

11 SOILS AND AGRICULTURAL LAND

Introduction

- 11.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of soils and agricultural land.
- 11.2 This chapter of the ES has been prepared by Land Research Associates Limited (see Appendix 1.2).
- 11.3 This chapter should be read in conjunction with the following appendix, which has been used to inform the assessment:
- Appendix 11.1 Technical Report: Soil Resources and Agricultural Quality

Policy Context

National Planning Policy Frameworkⁱ

- 11.4 The National Planning Policy Framework (NPPF) states in Chapter 15, paragraph 174, that:

'Planning policies and decisions should contribute to and enhance the natural and local environment by:

a. Protecting and enhancing...soils...

b. Recognizing the...economic and other benefits of the best and most versatile land"

Planning Practice Guidance for the Natural Environment

- 11.5 Paragraphs 001 and 002: Planning Practice Guidance for the Natural Environment explain why planning decisions should take account of the value of soils and agricultural land classification (ALC) to enable informed choices on the future use of agricultural land within the planning system.
- 11.6 The Planning Practice Guidance (PPG) indicates at reference 8-001-20190721 that the Agricultural Land Classification (ALC) provides a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system, with direction given to Natural England for further information on ALC.
- 11.7 The guidance also indicates at reference 8-002-21090721 that soils are an essential natural capital asset that provide important ecosystem services, such as a growing medium for food, timber and other crops, a store for carbon and water, a reservoir of biodiversity and a buffer against pollution. Reference is made to the Department for Environment, Food and Rural Affairs' (Defra) Construction Code of Practice for the Sustainable Use of Soils on Construction Sitesⁱⁱⁱ which provides advice on the use and protection of soil in construction projects, including the movement and management of soil resources at all stages of the construction process. The sustainable use and management of soil resources during construction can help with the re-establishment of soil functions following their storage or movement, including food production, habitat provision and support, and natural cycling of elements, such as carbon and nitrogen.

Local Planning Policy

- 11.8 Policy E6 (Rural Economy) of the Barnsley Metropolitan Borough Council (BMBC) Adopted Local Planⁱⁱ states that development in rural areas will be expected to:

'Protect the best quality agricultural land, areas of lower quality agricultural land should be used for development in preference to the best and most versatile land.'

- 11.9 There are no specific policies within the BMBC Adopted Local Plan relating to soils. However, soil protection and management are relevant to the stated aim of policy GI1 (Green Infrastructure), which states that a network of green infrastructure assets will be created that '*Enhances biodiversity and landscape character*'. As a key aspect supporting enhanced natural habitats and landscaping, soil protection and management is an important consideration for meeting biodiversity net gain targets.

Assessment Methodology

Scope of Assessment

- 11.10 There is no nationally agreed methodology for classifying the likely significant effects of development on agricultural land or soils and the approach used in this chapter has been developed over a number of years.

- 11.11 The identified receptors for the Development are:

- Agricultural Land; and
- Soil Resources.

Consultation

- 11.12 An EIA Scoping Report (Appendix 2.1) was submitted to BMBC on 10th October 2022 in support of a formal request for an EIA Scoping Opinion. BMBC adopted their EIA Scoping Opinion on the 25th November 2022 and confirmed that the likely significant effects of the Development on soils and agricultural land is required to be assessed in the ES. There are no specific comments relating to this topic within the Scoping Opinion.

Study Area

- 11.13 The study area comprises the Site as effects on soils do not extend beyond this. The impacts on agricultural land will be limited to the land currently used for agriculture within the Site.

Determining Baseline Conditions

- 11.14 Baseline conditions were assessed by undertaking a detailed survey of soil types and agricultural land grade in January 2023. Full details of the survey methodology and the sources of information used are provided in Technical Appendix 11.1.

Determining the Sensitivity of a Receptor

- 11.15 The sensitivity of affected receptors (soils and agricultural land) has been considered on a scale of high, medium, low or negligible. An explanation of the sensitivity of the receptors can be found in Table 11.1.

