The Sizewell C Project

6.3 Volume 2 Main Development Site

Chapter 17 Soils and Agriculture
Appendices 17A - 17C

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VOLUME 2, CHAPTER 17, APPENDIX 17A: AGRICULTURAL LAND CLASSIFICATION

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Figures

None provided.

Plates

None provided.

Appendices

1. Agricultural Land Classification for Main Development Site

1.1 Executive summary

1.1.1 An assessment of agricultural land quality, involving a desktop study and a detailed Agricultural Land Classification (ALC) survey, has been undertaken to determine the quality of agricultural land at the proposed main development site for Sizewell C. The assessment was undertaken in accordance with the ALC system for England and Wales, October 1988 ('the ALC Guidelines').

1.1.2 The collation and review of historical data and a detailed ALC survey found agricultural land in Grades 2 (3.9 hectares (ha)), 3a (18.3ha), 3b (66.44a) and 4 (110.9ha) along with a large area of non-agricultural land (157.8ha). Grade 2 and 3a land (covering approximately 6% of the site) are considered to be among the best and most versatile agricultural land in England and Wales.

1.1.3 A total of 14.4ha of the site was not surveyed.

1.2 Introduction

1.2.1 This report presents an assessment of agricultural land quality (ALC) at the proposed main development site (hereafter referred to as the proposed development) for Sizewell C. The purpose of this report is to present details of the agricultural land quality at the site. This report has been prepared by Arcadis on behalf of EDF Energy.

1.2.2 The location and extent of the site is shown on **Figure 17.1 attached to the Environmental Statement (ES) chapter**. The site is 371.7 ha in size and is located on the coast to the east of Leiston.

1.3 Agricultural land planning policy and context

1.3.1 This ALC assessment is consistent with the direction given by the National Planning Policy Framework[1] (NPPF). Paragraph 170 of the NPPF states:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by: recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the*

[1] National Planning Policy Framework. Department for Communities and Local Government, February 2019 https://www.gov.uk/government/publications/national-planning-policy-framework--2

economic and other benefits of the best and most versatile agricultural land.

1.3.2 A footnote to this adds that:

Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality".

1.3.3 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).

1.3.4 Grades 1, 2 and 3a are defined as the best and most versatile land.

1.3.5 The site falls within the administrative area for the Suffolk Coastal District Local Plan. The Core Strategy for this district was adopted in July 2013. Until replaced by policies from new site allocation and area-specific policy documents[2], the Council will continue to apply policy saved from the preceding Local Plan. However, Policy AP11: Agricultural Land and Commercial Woodlands, was not saved. In the absence of an extant local planning policy related to best and most versatile land, guidance reverts to the NPPF.

1.4 Agricultural Land Classification methodology

a) Ministry of Agriculture Fisheries and Food Agricultural Land Classification system

1.4.1 The Ministry of Agriculture Fisheries and Food ALC[3] system of grading land quality for use in land use planning purposes divides farmland into five grades according to the degree of limitation imposed upon land use by the inherent physical characteristics of climate, site and soils. As detailed above, Grade 1 land is of an excellent quality, whilst Grade 5 land has very severe limitations for agricultural use.

[2] Suffolk Coastal Core Strategy Adopted July 2013 http://www.eastsuffolk.gov.uk/planning/local-plans/suffolk-coastal-district-local-plan/

[3] Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land. Ministry of Agriculture Fisheries and Food, October 1988. http://archive.defra.gov.uk/foodfarm/landmanage/land-use/documents/alc-guidelines-1988.pdf

1.4.2 Published ALC maps show the land within the site boundary to comprise a mix of Grades 3 and 4, as well as non-agricultural land. 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.

1.4.3 Some of the proposed development site has semi-detailed survey information available. This data was critically reviewed to assess its applicability to the full assessment of impacts on agricultural land (see **Annex 17A.1**).

1.4.4 The available data was based on a semi-detailed survey; i.e. one sample point per 2ha rather than a detailed survey (i.e. one sample point per 1ha).

1.4.5 Further information was required to verify the ALC grading according to soil droughtiness. In particular, the topsoil and subsoil were identified in the semi-detailed survey as 'loamy sand', but for ALC proposes there is a significant difference between Loamy Fine Sand (LMS), Loamy Medium Sand (LMS) and Loamy Coarse Sand (LCS).

1.4.6 Therefore, more information was required regarding the texture of loamy sand and sand (i.e. is it fine, medium or coarse – as specified in Appendix 2 'Soil Texture' of ALC Guidelines). As such samples were collected for laboratory analysis of topsoil and subsoil for particle size distribution i.e. clay, silt and sand (fine, medium, and coarse) to confirm the grades presented. Based on this additional data it was possible to confirm land grades as presented in the existing semi-detailed survey results.

1.4.7 Where there was no existing detailed or semi-detailed survey information, a detailed ALC survey was undertaken in 2016 and 2019.

1.4.8 The detailed survey involved examination of the soil's physical properties at 127 locations on a 100 metre (m) by 100m grid. The grid reference of the sample locations was recorded to enable these to be relocated for verification, if necessary.

