/7.12]** and **oSMP [EN010149/APP/7.11]**, which will protect soil resources in terms of physical and chemical characteristics, it is considered that a change to existing agricultural land classification grades as a result of this Proposed Development is highly unlikely to occur.

11.9.7. Machinery that is used in the construction process will be of similar size, or smaller/lighter, than plant used in standard agricultural processes. Therefore, the construction works will not result in additional loads on the soil compared to the current agricultural use.

11.9.8. Given the information detailed in this section and **Section 11.8**, damage to soils during construction will be limited, and there is the potential to restore soils if accidental damage did occur.

11.9.9. The approach outlined for the construction works for the Proposed Development has been approved in principle for other recent large solar developments, including Little Crow Solar Development [EN010101], for which the following comments were provided by the Secretary of State:

The effect on soils would be:

short term, reversible, local in extent and of negligible significance during the construction and decommissioning phases; and

medium term, reversible, local in extent and of negligible significance during the operational (including maintenance) phase, with a moderate beneficial effect for the quality of soils within the Order Limits, because intensive cropping would be replaced by the growing of grass.

11.9.10. It has therefore been assessed that changes to the land used for the Solar PV modules and other temporary facilities will be reversible, and the soil will be managed and reinstated to retain the soil quality and existing agricultural land classification grade.

11.9.11. Soil and agricultural land on the Site are classified as very high (grade 1 and 2 land), high sensitivity (grade 3a) and medium sensitivity (grade 3b land). It is considered that any impact as a consequence of construction activities will at worst lead to a temporary reduction in availability of agricultural land, with no discernible change in soil quality or agricultural land classification grade. The potential for damage to field drains (with possible subsequent effects on drainage of agricultural land) will be

managed by the **oCTMP [EN010149/APP/7.8]**. The area within the Order Limits that is classified as BMV land is 541.2 ha (42.3%). Therefore, given a temporary and reversible reduction in availability of agricultural land and the additional mitigation proposed, the magnitude of impact is minor. The significance of effect is therefore determined to be **moderate or large adverse** for very high sensitivity soils, **slight or moderate adverse** for high sensitivity soils and **slight adverse** for medium sensitivity soils. As the higher of these effects has a split significance range, professional judgement has been applied, based on the information provided in the preceding sections. Given that the quality of the soil, and the agricultural land classification grade, will not be changed by the Proposed Development (with works all being completed in accordance with the **oSMP [EN010149/APP/7.11]** and **oCEMP [EN010149/APP/7.10]**), it is considered appropriate to adjust the significance of effect to **moderate adverse** for very high sensitivity soil. For high sensitivity soil, the significance of effect is adjusted to **slight adverse**. The residual effect on very high sensitivity soil and agricultural land from the works associated with the construction of the Proposed Development is therefore assessed as being **significant**. The residual effect on **high** and **medium** sensitivity soil is assessed as being **not significant**.

Operation (including maintenance)

Land and groundwater

11.9.12. Contamination of land could occur as a result of activities undertaken during operation (including spills or refuelling activities). The sensitivity of the receptor (in terms of risks from contamination) is categorised as low. With the implementation of additional measures contained within the **oOEMP [EN010149/APP/7.10]**, the magnitude of impact would be considered to be negligible. The significance of effect would be **neutral or slight adverse**. Therefore, the residual effect on land during operation is considered to be **not significant** with respect to potential contamination issues.

11.9.13. Contamination of land could also occur as a result of release of firewater from the BESS compound. The sensitivity of the receptor (in terms of risks from contamination) is categorised as low. With the implementation of additional measures contained within the **oOEMP [EN010149/APP/7.10]** and **Outline Battery Safety Management Plan [EN010149/APP/7.14]**, the magnitude of impact would be considered to be negligible. The significance of effect would be **neutral or slight adverse**. Therefore, the residual effect on land during construction is considered to be **not significant** with respect to potential contamination issues.

