



The Sizewell C Project

6.5 Volume 4 Southern Park and Ride Chapter 10 Soils and Agriculture

Revision: 1.0
Applicable Regulation: Regulation 5(2)(a)
PINS Reference Number: EN010012

May 2020

Planning Act 2008
Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009



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10. Soils and Agriculture

10.1 Introduction

10.1.1 This chapter of **Volume 4** 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 of the southern park and ride at Wickham Market (referred to throughout this volume as the 'proposed development'). This includes an assessment of potential impacts, the significance of effects, the requirements for mitigation and the residual effects.

10.1.2 Detailed descriptions of the southern park and ride site at Wickham Market (referred to throughout this volume as the 'site'), 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**.

10.1.3 This assessment has been informed by data from other assessments relating to the proposed development, as follows:

- **Chapter 4** of this volume: Noise and vibration.
- **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.
- **Chapter 12** of this volume: Groundwater and surface water.

10.1.4 Furthermore, this assessment has been informed by data presented in the following technical appendices:

- **Appendix 10A** of this volume: Southern Park and Ride Site: Agricultural Land Classification (ALC).

10.1.5 This assessment relates to the following key factors:

- The soil types and related ALC¹ grades likely to be affected by the proposed development.

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

- The type of farm enterprises and farming or land management practices present, including any agri-environment schemes².
- The possible presence of crop, soil or animal diseases or noxious weeds and the risk of spreading such disease or weeds.

10.1.6 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 the removal and reinstatement phases;
- assess the effects of the proposed development on soil, land use and agriculture, taking account of temporary land use requirements and site restoration;
- specify measures, if appropriate, to mitigate potential significant adverse 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.

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.

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 NPS EN-6 requirements, together with consideration of how these requirements have been taken into account in the soils and agricultural assessment is provided in **Volume 1, Appendix 6M** of the **ES**. **Error! Reference source not found.**

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 (NPPF) – this requires planning policies and decisions to recognise the economic and other benefits of the BMV agricultural land, and of trees and woodland (Ref. 10.3).
- 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).
- 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 relating to the soils and agriculture 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.
- 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 agriculture assessment, are set out 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 Volume 11 Environmental Assessment, Section 3, Part 11, LA109 Geology and Soils (Ref. 10.9).
- Natural England Technical Information Note 049 (2012) (Ref. 10.10).
- Defra Construction Code of Practice for the sustainable use of soils on construction sites (Ref. 10.11).
- Good Practice Guide for Handling Soils (Ministry of Agriculture Fisheries and Food, 2000) (Ref. 10.12).
- 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.
- 10.3.4 The scope of this assessment has been established through a formal EIA scoping process undertaken with the Planning Inspectorate (PINS). A request for an EIA Scoping Opinion was initially issued to the PINS in 2014, with an updated request issued in 2019, see **Volume 1, Appendix 6A** of the **ES**.
- 10.3.5 Comments raised in the EIA scoping opinion received in 2014 and 2019 have been taken into account in the development of the assessment methodology. These are detailed in **Volume 1, Appendices 6A to 6C** of the **ES**.
- b) Consultation
- 10.3.6 The scope of the assessment has been informed by 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 that the approach would follow the published guidelines.
- 10.3.7 No consultation with statutory consultees in relation to the scope of the soils and agriculture assessment has been undertaken in relation to soils and agriculture with specific regards to the site.
- c) Study area
- 10.3.8 The study area for the soils and agriculture assessment includes the land required for construction, operation and removal and reinstatement phases of the proposed development. The location and extent of the site is described in **Chapter 1** of this volume.
- 10.3.9 In addition, the assessment of impacts on farm viability takes account of the extent of each affected land holding, so the impact can be considered in the context of the holding.
- 10.3.10 The site is approximately 26 hectares (ha) in size, located north-east of Wickham Market, to the east of the B1078/B1116 and to the north of the A12. Of this, approximately 17.5ha is predominately agricultural land. The remainder of the site encompasses a section of the A12 and an associated slip road.

d) **Assessment scenarios**

10.3.11 The assessment of effects on soils and agriculture includes the assessment of the construction, operation and removal and reinstatement phases of the proposed development, rather than specific assessment years.