1.4.9 At each location, the soil profile was examined to a maximum depth of approximately 1.2m by hand with the use of a 5 centimetre diameter Dutch (Edleman) soil auger. A number of soil pits were excavated at selected locations with a spade in order to examine the physical soil profile characteristics, including subsoil structure, of the main representative soil types. Auger logs are presented in **Appendix 17A2**.

1.4.10 The soil profile at each sample location was described using the Soil Survey Field Handbook: Describing and Sampling Soil Profiles[4]. Each soil profile was ascribed an ALC grade following the Ministry of Agriculture Fisheries and Food ALC Guidelines.

1.4.11 These Ministry of Agriculture Fisheries and Food guidelines require that the following factors be investigated:

- Climate: Average Annual Rainfall and Accumulated Temperature above 0°C between January and June;
- Site: Gradient, Micro Relief and Flooding;
- Soils: Texture, Structure, Depth, Stoniness, and Chemical Toxicity; and
- Interactive Factors: Soil Wetness, Soil Droughtiness and Liability to Erosion.

1.4.12 To confirm soil texture a topsoil sample was collected from 1 auger location and sent to an accredited laboratory for particle size distribution analysis. The data sheet is included as **Annex 17A.3**.

b) Natural England technical advice note 049

1.4.13 Use of the ALC methodology is also supported by Natural England Technical Advice Note 049[5] (TIN049), published in 2012.

1.4.14 TIN049 describes a detailed ALC survey as having approximately one sample point per hectare. To achieve this sample density and to remove surveyor selection bias, as noted above, sample points were set at 100m intersections aligned with the national grid, located in the field by handheld GPS.

1.5 Agricultural Land Classification assessment

a) Climate

1.5.1 Climatological data for ALC are provided for 5 kilometres intersections of the National Grid by the Meteorological Office, in collaboration with the National Soil Resources Institute. The data from these points can be interpolated providing climate data for specific sites. Interpolated data for the proposal site is given in **Table 1.1**.

[4] Soil Survey Field Handbook: Describing and Sampling Soil Profiles' (Ed. J.M. Hodgson, Cranfield University, 1997).
[5] Agricultural Land Classification: protecting the best and most versatile agricultural land (TIN049). Natural England, 2012. http://publications.naturalengland.org.uk/publication/35012

Table 1.1: Main Development Site ALC climate data.

Reference Point.	National Grid Reference TM 407 702.
Altitude (m).	15
Average Annual Rainfall (millimetre (mm)).	571
Accumulated Temperature (day degrees).	1441
Moisture Deficit for wheat (mm).	127
Moisture Defecit for potatoes (mm).	125
Field Capacity Days FCD.	102

1.5.2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall as a measure of overall wetness, and accumulated temperature as a measure of the warmth in the growing season.

1.5.3 Climate does not impose an overall limitation on ALC grade at this site. Climate does, however, have an important influence on the interactive limitations of soil wetness and soil droughtiness. The site has both relatively low rainfall and a long growing season, acting to decrease the severity of any potential soil wetness limitation, but increasing the severity of any potential soil droughtiness limitation.

b) The site

1.5.4 The extent of the site is shown on **Figure 17.3**.

c) Soils and parent materials

1.5.5 The British Geological Survey Geology of Britain Viewer[6] shows the site to be underlain by an area within the Crag Group (quaternary sand), which in places is overlain with drift deposit of Lowestoft Formation comprising sand and gravel.

d) Interactive factors

1.5.6 The majority of the site comprises deep well drained sandy soils belonging to the Newport Soil Association (representing a group of soil types which are typically found occurring together in a landscape). The main land use on these soils is defined as being cereals and sugar beet, some carrots and potatoes with some coniferous woodland and lowland heath habitats.

[6] British Geological Survey Geology of Britain viewer.
http://www.bgs.ac.uk/data/mapViewers/home.html?src=topNav

1.5.7 Along the coastal strip the soils comprise deep well drained calcareous and non-calcareous sandy soils belonging to the Sandwich Soil Association. The main land use on these soils where they occur is described as being sand dune and wetland habitats; recreation; coniferous woodland; some gravel extraction, with limited potential for agriculture.

1.5.8 Along the western and southern extent of the site the soils comprise deep well drained fine loamy over clayey soils belonging to the Melford Soil Association. The main land use on these soils is described as being cereals, sugar beet and other arable crops.

1.5.9 In the low-lying land associated with Sizewell belts the soils comprise either deep stoneless non-calcareous and calcareous clayey soils (belonging to the Wallasea Soil Association) or deep peat soils associated with clayey over sandy soils, in part very acid (belonging to the Mendham Soil Association).

1.5.10 The main land use on these soils where they occur is described as being winter cereals, sugar beet, potatoes and permanent grassland.

e) Agricultural Land Classification grade distribution

1.5.11 Land within the proposal site comprises a mix of Grades 2, 3a, 3b and 4, as well as non-agricultural land.

1.5.12 The extent of ALC grades across the site shown on **Figure 17.3**, with area measurements given in **Table 1.2**.

Table 1.2: ALC grade distribution.