11.9.14. In areas of the Site where the groundwater sensitivity is of medium or low sensitivity, any magnitude of impact from leaks and spills of fuel or

chemicals during operation (including maintenance) would be considered to be low, with the implementation of additional mitigation measures. This is because the **oOEMP [EN010149/APP/7.10]** includes methods for ensuring the safe storage and use of fuels or chemicals, which could be damaging to the groundwater environment if released; and details response plans for addressing leaks and spills to localise any impacts and limit their duration. This would result in the significance of effect being **low adverse** (for medium sensitivity groundwater) or **very low adverse** (for low sensitivity groundwater). Therefore, the residual effect on **medium** to **low** sensitivity groundwater is considered to be **not significant**.

11.9.15. In areas of the Site where there is a principal aquifer in conjunction with a groundwater SPZ (zone 1, 2 or 3), the receptor sensitivity is high. With the implementation of additional mitigation measures, the potential for leaks and spills will be minimised during operation (including maintenance), and in the event of spillage events, the impacts would be localised and limited in duration. This results in the magnitude of impact being categorised as **low**. The significance of effect would be **moderate/low adverse**. As this is a split significance range, professional judgement has been applied. Given that potential future leaks and spills caused by activities will be minimised or avoided entirely by the additional mitigation (the **oOEMP [EN010149/APP/7.10]**), the significance of effect has been adjusted to **low adverse**. Therefore, the residual effect on **high** sensitivity groundwater is considered to be **not significant**.

Soil and agricultural land

11.9.16. Based on **ES Volume 2, Figure 3.1: Zonal Masterplan [EN010149/APP/6.2]**, it is anticipated that the operational (including maintenance) phase of the Proposed Development would lead to a temporary change of land use of approximately 675.4 hectares (including Springwell Substation and Main Collector Compound, BESS, Satellite Collector Compounds, Solar PV development and temporary Green Infrastructure). The potential for impacts to soil is lower during the operational (including maintenance) phase than for construction or decommissioning due to the nature of activities that will be undertaken. However, the **oOEMP [EN010149/APP/7.10]** requires adherence to good practice to prevent damage to soil resources.

11.9.17. Soil and agricultural land on the Site are classified as very high, high or medium sensitivity depending on the agricultural land classification grade. However, it is considered that the only impact as a consequence of operational (including maintenance) activities is likely to be the temporary reduction in availability of agricultural land, with no discernible change in soil quality or agricultural land classification grade. It is anticipated that the operational (including maintenance) phase of the Proposed Development would lead to a temporary change of land use of 675.4 ha of agricultural

land, of which 263.4 ha is classified as BMV land. The duration of the operational phase of each phase of the Proposed Development is 40 years. Therefore, given a temporary and reversible reduction in availability of agricultural land for the Springwell Substation and Main Collector Compound, Satelliete Collector Compounds, BESS, Solar PV development and Green Infrastructure (Field Tb2 and community growing area), the magnitude of impact is minor. The significance of effect is therefore determined to be **moderate or large adverse** for very high sensitivity soil, **slight or moderate adverse** for high sensitivity soil and **slight adverse** for medium sensitivity soil. As the higher of these rankings is a split significance range, with the same justification as provided in **paragraph 11.9.11**, it is considered appropriate to adjust the significance of effect to **moderate adverse**. The significance of effect for high sensitivity soil is adjusted to **slight adverse**. The residual effect on **very high** sensitivity soil and agricultural land during operation (including maintenance) of the Proposed Development is therefore assessed as being **significant**. The residual effect on **high** and **medium** sensitivity soil is assessed as being **not significant**.

Decommissioning

Land and groundwater

11.9.1. Contamination of land could occur as a result of decommissioning activities (including spills or refuelling activities). The sensitivity of the receptor (in terms of risks from contamination) is categorised as low. With the implementation of additional measures contained within the **oDEMP [EN010149/APP/7.13]**, the magnitude of impact would be considered to be negligible. The significance of effect would be **neutral or slight adverse**. Therefore, the residual effect on land during decommissioning is considered to be **not significant** with respect to potential contamination issues.