10.3.12 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.

e) **Assessment criteria**

10.3.13 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 value or sensitivity of resources and receptors that could be affected, and the magnitude of impacts in order to classify effects.

10.3.14 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.

i. **Sensitivity**

10.3.15 The approach to assigning levels of sensitivity to receptors is summarised in **Table 10.1**.

Table 10.1: 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. BMV land). 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. 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. |

| Value And/Or Sensitivity | Description |
|--------------------------|--|
| | Soils with low wetness limitation affecting workability (Wetness Class II), where drought is not also a limitation. 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). 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. Course textured and stony soils with little potential for structural damage. |

ii. Magnitude

10.3.16 The magnitude of impact is based on the consequences that the proposed development would have upon soils and agricultural receptors. The presence of BMV land is a key factor in the consideration of the sustainability of development proposals as set out in the NPPF. The criteria for the assessment of magnitude are shown in **Table 10.2**.

Table 10.2: Assessment of magnitude of impact on soils and agriculture.

| Magnitude | Criteria |
|-----------|---|
| High | Permanent or long-term loss or degradation of over 50ha of BMV land, or entire regional resource of BMV land (ALC Grades 1, 2, 3a). Loss of >20% of farmed land associated with an agricultural farm holding. Permanent loss of entire area of land under agri-environment or Woodland Grant scheme. No access possible to severed land. Existing land use across land holding would not be able to continue. |
| Medium | Permanent or long-term loss or degradation of 20-50ha of BMV land, or large proportion of regional resource of BMV land. Loss of >10 - 20% of farmed land associated with an agricultural farm holding. 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. 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. |
| Low | Permanent or long-term loss or degradation of 10-20ha of BMV land, or small proportion of regional resource of BMV land. |

| Magnitude | Criteria |
|-----------|---|
| | Loss of >5-10% of farmed land associated with an agricultural farm holding. Short to medium-term reversible loss, or permanent loss of small areas, of land area under agri-environment or Woodland Grant scheme. Access possible to severed land via private ways. 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. |
| Very Low. | Permanent or long-term loss or degradation of <10ha of BMV land. Loss of <5% of farmed land associated with an agricultural farm holding. No severance. Short-term impacts to receptors with no impact on integrity. No material changes to existing land use. |

10.3.17 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.

iii. [Effect definitions](#)

10.3.18 The definitions of effect for agriculture and soils are shown in **Table 10.3**.

Table 10.3: 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 |

10.3.19 Following the classification of an effect as presented in **Table 10.3**, 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.

f) [Assessment methodology](#)

i. [Establishing the baseline](#)

10.3.20 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. play barns).

- 10.3.21 Soil and ALC surveys were undertaken in accordance with published guidelines (Ref. 10.14). Detailed ALC surveys were undertaken in August and October 2016, examining soil properties to a depth of 1.2 metres below ground level (mbgl) (where possible) at 18 locations, see **Appendix 10A** of this volume.
- 10.3.22 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.
- 10.3.23 In addition, the existing landowner for Bridge Farm was interviewed on 18 November 2016. The question pro-forma used in the interview is presented in **Volume 1, Appendix 6M** of the **ES**.

ii. [Assessment](#)

- 10.3.24 The assessment of effects on soils and agriculture includes the following steps:
- 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.
 - Determining the residual effects remaining after additional mitigation.

g) [Assumptions and limitations](#)

- 10.3.25 No assumptions or limitations have been identified in relation to agricultural land quality.
- 10.3.26 Information on land use is based on information publicly available and as provided by landowners.

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 both sands and gravels and superficial diamicton deposits of the Lowestoft Formation (Ref. 10.15).

10.4.4 A full description of the geological characteristics of the site is provided in the geology and land quality assessment, provided in **Chapter 11** of this volume, and the groundwater and surface water assessment, provided in **Chapter 12** of this volume.

ii. Topography and drainage

10.4.5 Land within the site is level, lying at approximately 25 metres (m) Above Ordnance Datum. Gradient and micro topography do not limit ALC grade within the site based on the ALC criteria.

