



The Sizewell C Project

6.10 Volume 9 Rail Chapter 10 Soils and Agriculture

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Plates

None provided.

Appendices

Appendix 10A: Green Rail Route: Agricultural Land Classification

10. Soils and agriculture

10.1 Introduction

10.1.1 This chapter of **Volume 9** of the **Environmental Statement (ES)** presents an assessment of the potential effects on soils and agriculture arising from the construction, operation and removal and reinstatement phases (where applicable) of proposals relating to rail.

10.1.2 The proposals considered in this volume are as follows:

- the part of the green rail route comprising a temporary rail extension of approximately 1.8 kilometres (km) from the existing Saxmundham to Leiston branch line to the proposed B1122 (Abbey Road) level crossing inclusive (the 'proposed rail extension route') as shown on **Figure 2.1** of this volume; and
- Saxmundham to Leiston branch line upgrades (including track replacement and level crossing upgrades) (the 'proposed rail improvement works') as shown on **Figure 2.11** of this volume.

10.1.3 Together the two proposals are defined as the 'proposed development'.

10.1.4 The proposed green rail route in its entirety comprises of a temporary rail extension of approximately 4.5km from the existing Saxmundham to Leiston branch line to a terminal within the main development site. The part of the green rail route between the proposed B1122 (Abbey Road) level crossing and the terminal within the main development site is detailed in **Volume 2, Chapters 1 to 4** of the **ES** and assessed in **Volume 2** of the **ES**.

10.1.5 Once the proposed rail extension route is no longer required for the construction of the Sizewell C Project, it would be removed and the land reinstated. The branch line upgrades would be permanent.

10.1.6 Detailed descriptions of the proposed development sites (referred to throughout this volume as the 'site' as relevant to the location of the works), the proposed development and the different phases of development are provided in **Chapters 1** and **2** of this volume. A glossary of terms and list of abbreviations used in this chapter is provided in **Volume 1, Appendix 1A** of the **ES**.

10.1.7 This assessment has been informed by data from other assessments as follows:

- **Chapter 4** of this volume: Noise and vibration;

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- **Chapter 5** of this volume: Air quality;
- **Chapter 7** of this volume: Terrestrial ecology and ornithology;
- **Chapter 11** of this volume: Geology and land quality; and
- **Chapter 12** of this volume: Groundwater and surface water.

10.1.8 Furthermore, this assessment has been informed by data presented in the following technical appendix:

- **Appendix 10A** of this volume: Green Rail Route: Agricultural Land Classification (ALC).

10.1.9 This assessment relates to the following key factors:

- the soil types and related ALC¹ grades likely to be affected by the proposed development;
- the type of farm enterprises and farming or land management practices present, including any agri-environment schemes²; and
- the possible presence of crop or soil or animal diseases or noxious weeds, and the risk of spreading such disease or weeds.

10.1.10 The objectives of the assessment are to:

- characterise the baseline environmental conditions for soils, land-use and agriculture within the study area;
- identify all soils, land-use and agricultural receptors within and adjacent to the site that may be affected by the construction, operation, and removal and reinstatement phases of the site;

¹ Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil characteristics, relief, climate or a combination of these. Grade 3 land is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grades 1, 2 and 3a are defined as best and most versatile (BMV) land.

² Agri-environment schemes are land management practices which protect and enhance the environment, for example planting field margins with food sources for insects and reduced management of hedgerows to provide more habitat for farmland birds.

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- assess the effects of the proposed development on soil, land-use and agriculture, taking account of temporary and permanent land-use requirements and site reinstatement; and
- specify measures, if appropriate, to mitigate potential significant adverse residual effects on soil, land-use and agriculture; and
- determine the residual effects, remaining after additional mitigation.

10.2 Legislation, policy and guidance

10.2.1 **Volume 1, Appendix 6M** of the **ES** identifies and describes legislation, policy and guidance of relevance to the assessment of the potential agriculture and soil impacts associated with the Sizewell C Project across all **ES** volumes.

10.2.2 This section provides an overview of the specific legislation, policy and guidance of relevance to the assessment of the proposed development.

a) International

10.2.3 There is no international legislation or policies deemed relevant to the assessment of effects on soils and agriculture for this site.

b) National

10.2.4 As stated in **Volume 1, Chapter 3** of the **ES**, the Overarching National Policy Statement (NPS) for Energy (NPS EN-1) (Ref. 10.1) when combined with the NPS for Nuclear Power Generation (NPS EN-6) (Ref. 10.2) provides the primary basis for decisions on applications for nuclear power generation developments. A summary of the relevant NPS EN-1 and EN-6 requirements, together with consideration of how these requirements have been taken into account in soils and agricultural assessment is provided in **Volume 1, Appendix 6M** of the **ES**.

10.2.5 In summary, these policies require the impacts on soils and best and most versatile (BMV) land to be considered in the assessment, including seeking to minimise impacts on BMV land and use areas of poorer quality land in preference.