ALC Grade.	Area (ha).	Area (%).
Grade 2.	3.9	1.05
Grade 3a.	18.3	4.92
Grade 3b.	66.4	17.87
Grade 4.	110.9	29.84
Non-agricultural	157.8	42.45
Not Surveyed.	14.4	3.87
Total	**371.7**	**100.00**

1.5.13 Grade 2 land covers approximately 1% of the site, an area of 3.9ha, comprising soils with a number of key characteristics. It comprises a comparatively small area of sandy loam topsoils and upper subsoils overlaying sandy lower subsoils. All of the land falling within Grade 2 has a light to medium textured non-calcareous topsoil overlaying a light

textured free draining subsoil. The land is never waterlogged (Wetness Class I) and limited to Grade 2 by soil droughtiness.

1.5.14 Grade 3a land covers approximately 5% of the site, an area of 18.3ha, comprising soils with medium sandy loam topsoils over subsoil layers incorporating sandy loam and clay loam horizons. These profiles do not experience waterlogging (Wetness Class I) and are limited to Grade 3a by droughtiness.

1.5.15 Grade 3b land covers approximately 18% of the site, an area of 66.4ha, comprising soils with coarser textures than the Grade 3a soils. These profiles do not experience waterlogging (Wetness Class I) but are more severely limited by droughtiness.

1.5.16 Grade 4 land covers approximately 30% of the site, an area of 110.94ha. Soil profiles in all areas of Grade 4 generally comprise loamy sand topsoil over loamy sand upper subsoils and sandy subsoils. In some areas the profile is impenetrable due to flints below the upper subsoil. All of the land falling within Grade 4 has a light to medium textured non-calcareous topsoil overlaying a medium to light free draining subsoil. The land is generally never waterlogged (Wetness Class I) and limited to Grade 4 by soil droughtiness due to the free draining nature of the profiles.

1.5.17 Non-agricultural land comprises the majority of the proposed development, approximately 42%, an area of 157.8ha. The foreshore to the east of Sizewell A and B consists of made ground associated with previous development and coastal sand dune and dune slack. North of this are the Sizewell Marshes Site of Special Scientific Interest and to the west commercial forestry.

1.6 Conclusions

The collation and review of historical data and a detailed ALC survey found agricultural land in Grades 2 (3.9ha), 3a (18.3ha), 3b (66.4ha) and 4 (110.9ha) along with a large area of non-agricultural land (157.84). Grade 2 and 3a land (covering approximately 6% of the site) are considered to be among the best and most versatile agricultural land in England and Wales.

APPENDIX 17A1: SIZEWELL C ALC REVIEW

Review of Agricultural Land Classification:

UK EPR Sizewell
Agricultural Land Classification

Prepared for:
Hyder Consulting

On behealf of:
EDF

Prepared by:
R W Askew BSC(Hons) MSc MISoilSci CSci
Askew Land and Soil Ltd

Date:
25th February 2015

Project Number:
C346

Contract/Proposal No:	C346
Issue:	2
Author:	Rob Askew
Date:	25th February 2015

Our interpretation of the site characteristics is based on available data made during our desktop study and soil survey. This desktop study and soil survey has assessed the characteristics of the site in relation to the assessment of its Agricultural Land Classification. It should not be relied on for alternative end-uses or for other schemes. This report has been prepared solely for the benefit of Hyder Consulting/EDF. No warranty is provided to any third party and no responsibility or liability will be accepted for any loss or damage in the event that this report is relied upon by a third party or is used in circumstances for which it was not originally intended.

Version Control Record

Issue	Description of Status	Date	Initials
A	First Draft	18/02/2015	RWA
1	First Issue	18/02/2015	RWA
2	Second Issue	25/02/2015	RWA

CONTENTS

APPENDICES

1 INTRODUCTION

1.1 Background

1.1.1 This report sets out the findings of a review of an Agricultural Land Classification (ALC) survey and report in connection with land at UK EPR Sizewell, Suffolk ('the Site'). The ALC report was produced by AMEC on behalf of EDF on 1st February 2011. The ALC report concludes that the agricultural land at the Site comprises predominately of Subgrade 3b, with a small amount of Grade 4. A copy of the ALC report is attached at Appendix A.

1.1.2 This review is based on a bespoke set of review criteria which assesses the ALC report against the 'Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land', published by the Ministry for Agriculture, Food and Fisheries (MAFF)[1] in October 1988 (henceforth referred to as the 'the ALC Guidelines')[2]. This review also considers current best practice for ALC set out in Natural England's Technical Information Note 049 (a copy of which is given as Appendix B).

1.1.3 A conclusion on the robustness of the ALC Report against the ALC Guidelines and current best practice is given at the end of this review.

1.2 Methodology

1.2.1 This review has been carried out by a Chartered Scientist, who is a Member of the Institute of Professional Soil Scientists (IPSS). The IPSS is the chartered and professional body of the British Society of Soil Science (BSSS). In addition, this review has been carried out by a soil scientist who meets the requirements of the IPSS Professional Competency Scheme for ALC (see IPSS PCSS Document 2 'Agricultural Land Classification of England and Wales', given as Appendix C). The IPSS Professional Competency Scheme is endorsed, amongst others, by the Department for Environment, Food and Rural Affairs (Defra), Natural England, the Science Council, and the Institute of Environmental Assessment and Management (IEMA) (see Appendix C also).