11.9.18. In areas of the Site where the groundwater sensitivity is of medium or low sensitivity, the magnitude of impact from leaks and spills of fuel or chemicals, or from changes to the groundwater regime as a result of damage to field drains during decommissioning works, would be considered to be **low**, with the implementation of additional mitigation measures. This is because the **oDEMP [EN010149/APP/7.13]** includes methods for ensuring the safe storage and use of fuels or chemicals, which could be damaging to the groundwater environment if released, and details response plans for addressing leaks and spills to localise any impacts and limit their duration. This would result in the significance of effect being **low adverse** (for medium sensitivity groundwater) or **very low adverse** (for low sensitivity groundwater). Therefore, the residual effect on medium or low sensitivity groundwater is considered to be **not significant**.

11.9.19. In areas of the Site where there is a principal aquifer in conjunction with a groundwater SPZ (zone 1, 2 or 3), the receptor sensitivity is **high**. With the implementation of additional mitigation measures, the potential for leaks and spills during decommissioning works will be minimised, and in the event of spillage events, the impacts would be localised and limited in duration. This results in the magnitude of impact being categorised as **low** and the . significance of effect would be **moderate/low adverse**. As this is a split significance range, professional judgement has been applied. Given that potential future leaks and spills caused by decommissioning activities will be minimised or avoided entirely by the additional mitigation (the **oDEMP [EN010149/APP/7.11]**), the significance of effect has been adjusted to **low adverse**. Therefore, the residual effect on **high** sensitivity groundwater is considered to be **not significant**.

Soil and agricultural land

11.9.20. As in the earlier phases, where vehicle movements are required over soils for decommissioning activities, these will be managed by the **oSMP [EN010149/APP/7.11]** to prevent damage to soil structure, as well as potential damage to field drains (and subsequent effects on drainage of agricultural land). This will control the timing of work and take into account soil saturation. Although the decommissioning phase will not adversely affect soils if the **oSMP [EN010149/APP/7.11]** is followed, as above, it is worth noting that a reduction in soil quality can be reversed, preventing medium or long-term effects.

11.9.21. As for the construction phase, machinery that is used in the decommissioning phase will be of similar size, or smaller/lighter, than plant used in standard agricultural processes, so the works will not result in additional loads on the soil compared to the prior agricultural use. Damage to soils during decommissioning will be limited, and there is the potential to restore soils if accidental damage did occur.

11.9.22. Changes to the land used for the Solar PV modules and other temporary facilities will be reversible, and the soil will be managed and reinstated to retain the soil quality and existing agricultural land classification grade. Restoration works will ensure that the areas are returned to the agricultural land classification grade that was recorded prior to construction.

11.9.23. Soil and agricultural land on the Site are classified as very high, high or medium sensitivity. However, it is considered that any impact as a consequence of decommissioning activities would be localised and unlikely to lead to an irreversible loss of BMV; therefore, the magnitude of impact is considered to be negligible. The significance of the residual effect would therefore be **slight adverse or neutral** and **not significant**.

Operation (including maintenance) and decommissioning

Soil and agricultural land in areas of green infrastructure

11.9.24. With respect to areas of the Site that are to undergo permanent change in land use, this only applies to areas of permanent green infrastructure, listed as *'green infrastructure (permanent land use)'* in **Table 11.12**. It should be noted that some areas of green infrastructure will not be permanent (as detailed in the columns *'green infrastructure (temporary land take)'* in **Table 11.12**), and will be returned to agricultural use on decommissioning. In Field Tb2, green infrastructure will be removed as part of decommissioning works (which will include re-levelling and removal of the earth bund), in order to return this field to agricultural use. Field Tb2 partly comprises ALC grade 3a (BMV) land, and partly ALC grade 3b (non-BMV) land. The restoration of this field after decommissioning will therefore return this area of BMV land to agricultural use. Where the green infrastructure is permanent, this will incorporate landscape structural planting, including tree planting, hedgerows and scrub, which will be created to deliver biodiversity mitigation and enhancement associated with the Proposed Development.

11.9.25. The permanent land take for landscape structural planting affects a total area of 166.2ha, of which 77ha are classified as BMV land. This land would not be occupied by permanent hardstanding, buildings or other infrastructure associated with the Proposed Development, but would comprise landscaped areas that are to be incorporated into the Proposed Development in order to provide beneficial attributes in terms of biodiversity mitigation and enhancement. Therefore, although this area of permanent landscaping does result in the lack of availability of a small proportion of agricultural land (and a smaller area of BMV land), this is considered to be offset by the positive impacts associated with the provision of biodiversity mitigation and enhancement areas.