10.2.6 Other national policies of relevance to the assessment include:

- The National Planning Policy Framework – this requires planning policies and decisions to recognise the economic and other benefits of BMV land, and of trees and woodland (Ref. 10.3);

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- Planning Practice Guidance – this refers to agricultural land and the requirement for consultation with Natural England where there is an impact on BMV land (Ref. 10.4);
- Government’s 25 Year Environment Plan – this includes plans to tackle problems of soil degradation and to enhance our natural capital (which includes soils), with an ambition that by 2030 all of England’s soils should be managed sustainably (Ref. 10.5); and
- Safeguarding Our Soils: A Strategy for England– this sets out the Government’s aim to protect agricultural soils, particularly where BMV land is present (Ref. 10.6).

10.2.7 The requirements of these, as relevant to the soils and agriculture assessment, are set out in **Volume 1, Appendix 6M** of the **ES**.

c) **Regional**

10.2.8 No regional policies are deemed relevant to the assessment of effects on soils and agriculture for this site.

d) **Local**

10.2.9 Local policies of relevance to the soils and agricultural assessment include:

- Suffolk Coastal District Council (SCDC) Local Plan Core Strategy and Development Management Policies, published by East Suffolk Council, (Ref. 10.7) – this makes reference to, where possible, preserving prime agricultural land for food production: and
- SCDC Final Draft Local Plan, published by East Suffolk Council – this highlights the presence of BMV land as a key issue (Ref. 10.8).

10.2.10 The requirements of these, as relevant to the soils and agricultural assessment are described in **Volume 1, Appendix 6M** of the **ES**.

e) **Guidance**

10.2.11 This assessment has been undertaken in accordance with the following guidance documents:

- Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, section 3, part 11, LA109 Geology and Soils (Ref. 10.9);

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- Natural England Technical Information Note 049 (2012) (Ref. 10.10);
- Defra Construction Code of Practice for the sustainable re-use of soils on construction sites (Ref. 10.11);
- Good Practice Guide for Handling Soils (MAFF, 2000) (Ref. 10.12); and
- British Standard Specification for Topsoil and Requirements for Use (BS 3882:2015) (Ref. 10.13).

10.2.12 The requirements of these, as relevant to the soils and agriculture assessment, are set out in **Volume 1, Appendix 6M** of the **ES**.

10.3 Methodology

a) Scope of the assessment

10.3.1 The generic Environmental Impact Assessment (EIA) methodology is detailed in **Volume 1, Chapter 6** of the **ES**.

10.3.2 The full method of assessment for agriculture and soils that has been applied for the Sizewell C Project is included in **Volume 1, Appendix 6M** of the **ES**.

10.3.3 This section provides specific details of the agriculture and soils methodology applied to the assessment of the proposed development. The scope of assessment considers the impacts of the construction, operation and removal and reinstatement, where appropriate, of the proposed development.

10.3.4 A screening exercise, as detailed below, has been undertaken for the upgrades on the level crossings on the Saxmundham to Leiston branch line which has reviewed the works proposed. Where the works are considered to have potential likely significant effects, these have been assessed. The scope of the exercise considers the impacts of the upgrade works and operational use of the branch line.

10.3.5 The scope of this assessment has been established through a formal EIA scoping process undertaken with the Planning Inspectorate. A request for an EIA Scoping Opinion was initially issued to the Planning Inspectorate in 2014, with an updated request issued in 2019 see **Volume 1, Appendix 6A** of the **ES**.

10.3.6 Comments raised in the EIA Scoping Opinion received in 2014 and 2019 have been taken into account in the development of the assessment

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methodology. These are detailed in **Volume 1, Appendices 6A to 6C** of the **ES**.

b) Consultation

10.3.7 The scope of the assessment has been informed by ongoing specific consultation and engagement with statutory consultees throughout the design and assessment process. For the soils and agriculture assessment, this has been undertaken on a project-wide basis and details are included in **Volume 1, Appendix 6M** of the **ES** where it was confirmed the approach would follow the published guidelines. No consultation with statutory consultees in relation to soils and agriculture has been undertaken with specific regards to the site.

c) Environmental Screening

10.3.8 The proposed rail extension route has the potential to result in environmental effects which could be significant and therefore these works have been considered in the environmental assessment.

10.3.9 An environmental screening exercise was undertaken to identify which of proposed rail improvement works may give rise to environmental effects that could potentially be significant. This screening exercise concluded that none of the rail improvement works should be taken forward to the assessment of likely effects on soils and agriculture, as shown in **Table 10.1**.

Table 10.1: Summary of environmental screening exercise.

Proposed rail scheme	Summary of potential effects	Screened in or out of the assessment
Proposed Level Crossing Improvements		
Bratts Black Horse.	The level crossing works would remain within the current Network Rail and highway land. Temporary satellite compounds would be required at four of the crossings, each approximately 0.5ha in size, on adjacent land. Given the short-term and small scale of these compounds it is considered impacts on agricultural land or operations would be negligible.	Screened out.
Knodishall		
West House.		
Snowdens		
Saxmundham Road.		
Buckles Wood.		
Summerhill		
Leiston		

10.3.10 The screening exercise has also considered the potential for the proposed rail improvement works on the Saxmundham to Leiston branch line to result in environmental effects which could be significant. As these works would

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be limited to the renewal of the track using new ballast, flat bottom continuously welded rail and concrete sleepers and would take place within the existing railway corridor, with the exception of the temporary compounds, the works are unlikely to impact on agricultural land or operations. Therefore, the rail improvement works on the Saxmundham to Leiston branch line have been screened out and are not considered further within this assessment.

d) Study area

10.3.11 The study area for the soils and agriculture assessment covers the land required for construction, operation, and removal and reinstatement phases of the proposed development. The location and extent of the site are shown in **Chapter 1** of this volume.