1.2.2 The ALC system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The ALC system divides agricultural land into five grades (Grade 1 '*Excellent*' to Grade 5 '*Very Poor*'), with Grade 3 subdivided into Subgrade 3a '*Good*' and Subgrade 3b '*Moderate*'. Agricultural land classified as Grade 1, 2 and Subgrade 3a falls in the '*best and most versatile*' category in Paragraph 112 and Annex 2 of the National Planning Policy Framework (NPPF) of March 2012.

[1] The Ministry of Agriculture, Fisheries and Food (MAFF) was incorporated within the Department for Environment, Food and Rural Affairs (Defra) in June 2001

[2] Ministry of Agriculture, Fisheries and Food (October 1988) 'Agricultural land Classification of England and Wales: Revised Guidelines and Criteria for Assessing the Quality of Agricultural Land'. Available online @ http://archive.defra.gov.uk/foodfarm/landmanage/land-use/documents/alc-guidelines-1988.pdf

Further details of the ALC system and national planning policy implications are described in Natural England's Technical Information Note 049 (Appendix B).

1.2.3 As set out in the ALC Guidelines, the principal physical factors influencing agricultural production are (i) climate, (ii) site, and (iii) soil. These factors together with the interactions between them form the basis for classifying land into one of the five grades. Importantly, the grade or subgrade is determined by the ***most limiting factor present***.

1.2.4 As set out in Natural England's Technical Information Note 049 (Appendix C),

'ALC surveys are undertaken, according to the published Guidelines, by field surveyors using handheld augers to examine soils to a depth of 1.2 metres, at a frequency of one boring per hectare for a detailed assessment. This is usually supplemented by digging occasional small pits (usually by hand) to inspect the soil profile. Information obtained by these methods is combined with climatic and other data to produce an ALC map and report. ALC maps are normally produced on an Ordnance Survey base at varying scales from 1:10,000 for detailed work to 1:50 000 for reconnaissance survey.'

1.3 Structure of the Remainder of this Report

1.3.1 The remainder of this report is structured as follows:

- Section 2 – Review of Agricultural Land Classification; and
- Section 3 – Summary and Conclusions.

2 REVIEW OF AGRICULTURAL LAND CLASSIFICATION

2.1 Background

2.1.1 As described in the ALC Guidelines, the main physical factors influencing agricultural land quality are:

- climate;
- site;
- soil; and
- interactive limitations.

2.1.2 These factors, together with a consideration of the qualifications of the surveyor, and methodology for conducting and reporting the ALC survey in the light of current best practice (see Section 1 of this review and Appendix B), are considered in turn in the checklist below.

2.1.3 Where the ALC Review Criterion does not meet the requirements of the ALC Guidelines, and/or meet the expectations of current best practice (as described in Section 1 and Appendix B), a commentary is given below the checklist. Where more information is required to assess the ALC grading, the information gap is identified.

2.2 ALC Review Checklist

Table 1: ALC Review Checklist

ALC Review Criteria	**Information from ALC Report Under Review**	**Does ALC Criterion Meet Requirements of the ALC Guidelines and/or meet Best Practice (Yes/No), or is More Information Required?**
Preliminaries/Overview		
1. Qualifications of ALC Surveyor / Author	The report identifies S Ross as the author and J Baker as Approver, but does not give the qualifications of the author / reviewer?	Not known if the surveyors are qualified soil scientists and/or ALC surveyors, or whether they are

		geotechnical specialists? **More Information Required**
2. Has an appropriate level of ALC survey been undertaken?	Re. paragraph 2.1: 143 sample locations over 311 ha site (i.e. almost one sample point per 2 ha of land surveyed).	Yes at semi-detailed level of survey (this is not a detailed survey)
3. Has an intrusive soil survey been carried out to examine soil profiles to a depth of 1.2m with a hand held auger / spade?	ALC survey involving Dutch auger and spade	Yes
4. Has a suitable log of soil profiles examined on site been provided?	Appendix A – Soil profile logs	Yes
5. Have any soil pits been excavated and examined and are soil pits descriptions provided?	Appendix D – Representative soil profiles per main soil types	Yes
6. Is a map of sample locations provided at a suitable scale?	Figure 1 - Auger Location Plan (1:12,500)	Yes (Semi-detailed Survey)
7. Is a map showing the distribution of the ALC grades provided at an appropriate scale?	Figure 3 - Agricultural Land Classification Grades and Other Land Uses (1:12,500)	Yes (Semi-detailed survey
Physical Factors Influencing ALC		
8. Climate		
(i) Has interpolated climate data for ALC been provided for National Grid	Re. Table 1 (page 8). ALC climate data provided, but no OS grid reference of altitude given? However, ALC climate data for TM 452 645 @ 17 mAoD	Yes