Best and most versatile (BMV) agricultural land

- 11.16 The ALC survey provides a statement of the quantity and quality of agricultural land on the Site. 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.

- 11.17 BMV land, defined as Grade 1 to Subgrade 3a in the Agricultural Land Classification system for England and Walesⁱⁱⁱ, is afforded some protection from development in the planning system (see section on Policy context). Grade 1 and 2 quality land is a scarce national resource and regarded as high sensitivity. Subgrade 3a quality land is less scarce both nationally and locally and is regarded as of medium sensitivity. Land of lower agricultural quality (Subgrade 3b, Grade 4 and Grade 5) is not protected in the planning system and therefore considered of low sensitivity.

Soil Resources

- 11.18 The assessment of effects on soils is relatively complicated, given soils are multi-functional resources, with important roles to play in supporting crop production, the carbon and hydrological cycles and as the basis of terrestrial habitats. The approach taken therefore, is to tailor the assessment to the stated deliverables of the Development and maximise the sustainability of resource use.
- 11.19 Soil sensitivity for the Development is judged against the functions that soils would be required to fulfil during the operational phase: permeable coarse or medium-textured subsoils are high quality resources for planting schemes (e.g. to support tree growth) and have a greater function in mitigating the effects of flooding than heavy and slowly permeable subsoils. These resources are therefore regarded as high sensitivity to loss and damage. In some instances, soils have important properties which make them able to support rare habitats (e.g. species diverse calcareous grassland or lowland heath habitats) which are also considered high sensitivity.

Table 11.1: Sensitivity of receptors

Receptor	Sensitivity		
	High	Medium	Low
Agricultural land	Grades 1 & 2	Subgrade 3a	Subgrade 3b and grades 4 & 5
Soil resource	Permeable coarse loamy and medium loamy soils, or other soils capable of supporting valuable habitats	Fine textured or sandy topsoils not capable of supporting valuable habitats Mixed permeable and slowly permeable subsoils.	Damaged or contaminated soils Slowly permeable subsoils

Determining the Magnitude of Change

- 11.20 The magnitude of change has been considered as the change experienced from the baseline conditions at the sensitive receptor and has been considered on a scale of large, medium, small or negligible.

BMV agricultural land

- 11.21 The magnitude of change on best and most versatile land will depend on the amount to be taken by the Development. Article 16, Schedule 5 of the Town and Country Planning (Development Management Procedure) (England) Order 2015^{iv} requires Natural England to be consulted (on behalf of the Secretary of State for the Environment, Food and Rural Affairs) on development that involves the loss of not less than 20 ha of grades 1, 2 or 3a agricultural land. Consequently, the magnitude of losses smaller than this threshold is considered to have a small effect on the national stock of best and most versatile land. Losses of over 80 ha of best and most versatile land are equivalent to the size of a medium to large farm and consequently the magnitude of effect is considered to be large. The judgment-based classification is given in Table 11.2.

Soil resources

- 11.22 Given the nature of the Development, the magnitude of change on soil resources is considered on two aspects; topsoil loss/damage and subsoil compaction as explained below.
- 11.23 The magnitude of change on topsoil resources makes the assumption that, as a valuable finite resource, the requirement should be to protect topsoils from damage. However, since built developments usually generate large surpluses of topsoil, the primary requirement used in this assessment is considered to be that sufficient topsoil should be protected to complete all on-site landscaping/greenspace requirements (provided the baseline resource is suitable for the proposed uses), with a secondary aim of avoiding the generation of 'waste' soil and minimising the removal of soils from site. If all topsoil is protected from damage or loss, the magnitude of change is regarded as

negligible. Large magnitudes of change are considered to arise when there are insufficient resources of suitable quality to complete proposed habitat creation and landscaping.