10.3.12 The site comprises approximately 23 hectares (ha) of predominantly agricultural land. Non-agricultural land comprises sections of existing roads (Buckleswood Road and Abbey Lane). The site extends in a north-eastern direction from the existing Saxmundham to Leiston branch line, at a point approximately 1.5km west of Leiston, to the Sizewell C main development site.

10.3.13 In addition, the assessment of impacts on farm viability takes into account the extent of each affected land holding so the impact can be considered in the context of the holding.

e) Assessment scenarios

10.3.14 The assessment of effects on geology and land quality includes the assessment of the construction, operation and, where relevant, the removal and reinstatement phase of the proposed development, rather than specific assessment years.

10.3.15 For the purposes of this assessment, effects on BMV land and land holdings are considered to occur during the construction phase and would last until the completion of the removal and reinstatement phase when the land would be returned to agricultural use.

f) Assessment criteria

10.3.16 As described in **Volume 1, Chapter 6** of the **ES**, the EIA methodology considers whether impacts of the proposed development would have an effect on any resources or receptors. Assessments broadly consider the magnitude of impacts and value or sensitivity of resources and receptors that could be affected in order to classify effects.

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10.3.17 A detailed description of the assessment methodology used to assess the potential effects on soils and agriculture for the proposed development is provided in **Volume 1, Appendix 6M** of the **ES**. A summary of the assessment criteria used in this assessment is presented in the following sub-sections.

g) **Sensitivity**

10.3.18 The approach to assigning levels of sensitivity to receptors is summarised in **Table 10.2**.

Table 10.2: Assessment of the value or sensitivity of receptors for soils and agriculture

Value and/or Sensitivity	Description
High	Grade 1, 2 and 3a land (i.e. Best and Most Versatile land (BMV)); Irrigated agriculture; Stock animals; Higher level agri-environment schemes; Soils with low or no wetness limitation affecting workability (Wetness Class I or II), where drought is not also a limitation; and Soils with a high susceptibility to structural damage and soil erosion throughout the year, including heavily textured, poorly structured soils.
Medium	Grade 3b land; Non irrigated agriculture; Entry level agri-environment schemes; Soils with low wetness limitation affecting workability (Wetness Class II), where drought is not also a limitation; and Soils with some seasonal susceptibility to structural damage and soil erosion.
Low	Grade 4 land; Arable or grassland areas; Soils with moderate wetness limitation affecting workability (Wetness Class III or IV); and Soils with medium to coarse textures and some resistance to structural damage for most of the year.
Very Low.	Grade 5 land; Soils with high wetness limitation affecting workability (Wetness Class V or VI); Soils in which susceptibility to drought is a limitation to crop growth; and Coarse textured and stony soils with little potential for structural damage.

i. **Magnitude**

10.3.19 The magnitude of impact is based on the consequences the proposed development would have upon soils and agricultural receptors. There is no

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published guidance on thresholds for assessing what scale of loss should be regarded as significant, but the presence of BMV land is a key factor in the consideration of the sustainability of development proposals as set out in the National Planning Policy Framework (NPPF) (Ref.10.3). The criteria for the assessment of magnitude are shown in **Table 10.3**.

Table 10.3: Assessment of magnitude of impact on soils and agriculture

Magnitude	Criteria
High	<p>Permanent or long-term loss or degradation of over 50ha of BMV land, or entire regional resource of BMV land (Agricultural Land Classification (ALC) Grades 1, 2, 3a).</p> <p>Loss of >20% of farmed land associated with an agricultural farm holding.</p> <p>Permanent loss of entire area of land under agri-environment or Woodland Grant scheme.</p> <p>No access possible to severed land.</p> <p>Existing land-use across land holding would not be able to continue.</p>
Medium	<p>Permanent or long-term loss or degradation of 20-50ha of BMV land, or large proportion of regional resource of BMV land.</p> <p>Loss of >10- 20% of farmed land associated with an agricultural farm holding.</p> <p>Long-term, reversible, loss of entire area or majority of land under agri-environment or Woodland Grant scheme. Access possible to severed land via the public highway.</p> <p>Existing land-use across land holding would be able to continue but with major changes such as loss of yield, additional land management or increased use of fertilisers and herbicides.</p>
Low	<p>Permanent or long-term loss or degradation of 10-20ha of BMV land, or small proportion of regional resource of BMV land.</p> <p>Loss of >5-10% of farmed land associated with an agricultural farm holding.</p> <p>Short- to medium-term reversible loss, or permanent loss of small areas, of land area under agri-environment or Woodland Grant scheme.</p> <p>Access possible to severed land via private ways.</p> <p>Existing land-use across land holding would be able to continue but with some changes such as loss of yield, additional land management or increased use of fertilisers and herbicides.</p>
Very Low.	<p>Permanent or long-term loss or degradation of <10ha of BMV land.</p> <p>Loss of <5% of farmed land associated with an agricultural farm holding.</p> <p>No severance.</p> <p>Short-term impacts to receptors with no impact on integrity. No material changes to existing land-use.</p>