	Reference (NGR) on site (re Appendix 1 of the ALC Guidelines)?	produced for this review is similar to data in Table 1: NRG TM 452 645 ALT 17m AAR 588mm AT0 1423 MDM WHT 124mm MDM POT 121mm FCD 105 Best Grade 1	
(ii)	Has significant climate variability due to different altitudes above Ordnance Datum (AOD) within site boundary been considered?	Due to large study area, it would have been preferable to have used several ALC climate data points, rather than just one.	No
(iii)	Has grade according to climate been assessed appropriately?	No overall climate limitation	Yes
9. Site			
(i)	Gradient: has gradient been appropriately assessed, e.g. clinometer/Abney Level and ranging poles?	No gradient limitation.	Yes
(ii)	Micro-relief: has micro-relief been	No micro-relief limitation (assumed).	Yes

assessed appropriately?		
(iii) Risk of flooding: has the risk of flooding been assessed appropriately?	Agricultural land quality limitation due to flood risk not detailed in report. However, no agricultural land falls in Environment Agency Flood Risk Zone, and no significant flood risk is assumed.	Yes
10. Soil		
(i) Soil Depth: has grade according to soil depth been assessed appropriately?	No limitation due to limited soil depth.	Yes
(ii) Soil Stoniness: has grade according to stoniness been assessed appropriately? If stoniness is significant, how was stone content assessed (field estimate and /or sieving)?	No limitation due to stoniness *per se*, but stone content is considered in soil droughtiness assessment. Stone content estimated in field, rather than laboratory / use of sieves.	Yes
(iii) Chemical Limitations: If there are any chemical limitations (e.g. toxicity), have these been assessed appropriately?	No chemical limitations identified.	Yes
11. Interactive Limitations		
(i) Soil Wetness: has soil wetness been assessed appropriately in	Soil wetness is not identified as a main limiting factor to agricultural land quality at the Site. Considering light (sandy)	Yes

	accordance with Appendix 3 of the ALC Guidelines?	nature of main soil types (c.f. Newchurch 4 Association), this seems reasonable.	
(ii)	Soil Droughtiness: has soil droughtiness been assessed appropriately, e.g. have soil drought calculations (re Appendix 4 of the ALC Guidelines) been provided?	Soil droughtiness is stated to be the main limiting factor to agricultural land quality at the Site. Soil moisture balance calculations have been provided in Appendix E. However, for ALC droughtiness calculations, there is a significant difference between Loamy Fine Sand (LMS), Loamy Medium Sand (LMS) and Loamy Coarse Sand (LCS). This review has considered Auger 3 (Appendix A). Drought calculations for (i) LFS topsoil and subsoil over fine sand would give ALC Grade 2 due to drought (i.e. MB Wheat = 20mm, and MB Potatoes = 8mm) , and (ii) LMS topsoil and subsoil over MS would give Subgrade 3b for wheat (i.e. MB Wheat = -25mm) and Subgrade 3a for potatoes (i.e. MB Potatoes = -20mm). See soil moisture balance (MB) calculations given as Appendix D.	More Information Required – texture of loamy sand and sand (i.e. is it fine, medium or coarse – as specified in Appendix 2 'Soil Texture' of ALC Guidelines).
(iii)	Soil Erosion: has the risk of soil erosion been assessed appropriately?	No limitation due to risk of soil erosion has been identified. Due to absence of slope/gradient limitations, this seems appropriate.	Yes

2.3 Commentary and Request for Further Information

2.3.1 The AMEC ALC report has provided most of the soil data required for an ALC survey following the ALC Guidelines (October 1988) and current best practice (see Appendix B of this report). The ALC survey is a semi-detailed (i.e. one sample point per 2 ha) rather than a detailed survey (i.e. one sample point per 1 ha).

2.3.2 More information is required in order to verify the ALC grading according to soil droughtiness; in particular the topsoil and subsoil is identified as 'loamy sand', but for ALC proposes there is

a significant difference between Loamy Fine Sand (LMS), Loamy Medium Sand (LMS) and Loamy Coarse Sand (LCS).

2.3.3 This review has considered Auger 3 (Appendix A). Drought calculations made as part of this review have determined that (i) LFS topsoil and subsoil over fine sand would give ALC Grade 2 due to drought, and (ii) LMS topsoil and subsoil over MS would give Subgrade 3b for wheat (3a for potatoes).

2.3.4 Therefore more information is required regarding the texture of loamy sand and sand (i.e. is it fine, medium or coarse – as specified in Appendix 2 'Soil Texture' of ALC Guidelines). This would inevitably require some laboratory analysis of topsoil and subsoil for particle size distribution (PSD), i.e. clay, silt and sand (fine, medium, and coarse). It would also be prudent to measure soil stone content by sieving samples of topsoil and subsoil in order to be more precise.

3 SUMMARY AND CONCLUSIONS

3.1.1 This report sets out the findings of a review of an Agricultural Land Classification (ALC) survey and report in connection with land at UK EPR Sizewell, Suffolk ('the Site'). The ALC report was produced by AMEC on behalf of EDF on 1st February 2011. The ALC report concludes that the agricultural land at the Site comprises predominately of Subgrade 3b, with a small amount of Grade 4 (a copy of the AMEC ALC report is given as Appendix A.

3.1.2 The review is based on a bespoke set of review criteria which assesses the ALC report against (i) the 'Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land', published by the Ministry for Agriculture, Food and Fisheries (MAFF) in October 1988 (henceforth referred to as the 'the ALC Guidelines'), and (ii) current best practice for ALC provided in Natural England's Technical Information note 049 (a copy of which is provided as Appendix B).

3.1.3 The ALC survey and report has followed the ALC Guidelines and current best practice closely. The majority of the principal physical factors which influence the quality of agricultural land (as set out in the ALC Guidelines) have been assessed appropriately and reported in sufficient detail.