- 11.24 Subsoil compaction under greenspace areas increases flood risk (and is not typically accounted for in Sustainable Drainage System ('SuDS') design). Severe compaction is also likely to adversely affect the success of landscaping/ecological planting schemes. Magnitude of change is considered as a percentage of the area of the Site. Compaction of greater than 10% of the post-development greenspace area is considered as large magnitude of change as it is likely to result in tangible increases in runoff volumes, of a scale which could affect the efficacy of SuDS design capacity.

Table 11.2: Magnitude of change

Receptor	Large	Medium	Small	Negligible
Agricultural land	Irreversible loss of >80 ha of best and most versatile land	Irreversible loss of 20-80 ha of best and most versatile land	Irreversible loss of 5-20 ha of best and most versatile land	Irreversible loss of <5 ha of best and most versatile land
Soil resources	Loss of >80% of soil resources and insufficient protected for on-site uses. Subsoil compaction of >10% of Site	Loss or irreversible damage to 50-80% of soil resources. Compaction of 5-10% of subsoils	Loss or irreversible damage to <50% of topsoil resources. Compaction of <5% of subsoils	Only minor disturbance of soils within the Site.

Determining the Significance of Effect

- 11.25 The significance of an effect arising from an impact is assessed based on the magnitude of change due to the Development and the evaluation of the sensitivity of the affected receptor. The level of effect has been based on professional judgement and is informed by the matrix provided at Table 11.3.

Table 11.3: Significance matrix

Magnitude of change	Sensitivity of receptor				
		High	Medium	Low	Negligible
Large		Major	Moderate to Major	Minor to Moderate	Negligible
Medium		Moderate to Major	Moderate	Minor	Negligible
Small		Minor to Moderate	Minor	Negligible to Minor	Negligible
Negligible		Negligible	Negligible	Negligible	Negligible

- 11.26 Effects can be both adverse or beneficial. For the purposes of this assessment, effects of Moderate or Major significance are considered as significant in EIA terms.

Limitations and Assumptions

- 11.27 There are not considered to be any limitations relating to the assessment of agricultural land quality or soils.

Baseline Conditions

Agricultural land quality

- 11.28 The Site includes 31.8 hectares (ha) of BMV agricultural land (8.6 ha of land of Grade 2 quality and 23.2 ha of Subgrade 3a). The Site also comprises 40.3 ha of lower quality land (Subgrade 3b). Full details are provided in Appendix 11.1.

Soil resources

- 11.29 The Site has a mixture of soils including permeable loams, topsoils of low nutrient status capable of supporting valuable habitats (high quality resources) as well as slowly permeable heavy soils and disturbed soils.

Future Baseline

- 11.30 The baseline position would not be expected to change in the absence of the Development. Climate change is not anticipated to have any tangible effects on the use of the Site for agriculture or the function of soils.

Likely Significant Effects

Construction Phase

- 11.31 The anticipated effects of construction include the loss of agricultural land, particularly that of BMV quality, and the potential damage to and loss of the soil resource.

Agricultural Land

- 11.32 Construction of the Development will require the use of the agricultural land at the Site. All of the land would be taken out of agricultural production at the beginning of the construction phase which would result in the loss of 8.6 ha of Grade 2 and 23.2 ha of Subgrade 3a agricultural land. This would result in a small magnitude loss of a high sensitivity resource, and medium magnitude loss of a medium sensitivity resource, respectively. Overall, this is judged to be a moderate adverse effect on agricultural land, which is significant.

Soils

- 11.33 Normal construction practice would be to strip and stockpile all topsoils. Failure to separate topsoil resources according to type and quality could result in loss of high quality resources. Inappropriate handling can cause widespread compaction damage, and inappropriate stripping depth can dilute with subsoil. Uncontrolled construction traffic can cause widespread subsoil compaction.
- 11.34 The potential loss and damage of the soil resource due to uncontrolled construction practices could result in a shortfall of soil resources to complete landscaping. This high magnitude loss of mixed high/medium sensitivity soils would be considered a major adverse effect on soils, which is significant.