10.3.20 For the purposes of this assessment long-term is considered to include the timeframe of the construction, operation and removal and reinstatement phases of the proposed development.

ii. Effect definitions

10.3.21 The definitions of effect for agriculture and soils are shown in **Table 10.4**.

Table 10.4: Classification of effects

		Value / Sensitivity of receptor			
		Very Low	Low	Medium	High
Magnitude	Very Low	Negligible	Negligible	Minor	Minor
	Low	Negligible	Minor	Minor	Moderate
	Medium	Minor	Minor	Moderate	Major
	High	Minor	Moderate	Major	Major

10.3.22 Following the classification of an effect as presented in **Table 10.4**, a clear statement is made as to whether the effect is 'significant' or 'not significant'. As a general rule, major and moderate effects are considered to be significant and minor and negligible effects are considered to be not significant. However, professional judgement is also applied where appropriate.

h) Assessment methodology

10.3.23 **Volume 1, Appendix 6M** of the **ES**, sets out the detailed methodology followed. A summary of the assessment criteria used in this assessment is presented in the following sub-sections.

i. Establishing the baseline

10.3.24 The principal agricultural and related resources are characterised by the quality of the agricultural land (i.e. the land grade according to the ALC system) and type of land use (e.g. arable land, presence of livestock etc.) including any diversified activities on farms (e.g. farm shops).

10.3.25 Soil and ALC surveys were undertaken in accordance with published guidelines (Ref. 10.14). A detailed ALC survey was undertaken in August 2016 and April 2019, examining soil properties to a depth of up to 1.2m below ground level at 23 locations, see **Appendix 10A** of this volume.

10.3.26 Soil physical characteristics were recorded so that factors such as soil texture, structure, depth and stoniness could be assessed in terms of any limitation they pose to agricultural productivity. Site characteristics, such as micro-relief (topographical changes over short distances) and flood risk, and climate were also assessed in terms of potential limitations they may pose to agricultural productivity.

ii. Assessment

10.3.27 As set out above, the assessment of effects on soils and agriculture includes the following steps:

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- establishing the baseline environmental conditions for soils, land-use and agriculture within the study area and identifying relevant receptors;
- assessing the likely significant effects of the proposed development on soil, land-use and agriculture, taking account of temporary and permanent land-use requirements and site restoration;
- specifying measures, if appropriate, to mitigate potential significant adverse effects on soil, land-use and agriculture; and
- determining the residual effects remaining after additional mitigation.

iii. Assumptions and limitations

10.3.28 No assumptions or limitations have been identified above and beyond those embedded in the published ALC methodology in relation to agricultural land quality.

10.3.29 Information on land use is based on information publicly available and as provided by the landowner at the time of the survey.

10.4 Baseline environment

10.4.1 This section presents a description of the baseline environment within the site and the surrounding area.

10.4.2 Further detail of the agricultural land quality at the site is presented in **Appendix 10A** of this volume.

a) Current baseline**i. Geology**

10.4.3 The site is underlain by the Crag Group (quaternary shallow-water marine and estuarine sands, gravels, silts and clays), with an overlying drift deposit of superficial diamicton of the Lowestoft Formation (an extensive sheet of poorly-sorted matrix-supported chalky till as well as outwash sands and gravels, silts and clays) (Ref. 10.15).

10.4.4 A full description of the geological characteristics of the site is provided in **Chapter 11** of this volume, geology and land quality assessment.

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ii. Topography and drainage

- 10.4.5 Land within the site lies at approximately 20m AOD. The land slopes gently upwards from north to south before sloping downwards toward the centre of the site before sloping back upward to the most southern point of the site. Gradient and microtopography do not limit ALC grade within the site.
- 10.4.6 No natural watercourses adjoin the site and there is no evidence that flood risk limits ALC grade at any part of the site based on the ALC criteria.
- 10.4.7 Further details are provided in **Chapter 12** of this volume, groundwater and surface water assessment.

iii. Climate

- 10.4.8 The main parameters used in the assessment of an overall climatic limitation are presented in **Appendix 10A** of this volume. They specifically refer to annual average rainfall as a measure of overall wetness, and accumulated temperature over the growing season, as a measure of the warmth in the growing season. The site is considered to have both relatively low rainfall, and a long growing season, and thus climate does not impose an overall limitation on ALC grade at this site.

Climate has an important influence on the interactive limitations of soil wetness and soil droughtiness. The relatively low rainfall, and long growing season will act to decrease the severity of any potential soil wetness limitation (i.e. reducing the potential for waterlogging to occur which may restrict plant rooting and the ability of the land to be managed). However, these attributes increase the severity of any potential soil droughtiness limitation (i.e. reduced availability of water for plant uptake).

iv. Soils types

- 10.4.9 The site comprises different soils in the eastern, central and western parts of the site (**Figure 10.1**).
- 10.4.10 In the eastern part of the site the soils are mapped (Ref. 10.15) as being freely draining slightly acid sandy soils. These belong to the Newport Soil Association³. The main land use on these soils is generally described as being arable crops such as barley, other cereals and sugar beet, with some coniferous woodland and lowland heath habitats. This aligns with the current land use within the site boundary.

³ A Soil Association represents a group of soil types which are typically found occurring together in the landscape.