3.1.4 More information is required in order to verify the ALC grading according to soil droughtiness; in particular, the topsoil and subsoil is identified as 'loamy sand', but for ALC proposes there is a significant difference between Loamy Fine Sand (LMS), Loamy Medium Sand (LMS) and Loamy Coarse Sand (LCS).

3.1.5 Therefore more information is required regarding the texture of loamy sand and sand (i.e. is it fine, medium or coarse – as specified in Appendix 2 'Soil Texture' of ALC Guidelines). This would inevitably require some laboratory analysis of topsoil and subsoil for particle size distribution (PSD), i.e. clay, silt and sand (fine, medium, and coarse). It would also be prudent to measure soil stone content by sieving samples of topsoil and subsoil in order to be more precise.

Appendix A:
UK EDP Sizewell
Agricultural Land Classification (01/02/2011)

Date: 1st February 2011

Our Ref: 15930/TR/00059
Your Ref:

EDF

Direct tel +44(0)1352 751 761
Direct fax +44(0)1352 751 451
Email: giles.bishop@amec.com

For the attention of Charlotte Virally

Dear Charlotte,

Subject: CIDEN 003 Deliverables

We are pleased to provide the technical report entitled Agricultural Land Classification at Sizewell, Suffolk. The report is issued in PREL A status (Issue 01).

The document has been uploaded to EDF Groupnet in PDF format to the zip file named *"15930TR00059 Sizewell ALC Report Prel A 01.02.11"* to the following location:

> *"Folders/WDE-UKE (UK EPR)/07b- SITE DEVELOPMENT SIZEWELL/7.4 Deliverables - Outputs/20- EIA & ES/ 03 - Land Use and Soils"*

Please note figures have been designed for printing out and that their appearance on a computer screen is not an acceptable representation

We would be grateful for your comments on this technical report. AMEC will address your comments and provide an amended version, as required.

Yours sincerely,

Giles Bishop
Responsible Engineer

cc:
EDF – Isabelle Ducher-Peron, Claire Maury, Emmanuelle Chardon, Christine Blythe
AMEC – Hilary Drinkwater, Sheila Ross, Una Maginn

A	**01.02.11**	**S Ross**	**U Maginn**	**Prel**	**Preliminary Report for EDF review**	**J Baker**
Revision	**Date**	**Prepared by**	**Checked by**	**Status**	**Reasons for revision**	**Approved by**

EDF ***DIRECTION PRODUCTION INGENIERIE***	1st partner	2nd partner

UNIQUE REFERENCE NUMBER **15930/TR/00059**	SUPPLIER WBS CODE

SUPPLIER COMPANY TRADE NAME

AMEC

EDF-SUPPLIER CONTRACT NR CIDEN 003	ITEM NUMBER	ELEMENTARY SYSTEM	BUILDING

SCALE	**LINE/SERIE/SITE**	**Safety Classified**
N/A	**NUCL/REP/EPR/UKEPR/SZC**	**Yes** ☐ **No** ■

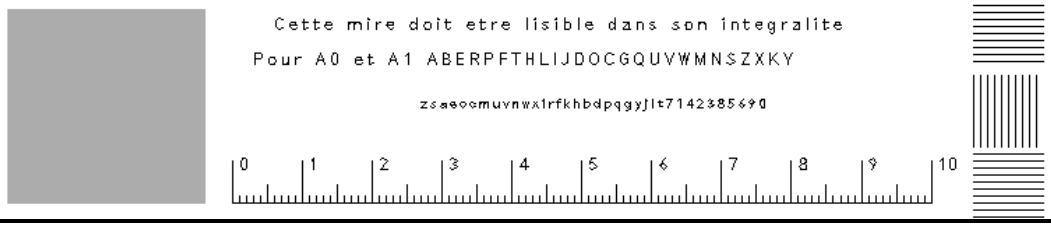
FORMAT
A4

DOCUMENT TITLE :

Agricultural Land Classification at Sizewell, Suffolk

DOCUMENT TYPE :	**DOCUMENT CLASSIFICATION CODE**	**PAGE**
Report		1/60

SUBCONTRACTOR COMPANY TRADE NAME	**SUBCONTRACTOR INTERNAL IDENTIFICATION NR**



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UK EPR Sizewell Agricultural Land Classification

Report Number 15930/TR/00059
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Issue	Description of Amendment	Author(s) / Originator	Checker	Approver	Date
A	15930/TR/00059 Preliminary Report for Client Review	S Ross [redacted]	U Maginn	J Baker	01.02.11

Numbers of pages	**Introductory**	6	**Text**	12	**Appendices**	7
Number of Tables	2		**Number of Figures**		3	

Previous issues will be destroyed or marked 'SUPERSEDED'.

Contents

Figures

Tables

Abbreviations and Acronyms

ADAS	Agricultural Development Advisory Service
ALC	Agricultural Land Classification
BMVL	Best and Most Versatile Land
Defra	Department of Agriculture, Farming and Rural Affairs
EA	Environment Agency
EIA	Environmental Impact Assessment
MAFF	Ministry of Agriculture, Fisheries and Food
MAGIC	Multi-Agency Geographic Information for the Countryside
PPS	Planning Policy Statement
SSEW	Soil Survey of England and Wales
SSLRC	Soil Survey and Land Research Centre, now the National Soil Resources Institute (NSRI), part of Cranfield University
SSSI	Site of Special Scientific Interest
WC	Soil Wetness Class (according to MAFF (1988) (Ref 1))
UXO	Unexploded Ordnance

Executive Summary

This report provides the results of a field survey of soils and Agricultural Land Classification at Sizewell, Suffolk. The total area of land surveyed was approximately 311 hectares, including areas of arable land, forestry, peatland, sand dunes and made ground immediately north of the Sizewell B power station.