11.9.26. For the purposes of this assessment, this land is assumed to be permanently turned over to landscaping and the change in land use is assumed to be irreversible.

11.9.27. The sensitivity of the receptor is very high (grade 1 and 2), high (grade 3a) or medium (grade 3b). The magnitude of impact is **major**, as greater than 20 ha of land will be permanently affected. The impact is considered to be **beneficial** with respect to soil quality, but is considered to be **adverse** in terms of availability of agricultural land. The significance of effect is determined to be **very large** for very high sensitivity soil, **large or very large** for high sensitivity soil and **moderate or large** for medium sensitivity soil. The residual effect from the works associated with the operation (including maintenance) of the Proposed Development is therefore assessed as being **significant** (**adverse)** for agricultural land use and

significant (beneficial) for soil quality. However, as noted above, the significance of the adverse effect on availability of agricultural land should be considered alongside the clear beneficial effects of this land being an area of biodiversity mitigation and enhancement and providing visual mitigation, plus the beneficial effects to soil quality.

11.10. Opportunities for enhancement

11.10.1. A reinstatement and habitat creation programme would commence following the construction phase, which will enhance soil quality. This would include landscaping, habitat management and biodiversity enhancement. Areas under the Solar PV modules and the landscape buffers would be planted with tussocky grassland, flower-rich natural grassland, legume-rich modified grassland, trees and hedgerows.

11.10.2. Tree belts would be planted strategically to provide visual screening and ecological habitats to achieve a biodiversity net gain. The reinstatement and creation of the landscape and habitat will be undertaken in accordance with the **Outline Landscape and Ecology Management Plan [EN010149/APP/7.9]**.

11.10.3. The cessation of agricultural activity on some parts of the Site during construction and operation could lead to the stabilisation of soil and may reduce soil-laden runoff into non-designated watercourses on Site. A reduction in the application of herbicides, pesticides or fertilizers as a result of changes in land management from agricultural producer to solar farm will result in a reduction of surface water runoff from the Site polluted with herbicides, pesticides or fertilizers.

11.10.4. Furthermore there is potential that soil health could be enhanced over the assumed 40 year period of operation of the Proposed Development due to the implementation of the **oSMP [EN010149/APP/7.11]** and due to the cover of grassland at field margins and underneath the Solar PV modules which would reduce the impact of soil erosion.

11.11. Monitoring requirements

11.11.1. To ensure that the impact on agricultural land is minimised during construction and decommissioning, activities will be audited by the principal contractor against the requirements of the **oCEMP [EN010149/APP/7.7]**, **oSMP [EN010149/APP/7.11]** and **oDEMP [EN010149/APP/7.13]** to ensure adherence.

11.12. Difficulties and uncertainties

11.12.1. Data gaps and uncertainties identified by **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]** include:

- Gaps in available historical OS maps 1889 to 1904, 1907 to 1946, 1952 to 1955, 1957 to 1977, 1981 to 1984, 1986 to 1993, 1996 to 1999 and 2001 to 2021. It should be noted that this is not expected to cause difficulties, as there are unlikely to have been changes across the Site that occurred between map editions that would affect land, soil or groundwater factors. However, it is considered necessary to point out that this dataset is not continuous;
- Access was not available to some areas within the Order Limits (Field references B5, B6, B9, B10, B11, D14, D15, D16,G3 and G4) at the time the site walkover was undertaken to inform **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3].** However, aerial photography has been reviewed for these locations, and all datasets do cover the full Order Limits. The lack of a physical walkover within these fields is not considered to be detrimental to the datasets relating to land, soil and groundwater issues;
- No information on actual concentrations of contaminants in soil and groundwater were available for **ES Volume 3, Appendix 11.2: Preliminary Risk Assessment [EN010149/APP/6.3]; and**
- There is no definitive method of calculating droughtiness in soil containing shattered limestone, and therefore this has been carried out using professional judgement.