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- 10.4.11 In the central part of the site the soils are described as being freely draining slightly acid but base-rich soils. These belong to the Melford Soil Association. The main land use on these soils where they occur in Eastern England is described as being arable crops.
- 10.4.12 In the south-western part of the site the soils are described as slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. These belong to the Ragdale Soil Association. The main land use on these soils is generally described as being arable, aligning with the current land use within the site boundary.
- 10.4.13 Field survey work undertaken in August 2016 and April 2019, as provided in **Appendix 10A** of this volume, found soil material that was a mixture of medium to heavy textured (loams to clays) in the more southern section of the site and in the centre and to the north of the site material comprised lighter textured (sandy) material as well as the heavier textured material.
- 10.4.14 There is potential for Made Ground to be present associated with the existing railway line, roads crossing the route or other small-scale structures where present including unmapped farmer's tips. Made Ground will also be present associated with the old sand pits located within the site vicinity

v. [Agricultural land quality and classification](#)

- 10.4.15 Published ALC maps (Ref. 10.16) show the site to comprise predominantly Grade 2 land (**Figure 10.2**). These maps are published at a scale of 1:250 000 and are generally considered to be of value for strategic land use planning purposes and not site-specific assessments, although they do provide a guide as to the likely land grades. It should be noted also that these maps do not distinguish between the Sub-grades 3a and 3b.
- 10.4.16 Since the publication of the Provisional ALC, certain areas of the country have been surveyed in greater detail. However, there are no detailed ALC maps available for this site. As such detailed ALC surveys were undertaken on the agricultural land in August 2016 and April 2019. At the time of the ALC surveys the site was under arable production, comprising potatoes and a cereal crop. The site forms part of a freehold owner-occupied plot.
- 10.4.17 **Figure 10.3** illustrates the distribution of ALC grades across the site, determined by the ALC surveys. The majority of the agricultural land is Grades 3a (8.6ha), 3b (11.7ha) and 4 (1.7ha). The remainder of the sites is classified as non-agricultural (1.0ha).

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10.4.18 ALC grade distribution the corresponding percentages, are shown in the **Table 10.5**. Full details of the ALC survey are presented in **Appendix 10A** of this volume.

Table 10.5: ALC grade distribution

ALC Grade	Area (ha)	Area (%)
1	0	0
2	0	0
3a	8.6	37.39
3b	11.7	50.87
4	1.7	7.39
5	0	0
Non-agricultural	1.0	4.35
Total	23.00	100

10.4.19 Grade 3a land covers an area of 8.6ha (approximately 37.39% of the site). This land contains medium textured clay loam topsoil overlying clayey subsoil. Some of these profiles are also calcareous in the topsoil. In these areas, the land is limited to Grade 3a by droughtiness and/or and wetness. The land is occasionally waterlogged (Wetness Class III).

10.4.20 Grade 3b land covers 11.7ha in total (approximately 50.87% of the site). This land contains either medium to heavy textured clay loams overlaying clayey subsoils which are slowly permeable or lightly textured loamy sands overlaying permeable sands. The land in these areas is limited to Grade 3b by droughtiness and/or wetness in the heavier textured clay areas and droughtiness in the lightly textured sandy areas.

10.4.21 Grade 4 land comprises 1.7ha in total (approximately 7.39% of the site) in one part of the site. Land is not limited by wetness (Wetness Class I); however, due to lightly textured sandy subsoils with high permeability the soils are limited by droughtiness.

vi. [Land use and holding information](#)

10.4.22 The agricultural land within the site (approximately 22ha) falls within four ownerships, all of which were under arable (cereal) production at the time of survey. The fields are relatively large and separated by hedgerows with some standard trees. Details of the land uses present are shown in **Table 10.6**.

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Table 10.6: Details of land holdings within the site

Holding name	Description	Landholding area within the site boundary	Total landholding area (approx.)	Percentage of landholding within the site boundary	Sensitivity to change
Leiston House Farm / Wood Farm.	Arable land (cereal crops). Land accessed from Buckleswood Road. Land not under agri-environment schemes.	10.37ha	121.27ha	8.55%	Low
Land lying to the south of Abbey Lane.	Arable land (cereal crops). Land accessed from Abbey Lane. Land not under agri-environment schemes.	7.20ha	18.21ha	39.57%	Low
Aldhurst Farm Cottages.	Arable land. Land accessed from Abbey Lane. Land not under agri-environment schemes.	3.62ha	4.44ha	81.52%	Low
NNB Generation Company (SZC) Limited	Part of Aldhurst Farm habitat creation area. Managed under the Aldhurst Farm Landscape and Ecology Management Plan (occasional management of scrub across the grassland area). Accessed from Lover's Lane. No areas under agri-environment schemes	0.61ha	38.97ha	1.56%	High (biodiversity/ grazing sensitivity).

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vii. Future baseline

- 10.4.23 It is considered unlikely that the land quality baseline conditions would change. The grade of agricultural land is determined predominantly by the soil's physical characteristics (in particular texture and related structure) which would not change.
- 10.4.24 Whilst climate change predictions indicate increased temperatures which could result in increased drought, the soils which are light textured are already limited by droughtiness. Where the soils are relatively heavy (in terms of texture) they have a good capacity to hold water for crops to access. Overall, in the timeframe of the construction, operation and removal and reinstatement of the proposed rail extension route, it is considered there would be no change in the baseline conditions.
- 10.4.25 There is a committed development in close proximity to the site (DC/16/1961/OUT). This proposed housing development is located immediately to the south of the site, and south of the rail line. It is considered unlikely that this development would materially change the conditions within the site in relation to its agricultural use.