The purpose of the report is to inform the Environmental Impact Assessment which will accompany the Planning Application for the proposed Sizewell C power station.

Field surveys indicate that there are three main soil types within the study area. The main soil type of agricultural areas is a sandy loam derived from glacio-fluvial sands. Along the coast, raw, coarse textured sandy soils are derived from beach deposits, including sand dunes and dune slacks. In the area of the Sizewell Marshes SSSI soils consist of deep humified peats inter-collated with stiff clay layers.

Just under two thirds of the study area is agricultural land. Approximately 98% of that agricultural land is classified as ALC Grade 3b which is moderately good agricultural land. The other 2% is classified as ALC Grade 4 which is poor quality agricultural land. None of the agricultural land within the study area is 'best and most versatile land'.

1 Introduction

1.1 Introduction

EDF Energy is undertaking studies into the feasibility of constructing a new nuclear power station at Sizewell in Suffolk. This report provides the results of an investigation into the Agricultural Land Classification (ALC) of land to the west, north and south of the existing Sizewell power station on the coast east of the town of Leiston.

No previous ALC field surveys of this land have taken place.

1.2 Purpose and Scope

The purpose of this ALC assessment will be to inform the Environmental Impact Assessment (EIA) of soils and land use that will be part of the Environmental Statement to accompany the Planning Application for the proposed new power station.

The scope of ALC work at Sizewell includes the following tasks and activities:

- analysis of climate data for the study area;
- field survey of topography and site setting;
- field survey of soil types, depths and their stoniness;
- calculation of soil wetness classes, crop-adjusted available water capacity and crop-adjusted soil moisture balance;
- identification of the main soil and site (topography, gradient, aspect) limitations to agricultural productivity;
- allocation of ALC grades; and
- production of a map of the study area illustrating the distribution of ALC grades.

1.3 Study Area

The ALC study area is approximately 311 hectares (ha) in size and includes three sub-sections, as follows:

- the proposed construction area for the Sizewell C power station, comprising North, Central and South Zones (as defined in Appendix G);
- the proposed access road and associated construction area and car park to the north and west of the development site, primarily in Goose Hill and Kenton Hills Forest, with some areas of agricultural fields to the north of these forested areas; and

- areas of agricultural land proposed for heathland habitat creation.

The ALC study area is illustrated in Figure 1.

Areas (in hectares) of different land uses are provided in Table 2.

1.4 Report Layout

This report contains the following sections: Section 2 describes the methodology used for both soil and ALC field survey. Section 3 describes the soil types present in their study area and their soil profile characteristics. Section 4 provides an assessment of ALC, indicating what the main limitations to agricultural productivity are and quantifies the area of each ALC grade found within the study area for this report.

2 Methodology

2.1 Introduction

The soil and ALC survey was carried out in early November 2010. The survey was carried out using a hand Dutch auger, a hand screw auger and a spade. Some 143 observations were made across the entire study area, giving a survey intensity of approximately 0.5 observations per hectare over all land uses. This is believed to be an acceptable coverage given (a) the uniformity of arable fields and (b) the fact that over one third of the study area is not agricultural land. The fields and areas surveyed and the locations of auger observations are illustrated in Figure 1.

2.2 Field Survey Methodology

2.2.1 Health and Safety

A Health and Safety Risk Assessment was prepared to ensure that all potential site hazards were identified and mitigated. Specific procedures were developed to address two issues, as follows:

Potential *in situ* radiation hazard which could affect the surveyor when handling soils and hand texturing without gloves; and

Presence of unexploded ordnance (UXO) resulting from the post-Second World War use of part of the study area as a shooting range. Precautions adopted to mitigate these risks are outlined in the following two sections.

2.2.2 *In situ* Radiation Monitoring

At each location inside the Sizewell C development boundary, where soil samples were handled, the surface turf and subsequent soil samples were checked for any existing radionuclide contamination using an Electre DP6 (α /β particles) and a mini Instruments 1000R dose rate meter.

The action thresholds set for radioactivity were:

- Alpha particles 8 counts/s
- Beta particles 40 counts/s

All radiation doses monitoring during the ALC fieldwork were found to be well below these thresholds.

2.2.3 Clearance of UXO

To ensure that no UXO were encountered during the digging of soil pits or augering, all work within the Goose Hill and Kenton Hills parts of the survey area, as well as those locations within the Sizewell Marshes Site of Special Scientific Interest (SSSI) in the north west corner of the construction footprint (auger location numbers: 72-85, 150-159, and 115-117 respectively) were

preceded by a UXO sweep undertaken by BAE Systems Ltd. In these locations, augering proceeded only once the area was pronounced clear of UXO and safe for soil surveying. Those locations where UXO was detected, and the selected auger sampling location was moved, are indicated in Appendix A.