10.4.6 No natural watercourses adjoin the site. A small pond lies within the site boundary to the south of Whin Belt and two small ponds lie to the immediate north-west of the site in the unnamed woodland. Standpipes are present at the east and west edges of the site for crop irrigation.

10.4.7 There is no evidence at the site that it experiences flooding and the site sits within Flood Zone 1 (lowest flood risk) on the Environment Agency Flood Map for Planning. Further details on flood risk are presented in **Chapter 12** of this volume and the **Southern Park and Ride Flood Risk Assessment** (Doc Ref 5.4).

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. These 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.

- 10.4.9 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. Soil types

- 10.4.10 The site comprises predominantly light textured (sandy) soils with some clay loam topsoil and heavy textured (clayey) material at depth (Ref. 10.16), see **Figure 10.1**. The lightest topsoil found at the site had a loamy medium sand texture. Drainage is impeded slightly with the land covered by such soils generally being under arable or grass production.

v. Agricultural land quality and classification

- 10.4.11 Published ALC maps (Ref. 10.17) show the site to be Grade 3 (**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 also be noted that these maps do not distinguish between the Sub-grades 3a and 3b.
- 10.4.12 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 agricultural land within the site in August and October 2016. At the time the ALC survey was carried out, the site was under arable production.
- 10.4.13 **Figure 10.3** illustrates the distribution of ALC grades across the site, determined by the ALC surveys. The agricultural land is in Grades 3a (5.4ha), 3b (7.9ha) and Grade 4 (4.2ha). Approximately 20% of the site comprises land which falls into a BMV category (i.e. Grades 1, 2 and 3a).
- 10.4.14 The ALC grade distribution and the corresponding percentages, are shown in **Table 10.4**.

Table 10.4: Agricultural Land Classification grade distribution.

| ALC Grade | Area (ha) | Area (%) |
|------------------|-------------|------------|
| 1 | 0 | 0 |
| 2 | 0 | 0 |
| 3a | 5.4 | 20.45 |
| 3b | 7.9 | 29.92 |
| 4 | 4.2 | 15.92 |
| 5 | 0 | 0 |
| Non-agricultural | 8.9 | 33.71 |
| Total | 26.4 | 100 |

- 10.4.15** Grade 3a land covers 5.4ha of the site (20.45%). It comprises two soil types with the first running in a band from the south-west (from around the disused pit) up to the north-east. This soil type has light textured topsoil over a clayey subsoil. The clayey subsoil impedes drainage and makes the land occasionally wet (Wetness Class III), but the light textured topsoil lessens the severity of the soil wetness limitation. The dominant limitation is soil droughtiness, with the clayey subsoil’s poor structure restricting plant roots’ ability to access water.
- 10.4.16** The remainder of the Grade 3a area has soils with a medium clay loam topsoil over a heavy clay loam to clay subsoil. The depth at which subsoils become slowly permeable varies leaving the land occasionally to be wet (Wetness Class III to II). Soil droughtiness limits the land to Grade 3a, along with soil wetness where the profile is Wetness Class III. A single point was classified as Grade 2, limited by wetness and droughtiness, as shown on **Figure 10.3**. This cannot realistically be managed as a separate area and has therefore been mapped as Grade 3a in line with the surrounding land.
- 10.4.17** Grade 3b land is found in the northern half of the site. Soil profiles have a light texture, getting lighter with depth, and frequently with a moderately to very stony subsoil. The sandy soil with a high stone content cannot retain a large volume of plant available water resulting in a soil droughtiness limitation to Grade 3b.
- 10.4.18** Grade 4 land is found along the northern and eastern edges of the site. Soil profiles are similar to that described for the Grade 3b land but are lighter textured and/or have a higher stone content. As a result, the land has a stronger soil droughtiness limitation.