10.5 Environmental design and mitigation

- 10.5.1 As detailed in **Volume 1, Chapter 6** of the **ES**, a number of primary mitigation measures have been identified through the iterative EIA process and have been incorporated into the design and construction planning of the proposed development. Tertiary mitigation measures are legal requirements or are standard practices that will be implemented as part of the proposed development.
- 10.5.2 The assessment of likely significant effects of the proposed development assumes that primary and tertiary mitigation measures are in place. These measures are summarised in this section so that it is clear where and why these measures have been included and the way in which they have contributed to the management and reduction of environmental effects.

a) Primary mitigation

- 10.5.3 Primary mitigation is often referred to as 'embedded mitigation' and includes modifications to the location or design to mitigate impacts, these measures become an inherent part of the proposed development.
- 10.5.4 As part of the design process, the site layout in relation to temporary land requirements has been optimised to reduce the overall land take.
- 10.5.5 A temporary automated level crossing would be constructed where the proposed rail extension route crosses Buckleswood Road, providing safe

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access over the rail extension route for vehicles and non-motorised users. This would reduce potential severance impacts by enabling continued access to land on both sides of the proposed rail extension route.

b) Tertiary mitigation

10.5.6 Tertiary mitigation will be required regardless of any EIA assessment, as it is imposed, for example, as a result of legislative requirements and/or standard sectoral practices. These are relevant to both the construction and reinstatement phases.

10.5.7 The sustainable re-use of the soil resource would be undertaken in line with the Construction Code of Practice for the Sustainable Use of Soil on Construction Sites and the MAFF Good Practice Guide for Handling Soils.

10.5.8 An outline Soil Management Plan (SMP) has been developed, and is provided in **Volume 2, Appendix 17C** of the **ES**. This would include information on handling methods and measures which would be implemented include (but are not limited to):

- development of a Soil Resources Plan by the Contractor, which would include detail on existing soil information, proposed storage locations and management measures;
- ensuring soils are stripped and handled in the driest condition possible;
- ensuring topsoil and subsoil resources are stripped and stockpiled separately;
- protecting stockpiles from erosion through establishment of a grass cover and from tracking over through appropriate signage and/or fencing;
- confining vehicle movements to defined haul routes until all the soil resource has been stripped; and
- ensuring the physical condition of the replaced soil profile to at least 1.2m below ground level following the removal and reinstatement phase is sufficient for the post-construction use.

10.5.9 The requirements of the Outline Soil Management Plan are included within the **Code of Construction Practice (CoCP)** (Doc Ref. 8.11).

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- 10.5.10 All soils would be stored a minimum of 10m away from watercourses (or potential pathways to watercourses) and any potentially contaminated soil would be stored on an impermeable surface and covered to reduce leachate generation and potential migration to surface waters.
- 10.5.11 Industry standard measures would be put in place to control pollution, including from fuel or chemical stores, silt-laden run-off or dust as detailed in the air quality (**Chapter 5**), geology and land quality (**Chapter 11**), and groundwater and surface water (**Chapter 12**) assessments of this volume.
- 10.5.12 Toolbox talks would be used to inform all those working on the site of the requirements for soil handling and minimisation of disturbance to agricultural activities to minimise potential impacts on the remainder of the landholding and on neighbouring landholdings during the construction phase.
- 10.5.13 All fencing around the proposed development would be sufficient to resist damage by livestock from adjacent land and would be regularly checked and maintained in a suitable condition. Any damage to boundary fencing would be repaired immediately.
- 10.5.14 Measures contained in relevant Defra and Environment Agency best practice guidance on the control and removal of invasive weed species (Ref. 10.17) would be implemented where appropriate, such as through the appropriate use of herbicides or removal/burial of plant materials. These are detailed in the **CoCP** (Doc Ref. 8.11).
- 10.5.15 During construction, should animal bones be discovered which may indicate a potential burial site, works would cease, and advice would be sought from the Animal Health Regional Office on how to proceed, relevant to the origin and age of the materials found.
- 10.5.16 All movement of personnel, plant and vehicles between fields would cease in the event of a disease outbreak. Advice and guidance from Defra would be followed to minimise the biosecurity risk associated with the continuation of works.

10.6 Assessment

a) Introduction

- 10.6.1 This section presents the findings of the soils and agriculture assessment for the construction operation and removal and reinstatement of the proposed rail extension route.
- 10.6.2 This section identifies any likely significant effects that are predicted to occur and **section 10.7** of this chapter then highlights any secondary

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mitigation and monitoring measures that are proposed to minimise any adverse significant effects, if required.

b) Construction

i. Agricultural land

10.6.3 The construction of the proposed rail extension route would result in the temporary, long-term loss of approximately 22.0ha of land from primary agricultural productivity. Of this, 8.6ha is considered to be BMV land (Grade 3a).

10.6.4 The Grade 3a land is considered to be a receptor of high value. The magnitude of this impact is assessed as very low. Therefore, this is considered to be a minor adverse effect which would **not significant**.

ii. Land holding

10.6.5 Four land holdings are associated with this site. Whilst land would be required temporarily, this would be for the duration of the construction, operation and removal and reinstatement phases. All land would be returned to agricultural use following reinstatement.