Operational Phase

- 11.35 As the permanent removal of land from agriculture, and all soil handling operations, would occur during the construction phase of the Development, it is not considered that any further effects would occur following the completion of construction.

Mitigation Measures

Construction Phase

Agricultural Land

- 11.36 No mitigation is available for the direct and permanent loss of agricultural land to built development.

Soils

- 11.37 Mitigation for loss or damage of valuable soil resources will take the form of a site specific Soil Management Plan to be prepared at the detailed design stage and secured by a planning condition. The Soil Management Plan will set out:
- 11.38 How soil resource types (as specified in the technical appendix to this chapter) will be stripped, stockpiled and stored separately;
- 11.39 How soils will be reused in accordance with their suitability for specific landscape uses (as specified in the technical appendix);
- 11.40 Methods of soil handling (e.g. compliant with those in the Defra Code of Conduct for the Sustainable Use of Soils on Construction Sites) including timing of operations; and
- 11.41 Any ameliorative measures (e.g. removal of minor compaction or soil amendment) to ensure soils are fit for specific after uses.

Operational Phase

- 11.42 As all effects are anticipated to occur during the construction phase of the Development, no mitigation measures are required in the operational phase.

Residual Effects

Construction Phase

Agricultural land

- 11.43 As there is no additional mitigation the residual effect would remain as loss of 8.6 ha of Grade 2 and 23.2 ha of Subgrade 3a agricultural land (i.e. the same as the assessed likely effects).

Soils

- 11.44 Following appropriate mitigation, sufficient soil of suitable quality should be available to support landscaping and habitats and the residual effect will be negligible, which is not significant.

Operational Phase

- 11.45 As all of the effects and mitigation measures on soils and agricultural land will occur in the construction phase of Development, there are no operational residual effects on agricultural land or soils.

Cumulative Effects

- 11.46 The effects on agricultural land are only relevant to land within the Site; there are not judged to be any relevant cumulative effects on these receptors.

Summary

- 11.47 A detailed soils and agricultural land quality of the Site has been conducted, showing the site to contain an area of 31.8 ha of Best and Most Versatile quality land (and 40.3 ha of lower quality land) and mixed soil resources of variable quality for reuse. No mitigation for the loss of agricultural land to built development is possible and the effects of the Proposed Development are judged moderately adverse. The soils could be lost or damaged during construction, but mitigation in the form of a site-specific Soil Management Plan which separates and protects soils resources for reuse in accordance with the findings would ensure there are sufficient quality soil resources to support landscaping proposals.

11.48 Table 11.4 contains a summary of the likely significant effects of the Development.

Table 6.15: Table of Significance – Soils and Agricultural Land

Potential Effect	Nature of Effect (Permanent/ Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	B	L	
Construction											
Loss of agricultural land	Permanent	Moderate adverse	None possible								Moderate adverse
Loss of or degradation of soil resource	Permanent	Major adverse	Site specific Soil Management Plan (to be secured by planning condition)								Negligible
Completed Development											
N/A											
Cumulative Effects											
<i>Construction</i>											
N/A											
<i>Completed Development</i>											
N/A											

* Geographical Level of Importance

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

REFERENCES

- ⁱ National Planning Policy Framework (2023) Department for Levelling Up, Housing and Communities (available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NP_PF_Sept_23.pdf)
- ⁱⁱ Barnsley Metropolitan Borough Council Local Plan (available at: <https://www.barnsley.gov.uk/media/17249/local-plan-adopted.pdf>)
- ⁱⁱⁱ Maff (1988). Agricultural Land Classification of England and Wales: revised guideline and criteria for grading the quality of agricultural land.
- ^{iv} Town and Country Planning (Development Management Procedure) (England) Order 2015. Accessed online at: The Town and Country Planning (Development Management Procedure) (England) Order 2015 ([legislation.gov.uk](https://www.legislation.gov.uk)). Accessed March 2022.