10.4.19 The Grade 3a land is found in the same field with Grade 4 land (see **Figure 10.3**) that has a markedly greater soil droughtiness limitation (i.e. the soils ability to hold and release water for crops). Normally arable fields are managed as single blocks. However, when surveyed, the field had been sub-divided with irrigated potato on the Grade 3a and 3b land, and cereal stubble on the Grade 4 land. Had the whole field been under potato, the Grade 4 land would have required more irrigation water to maintain crop quality. The presence of the Grade 4 land therefore impacts on the land manager's ability to exploit the inherent better quality of the Grade 3a land.

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

10.4.20 The agricultural land (approximately 17.5ha) on the site is owned by one farm holding. The farm business occupies approximately 380ha of land split across several units. The primary land use is arable production with a small area under permanent pasture grazed by horses.

10.4.21 The land is irrigated and the cropping on the site is standard combinable crops, with the addition of potatoes and some vegetable crops. Crops are produced under standard farm assured standards with no organic accreditation.

10.4.22 The site is under Higher Level Stewardship³ to 2023, specifically separate corners of nectar mix and wild bird mix cover (**Figure 10.4**). None of the site is under a woodland or forestry grant scheme.

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 development, it is considered there would be no change in the baseline conditions.

³ Higher Level Stewardship is an agri-environment scheme that provides funding to farmers and other land managers in England in return for delivering environmental management on their land

10.4.25 There are no committed development(s) or forecasted changes that would materially alter the baseline conditions within the study area during the construction, operation and removal and reinstatement phases of the proposed development.

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.

b) Tertiary mitigation

10.5.5 Tertiary mitigation will be required regardless of any EIA, as it is imposed, for example, as a result of legislative requirements and/or standard sectoral practices.

10.5.6 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 Ministry of Agriculture Fisheries and Food Good Practice Guide for Handling Soils.

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

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- 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 different soil resources (in particular topsoil and subsoil) are stripped and stored 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 1.2mbgl is sufficient for the reinstatement of agricultural use.
- 10.5.8 The requirements of the Outline Soil Management Plan are included within the **Code of Construction Practice (CoCP)** (Doc Ref. 8.11).
- 10.5.9 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.
- 10.5.10 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.
- 10.5.11 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.
- 10.5.12 All security fencing around the proposed development would be sufficient to resist damage by livestock, and would be regularly checked, and maintained, in a suitable condition. Any damage to boundary fencing would be repaired.
- 10.5.13 Measures contained in relevant Defra and Environment Agency best practice guidance on the control and removal of invasive weed species (Ref. 10.18) 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).

10.5.14 Should animal bones be discovered which may indicate a potential burial site, works would cease and advice sought from the Animal Health Regional Office on how to proceed, relevant to the origin and age of the materials found.

10.5.15 All movement of plant and vehicles between fields would cease in the event of a disease outbreak and official Defra advice 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 development.

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

b) Construction

i. Agricultural land

10.6.3 During construction, the proposed development would result in the temporary, long-term loss of approximately 17.5ha of land from primary agricultural productivity. Approximately 5.4ha (20.45%) of this land is of Grade 3a value, which is considered to be BMV land. The remaining agricultural land temporarily lost is Grade 3b and 4, and land in a non-agricultural use.

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

ii. Land holding

10.6.5 The land includes some irrigated agriculture and land under a Higher Level agri-environmental scheme, as such it is considered to be of high sensitivity.

- 10.6.6 Approximately 17.5ha of land from this holding would be required on a temporary long-term basis. This land would be retained throughout the construction and operation phases, and would be returned and restored to the holding at the culmination of the removal and reinstatement phase.
- 10.6.7 Therefore, there would be temporary, long-term impacts on the agricultural enterprise currently using the site resulting from a long-term loss of land available for production.
- 10.6.8 Approximately 4.6% of the total landholding would be temporarily lost as a result of the construction of the proposed development. It is considered that existing land use across the rest of the holding would be able to continue with minor adjustments required relating to the management required for any replacement land taken. The impact during construction, and throughout the operation and removal and reinstatement phases, is therefore assessed as being of very low magnitude, which would be a minor adverse effect, and **not significant**.
- 10.6.9 There would be a temporary loss of a very small area (in terms of the regional resource of approximately 70,000ha) of land under a Higher Level agri-environment scheme which would be considered to be of very low magnitude, which would be a minor adverse effect and **not significant**.
- 10.6.10 There are no severance impacts associated with the proposed development.