10.6.6 The effects on each holding during the construction phase are summarised in **Table 10.7**. The effects of severance are based on the ease to which land remains accessible with the implementation of the measures outlined previously.

Table 10.7: Summary of effects on holdings during the construction phase

Holding name	Sensitivity to change	Area of holding required	Percentage of holding required during construction	Impact due to severance	Magnitude of impact	Classification of effect during construction
Leiston House Farm / Wood Farm.	Low	10.37ha	8.55%	Potential for small area of land to be severed	Low	Minor adverse (not significant) .
Land lying to the south of Abbey Lane.	Low	7.20ha	39.57%	No severance impacts.	High	Moderate adverse (significant) .
Aldhurst Farm Cottages.	Low	3.62ha	81.52%	No severance impacts.	High	Moderate adverse (significant) .

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Holding name	Sensitivity to change	Area of holding required	Percentage of holding required during construction	Impact due to severance	Magnitude of impact	Classification of effect during construction
NNB Generation Company (SZC) Limited.	High (biodiversity/ grazing sensitivity).	0.61ha	1.56%	No severance impacts.	Very Low.	Minor adverse (not significant) .

10.6.7 Two of the four land holdings affected would experience moderate adverse effects as a result of the land take required, which would be considered **significant**.

10.6.8 The impacts of severance have been limited through the design, including the provision of an automated level crossing where the proposed rail extension route crosses Buckleswood Road. This would ensure no restriction on the use of Buckleswood Road and the access this provides to agricultural land.

10.6.9 The exception is one small area, approximately 1.1ha, of land associated with Leiston House Farm / Wood Farm where access would be restricted by existing boundary features and the proposed rail extension alignment. If access to this land cannot be facilitated through the creation of a new gateway this would increase the proportion of land taken from this land holding to 9.45%. This would not increase the level of magnitude of impact identified above.

iii. **Inter-relationship effects**

10.6.10 There are anticipated to be inter-relationship effects between geology and land quality; landscape; noise; air quality and groundwater and surface water in relation to potential receptors which could be impacted by ground contamination, poor ground conditions resulting from soil handling and noise or dust affecting adjacent land holdings.

10.6.11 There is the potential for effects on agricultural land to increase due to effects arising on land quality as construction activities could result in ground contamination, soil erosion and silt-laden runoff affecting land outside the site boundary or soils required for reinstatement of land required temporarily. The **CoCP** outlines measures which would be used to control runoff, erosion and pollution. The assessment presented in **Chapter 11** of this volume determined that the impact would generally be low or very low and as such it is considered there is limited potential for effects arising from geology and land quality to increase the effects reported on agricultural land. The exception is a risk associated with the potential presence of unexploded ordnance (UXO) associated with the local

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presence of RAF Leiston, identified to potentially affect ground stability. With the primary and tertiary mitigation in place the magnitude of the risk is considered to be medium, which could result in a major adverse effect on BMV land which would be **significant**.

- 10.6.12 In relation to landscape, the ability to create and maintain elements of landscape planting would require soils with appropriate characteristics. The SMP sets out how soils would be stripped, stockpiled and re-used to ensure they are suitable for the required end use. These are established methods, based on published guidance, and as such it is considered there is limited potential for inter-relationship effects with landscape.
- 10.6.13 During the construction phase there is the potential for effects on agricultural land to increase as result of noise generated by construction activities. The exact construction working methods would not be decided until after approval of the development consent application and as such precise details of mitigation measures have not been defined. The **CoCP** includes a range of measures which could be used to reduce impacts from noise on adjacent receptors, which would limit potential impacts on any livestock present. As such it is considered there is limited potential for inter-relationship effects with noise and vibration.
- 10.6.14 There is the potential for the effects on agricultural land to increase due to effects arising on air quality as construction activities would result in the emission of dust which could be deposited on adjacent agricultural land surrounding the site. This has the potential to result in smothering of vegetation and soil contamination, impacting agricultural productivity. A dust impact assessment was undertaken for the site, as provided in **Appendix 5A** of this volume which identified dust generating activities during the earthworks phase. The risk of dust impacts was determined to be negligible. The **CoCP** outlines the control measures that would be applied on site to reduce the risk of dust impacts such that the residual effect on air quality is considered to be negligible. On this basis, it is considered there is limited potential for effects arising from air quality to increase the effects reported on agricultural land quality.
- 10.6.15 Changes to surface and groundwater flows as a result of construction activities has the potential to increase effects on agricultural land and soils required for reinstatement of land and landscape planting areas (for example altered groundwater regime or flood risk). The **CoCP** outlines measures to be implemented to reduce the risk of hydrological or hydrogeological changes which could affect agricultural land such that the effects are considered to be minor adverse or negligible. The assessment presented in **Chapter 12** of this volume and the **Rail Flood Risk Assessment** (Doc Ref. 5.9) determined that there was no flood risk to surrounding areas and limited impacts on groundwater and as such it is

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considered that there is limited potential for effects arising from groundwater and surface water to increase the effects reported on agricultural quality.

c) Operation

10.6.16 During operation of the proposed development, the land needed for construction would still be required. No additional land would be required beyond that reported for the construction phase, and no further effects on BMV or agricultural land holdings are anticipated.