11.13. Summary

11.13.1. A summary of this assessment is presented in **Table 11.15.** The sensitivity of each receptor is identified alongside any relevant embedded mitigation and the potential effects that could arise on those receptors. Any proposed additional mitigation measures are stated, and the magnitude of impact and residual effects then assessed. Finally, any monitoring requirements are stated where applicable.

Table 11.15 Assessment summary

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
Construction phase							
Land	Low	None	Contamination from construction activities, or encountering existing contamination	**oCEMP [EN010149/APP/7.7]**	Negligible	**Neutral or slight adverse (-) (D) (ST) or (MT) (T) Not significant**	N/A
Groundwater	Medium or low	None	Damage to groundwater quality due to leaks or spills of fuel or chemicals	**oCEMP [EN010149/APP/7.7]**	Low	**Very low adverse** (for low sensitivity) **or low adverse** (for	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
			during construction.			medium sensitivity) **(-) (D) (ST) or (MT) (T)** **Not significant**	
Groundwater	High	None	Damage to groundwater quality due to leaks or spills of fuel or chemicals during construction.	**oCEMP [EN010149/APP/7.7]**, specifically including the piling risk assessment.	Low	**Low adverse** **(-) (D) (ST) or (MT), (T)** **Not significant**	N/A
Groundwater	Medium or low	None	Damage due to piling or	**oCEMP [EN010149/APP/7.7]**, specifically including	Low	**Low adverse** (for medium	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
			earthworks activities	the piling risk assessment.		sensitivity) **or very low adverse** (for low sensitivity) **(-) (D) (ST) or (MT), (T)** **Not significant**	
Groundwater	High	None	Damage due to piling or earthworks activities	**oCEMP [EN010149/APP/7.7]**, specifically including the piling risk assessment.	Low	**Low adverse** **(-) (D) (ST) or (MT), (T)** **Not significant**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
Soil and agricultural land	Very high	Use of grade 1 and 2 land (BMV) minimised by design, use of existing tracks where possible, minimising effect on surface water and groundwater regime, and foundation design	Temporary reduction in availability of agricultural land	**oSMP [EN010149/APP/7.11]**	Minor	**Moderate adverse** **(-) (D) or (I), (ST) or (MT), (T)** **Significant**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
Soil and agricultural land	High	Impact on grade 3a land (BMV) minimised by use of existing tracks where possible, minimising effect on surface water and groundwater regime, and foundation design	Temporary reduction in availability of agricultural land	**oSMP [EN010149/APP/7.11]**	Minor	**Slight adverse** **(-) (D) or I, (ST) or (MT), (T)** **Not significant**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
Soil and agricultural land	Medium	Impact on grade 3b land (non-BMV) minimised by use of existing tracks where possible, minimising effect on surface water and groundwater regime, and foundation design	Temporary reduction in availability of agricultural land	**oSMP [EN010149/APP/7.11]**	Minor	**Slight adverse** **(-) (D) or I, (ST) or (MT), (T)** **Not significant**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
Operational (including maintenance) phase							
Land	Low	None	Contamination from operation (including maintenance) activities	**oOEMP [EN010149/APP/7.10]**	Negligible	**Neutral or slight adverse** **(-) (D) (ST) or (MT) (T)** **Not significant**	N/A
Land	Low	None	Contamination from release of firewater from the BESS compound during operation (including maintenance)	**oOEMP [EN010149/APP/7.10]** and **Outline Battery Safety Management Plan [EN010149/APP/7.14]**	Negligible	**Neutral or slight adverse** **(-) (D) (ST) or (MT) (T)** **Not significant**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
Groundwater	Medium or low	None	Damage to groundwater quality due to leaks or spills of fuel or chemicals during operation (including maintenance)	**oCEMP [EN010149/APP/7.7]**	Low	**Low adverse** (for medium sensitivity) and **very low adverse** (for low sensitivity) **(-) (D) (ST) or (MT) (T)** **Not significant**	N/A