iii. **Inter-relationship effects**

- 10.6.11 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.
- 10.6.12 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 run-off 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 run-off, erosion and pollution. The assessment presented in **Chapter 11** of this volume determined that the risk would 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.

- 10.6.13 In relation to landscape, the ability to create and maintain elements of landscape planting would require soils with appropriate characteristics. The **SMP**, provided in **Volume 2, Appendix 17C** of the **ES**, 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.
- 10.6.14 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 been defined. However, 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, and as such it is considered there is limited potential for inter-relationship effects with noise and vibration.
- 10.6.15 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, 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.
- 10.6.16 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 **Southern Park and Ride Flood Risk Assessment** (Doc Ref 5.4) determined that there was no flood risk to surrounding areas and as such it is considered that there is limited potential for effects arising from groundwater and surface water to increase the effects reported on agricultural quality.

c) Operation

10.6.17 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.

10.6.18 There is the potential for invasive weed species to grow within the site. However, this would be controlled using an appropriate management regime that would remove weed growth that might threaten adjoining agricultural land. The impact during operation is therefore assessed as being of low magnitude on a receptor of low sensitivity which would be a minor adverse effect and **not significant**.

i. Inter-relationship effects

10.6.19 There are anticipated to be inter-relationship effects between noise, air quality, and groundwater and surface water in relation to potential receptors which could be impacted by noise, dust or pollution incidents affecting adjacent land holdings. Potential impacts would include the contamination of soils, disturbance (noise) and dust. However, given the mitigation measures proposed in relation to these disciplines it is expected that there would be only minor inter-relationship effects (**not significant**).

d) Removal and reinstatement

10.6.20 Once the need for the facility has ceased, the buildings and associated infrastructure would be removed, with the re-use of building modules and materials maximised.

10.6.21 When the site has been cleared, the area would be reinstated for agricultural use. The methodology for this would be detailed in the **SMP**.

10.6.22 The reinstatement of the land itself would be considered to be an impact of very low magnitude, and of negligible effect relative to the baseline, and is considered **not significant**.

i. Inter-relationship effects

10.6.23 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. However, the effect of the proposed development is assessed as being a minor adverse effect and **not significant**. Since the area affected is relatively small, and the land would be returned to agriculture following the removal and reinstatement phase, the overall effects are considered to be **not significant**.

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 Whilst the impacts on the land holding are considered to be **not significant**, further consultation with the land owner will be undertaken to reduce the impacts on the farm business, 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.

10.8 Residual effects

10.8.1 **Table 10.5, Table 10.6** and **Table 10.7** present a summary of the residual effects identified through the soils and agriculture assessment. They identify the receptors 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. It is considered that this would reduce the magnitude of impact further, ensuring the impact remains **minor adverse** effect and **not significant**.

10.8.2 As stated in **section 10.7** of this chapter any significant effects to BMV land would be reduced to **not significant** on completion of the removal and reinstatement phase.

Table 10.5: 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 approximately 5.4ha 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 SMP to ensure the soils are fit for purpose on reinstatement of the land. | Minor adverse (not significant). | None proposed. | Minor adverse (not significant). |
| Land holding. | Long-term, temporary loss of 17.5ha of agricultural land and potential disruption to ongoing activities. | Minimisation of disruption or effects to adjacent land. | Minor adverse (not 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). |
| Land under higher level agri-environment scheme. | Long-term temporary loss of small area of land under higher level agri-environment scheme | Optimisation of scheme to minimise land take. | Minor adverse (not significant). | None proposed. | Minor adverse (not significant). |

Table 10.6: 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 10.7: 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 |
| 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 |

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