10.6.17 Other potential impacts include potential for invasive weed species to grow within the site. However, this would be controlled using an appropriate management regime that would minimise the risk of establishment of weeds and remove weed growth that might threaten adjoining agricultural land. The impact during operation is therefore assessed as being of low magnitude which would be a minor adverse effect and **not significant**.

i. Inter-relationship effects

10.6.18 There are anticipated to be inter-relationship effects between geology and land quality; noise and air quality in relation to potential receptors which could be impacted by contamination events or noise or dust affecting adjacent enterprises. Potential impacts would include the contamination of soils and disturbance (noise) and dust. However, given the mitigation measures proposed in relation to these impacts and as it is considered that there would be no additional effects that have not already been assessed within the ES, it is expected that there would be only minor inter-relationship effects on agricultural land and land holdings (**not significant**). Whilst very short duration noise impacts are identified as significant in **Chapter 4** of this volume during operation, as the land is under arable use there are no receptors (such as livestock) which would be affected.

d) Removal and reinstatement

10.6.19 Following the completion of the construction of the Sizewell C Project, the proposed rail extension route would be removed and returned to its original topography, which would maximise the potential for re-use materials.

10.6.20 When the site has been cleared, the area would be returned to its existing use. The methodology for this would be detailed in the SMP as a restoration plan to ensure the land is restored to its previous use. This would be considered to be an impact of very low magnitude and of negligible effect relative to the baseline and **not significant**.

NOT PROTECTIVELY MARKED**i. Inter-relationship effects**

10.6.21 There are anticipated to be inter-relationship effects similar to those identified during the construction phase.

10.7 Mitigation and monitoring**a) Introduction**

10.7.1 Where possible, mitigation measures have been proposed where a significant effect is predicted to occur. Primary and tertiary mitigation measures, which have been accounted for as part of the assessment, are summarised in **section 10.5** of this chapter. Where reasonably practicable, secondary mitigation measures have been proposed.

10.7.2 This section describes the proposed secondary mitigation measures for soils and agriculture.

b) Mitigation

10.7.3 There are no mitigation measures available for the loss of BMV land associated with the proposed development which is assessed as a minor adverse effect. However, whilst a long-term effect, it is temporary, and the land affected by the proposed rail extension route would be returned to agriculture as part of the removal and reinstatement phase.

10.7.4 No secondary mitigation or monitoring measures have therefore been identified as being required for the proposed development in relation to the loss of BMV land.

10.7.5 The impact on the three farm businesses resulting from the loss of agricultural land from production is considered to be **significant**. Further consultation with the land owners will be undertaken to reduce the impacts on the farm businesses, as far as practicable, especially during the construction phase. This will include agreement of assurances and obligations that SZC Co. will accept upon entering the land and compensation, where applicable. This would result in a reduction of the identified high magnitude impacts to low which is assessed as a minor adverse effect and **not significant**.

10.8 Residual effects

10.8.1 **Table 10.8, Table 10.9 and Table 10.10** present a summary of the residual effects identified through the soils and agriculture assessment. They identify the receptor/s likely to be impacted, the level of effect and, where the effect is deemed to be significant, the tables include the mitigation proposed and the resulting residual effect.

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Table 10.8: Summary of effects for the construction phase

Receptor	Impact	Primary or Tertiary Mitigation	Assessment of effects	Additional Mitigation	Residual Effects
BMV land.	Long-term, temporary loss of 8.6ha of Grade 3a land.	None available – noting that the land would be fully restored to agriculture post-operation. Soil handling, storage and re-use would be detailed in a Soil Management Plan (SMP) to ensure the soils are fit for purpose on reinstatement of the land.	Minor adverse (not significant).	None available.	Minor adverse (not significant) – noting that the removal and reinstatement to agricultural use removes this effect.
Land holdings.	Long-term, temporary loss of agricultural land from four land holdings and potential disruption to on-going activities.	Layout has been optimised to limit land take. Level crossing on Buckleswood Road to ensure continued access to fields from this road.	Minor / Moderate adverse (not significant/significant).	Impacts on the farm business resulting from the loss of agricultural land from production would be addressed, as far as practicable, directly with the landowner.	Minor adverse (not significant).

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Table 10.9: Summary of effects for the operational phase

Receptor	Impact	Primary or Tertiary Mitigation	Assessment of effects	Additional Mitigation	Residual Effects
Agricultural holding.	Constraints to land use due to weed growth.	General good maintenance of the site.	Minor adverse (not significant) .	Appropriate weed management as required.	Minor adverse (not significant) .

Table 10.10: Summary of effects for the removal and reinstatement phase

Receptor	Impact	Primary or Tertiary Mitigation	Assessment of effects	Additional Mitigation	Residual Effects
BMV land.	Reinstatement of soils.	Soil handling, storage and re-use would be detailed in a SMP to ensure the soils are reinstated to the original land grade.	Negligible (not significant) .	None	Negligible (not significant) .
Land holdings.	Return of land to agricultural use.	Soil handling, storage and re-use would be detailed in a SMP to ensure the soils are fit for purpose on reinstatement of the land.	Negligible (not significant) .	None	Negligible (not significant) .

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