Groundwater	High	None	Damage to groundwater quality due to leaks or spills of	**oCEMP [EN010149/APP/7.7]**	Low	**Low adverse**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
			fuel or chemicals during operation (including maintenance)			**(-) (D) (ST) or (MT), (T)** **Not significant**	
Agricultural land (temporary land use)	Very high	None	Availability during operation (including maintenance)	**oOEMP [EN010149/APP/7.10]** and **oSMP [EN010149/APP/7.11]**	Minor	**Moderate adverse** **(-) (D) or I, (ST) or (MT), (T)** **Significant**	N/A
Agricultural land (temporary land use)	High	None	Availability during operation (including maintenance)	**oOEMP [EN010149/APP/7.10]** and **oSMP [EN010149/APP/7.11]**	Minor	**Slight adverse** **(-) (D) or I, (ST) or (MT), (T)**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
						Not significant	
Agricultural land (temporary land use)	Medium	None	Availability during operation (including maintenance)	**oOEMP [EN010149/APP/7.10]** and **oSMP [EN010149/APP/7.11]**	Minor	**Slight adverse** **(-) (D) or I, (ST) or (MT), (T)** **Not significant**	N/A
Decommissioning phase							
Land	None	Low	Contamination as a result of decommissioning activities	**oDEMP [EN010149/APP/7.13]**	Negligible	**Slight adverse or neutral**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
			(including spills or refuelling activities)			**(-) (D) (ST) or (MT), (T)** **Not significant**	
Groundwater	Medium or low	None	Damage to groundwater quality due to leaks or spills of fuel or chemicals during decommissioning	**oDEMP [EN010149/APP/7.13]**	Low	**Very low adverse or low adverse** **(-) (D) (ST) or (MT), (T)** **Not significant**	N/A
Groundwater	High	None	As above	**oDEMP [EN010149/APP/7.13]**	Low	**Low adverse**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
						(-) (D) (ST) or (MT), (T) **Not significant**	
Soil and agricultural land	Very high	None	Damage during decommissioning	**oSMP [EN010149/APP/7.11]** and **oDEMP [EN010149/APP/7.13]**	Negligible	**Slight adverse** **(-) (D) or I, (ST) or (MT), (T)** **Not significant**	N/A
Soil and agricultural land	High	None	Damage during decommissioning	**oSMP [EN010149/APP/7.11]** and **oDEMP [EN010149/APP/7.13]**	Negligible	**Slight adverse**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
						(-) (D) or I, (ST) or (MT), (T) **Not significant**	
Soil and agricultural land	Medium	None	Damage during decommissioning	**oSMP [EN010149/APP/7.11]** and **oDEMP [EN010149/APP/7.13]**	Negligible	**Neutral** **(-) (D) or I, (ST) or (MT), (T)** **Not significant**	N/A
Operation (including maintenance) and decommissioning							
Soil quality in areas of permanent	Very high	None	Improvements to soil quality		Major	**Very large beneficial**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
green infrastructure						**(+) (D) or (I) (P)** **Significant**	
Soil quality in areas of permanent green infrastructure	High	None	Improvements to soil quality		Major	**Large beneficial or very large beneficial** **(+) (D) or I, (ST) or (MT), (T)** **Significant**	N/A
Soil quality in areas of permanent	Medium	None	Improvements to soil quality		Major	**Moderate beneficial or large beneficial**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
green infrastructure						**(+), (D) or I, (ST) or (MT), (T)** **Significant**	
Availability of agricultural land in areas of permanent green infrastructure	Very high	None	Availability of land during operation (including maintenance) and decommissioning	**oSMP [EN010149/APP/7.11]**	Major	**Very large adverse** **(-) (D) (P)** **Significant**	
Availability of agricultural land in areas of permanent	High	None	Availability of land during operation (including maintenance)	**oSMP [EN010149/APP/7.11]**	Major	**Large adverse or very large adverse** **(-) (D) P**	N/A

Receptor	Sensitivity	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
green infrastructure			and decommissioning			**Significant**	
Availability of agricultural land in areas of permanent green infrastructure	Medium	None	Availability of land during operation (including maintenance) and decommissioning	**oSMP [EN010149/APP/7.11]**	Major	**Moderate adverse or large adverse (-) (D) P Significant**	N/A

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Planning Inspectorate Scheme Ref: EN010149