2.2.4 Field Survey Methodology

At each observation (augering) point the following site characteristics were recorded:

- vegetation type/crop/forestry description and percentage (%) surface cover;
- gradient;
- aspect;
- any indication of surface ponding/wetness; and
- any indication of soil erosion.

At each observation (augering) point the following soil characteristics were assessed for each soil horizon (according to Hodgson, 1976 (Ref 1)) up to a maximum of 110cm or any impenetrable layer:

- soil texture;
- stoniness;
- colour (including local mottle colours);
- consistency;
- structural condition; and
- depth.

Soil Wetness Class (WC) was inferred *in situ* from the matrix colour, and presence or absence of, and depth to, greyish and ochreous gley mottling and/or poorly permeable subsoil layers at least 15cm thick.

No soil samples were collected and no laboratory analysis carried out. All soil textures were derived from hand texturing in the field after radiation testing to confirm that they could be safely handled.

2.2.5 ALC Methodology

To establish the ALC grade, results from the soil survey were combined with data on the topography and climate of the area to provide an assessment of the land classification according to the methodology set out in MAFF (1988) (Ref 2).

ALC grade is determined by a combination of soil profile conditions, drainage status and climatic factors, including average annual rainfall and accumulated

temperature and topography (land gradient). The ALC system classifies land into 5 main categories (Grade 1 to 5) and two subdivisions within Grade 3, i.e. Classes a, and b. Grade 1 is the highest quality land with no or very limited restriction to agricultural use. Grade 5 is of least agricultural value, usually only of limited grazing use. Under Planning Policy Statement 7: Sustainable Development in Rural Area (Ref 3), Grades 1, 2 and 3a are defined as the 'best and most versatile' land (BMVL) and are a national resource to be protected. Descriptions of these five ALC classes are provided in Appendix B.

Soil droughtiness was calculated from moisture balance equations using crop-adjusted available profile water (AP) and calculated moisture deficit (MD) for the standard crops: wheat and potatoes. AP is estimated from soil texture, stoniness, soil structure condition and depth, and then compared to a calculated crop-adjusted MD taken from tables prepared by The Meteorological Office (1989) (Ref 4). MD is a function of potential evapotranspiration and rainfall. The ALC grading of land can be affected if the AP is insufficient to balance the MD. When a profile is found with significant stoniness, sufficient to prevent penetration of a hand auger, then it is assumed, for the purposes of calculating droughtiness, that similar levels of stoniness continues to the full 1.1m depth considered.

ALC grades and a map of the distribution of these grades within the Sizewell study area are provided for areas of land that are currently in agricultural use. For areas of land that are not currently in agricultural use, such as areas of forestry, sand dunes and the area of land to the north of Sizewell B power station, a brief description is provided of soil and other site conditions which would limit agricultural cultivation and productivity should the land be considered for agricultural use. As is the convention for non-agricultural land uses, these areas are not mapped on the map of ALC grades at Sizewell (Figure 3).

Published, broad scale mapping, of agricultural land quality (ALC status) at a scale of 1:250,000, (on the interactive MAGIC map: www.magic.defra.gov.org) (Ref 5) indicates that over half of the agricultural land within the study area is of Grade 4 or 5 and under a half is Grade 3 but this is not subdivided into Grades 3a and 3b. This grade split is the divide between what central government policy defines as best and most versatile (Grades 1, 2 and 3a) and land of only moderate quality. Hence an important purpose of the current study is to define which areas may be graded as BMVL.

3 Description of the Study Area

The study area consists of a number of parcels of land which will either be used for the construction of the Sizewell C development or will be used for heathland habitat creation. Photographic Plates are provided as Appendix F.

Within the development construction boundary, the proposed construction areas and car parking area for the development there are six different kinds of existing land uses. These are:

- mature coniferous and mixed plantation forestry as part of Goose Hill and Kenton Hills Forest;
- young mixed plantation forestry within the Sizewell power station estate;
- wet meadow habitat and grassland bund within the Sizewell power station estate;
- Sizewell Marshes SSSI;
- sand dune and dune slack to the east and north of Sizewell B power station; and
- arable agricultural land to the west of Kenton Hills Forest, south of Upper Abbey Farm.

Outside the Sizewell C development boundary and outside the proposed construction and car parking areas there are several compartments of arable agricultural land, detailed as follows:

- land around Lower Abbey Farm;
- land around Upper Abbey Farm;
- land between Leiston and the Sizewell power station complex, south west of Broom Covert; and
- land south of the Sizewell power station complex, named ‘Pillbox’ field.

These areas are illustrated in Figures 1 and 3.

4 Soil Parent Materials and Soil Types

4.1 Soil Parent Materials

Two main types of soil parent materials are present along the stretch of Suffolk coastline around Sizewell. Beach deposits, including sand dunes and marine shingle, are present along the narrow eastern coastal strip approximately 100-200m wide. Inland, mineral soils are derived from glacio-fluvial sands, either on relatively low river terraces or on gently sloping hill tops and ridges.

To the north of Sizewell, and infilling the low-lying river valley immediately west of Sizewell, are deep peat and clay deposits developed as a result of marine incursions during Holocene times. To the north of Sizewell these deposits form the Minsmere wetlands. Immediately west of the Sizewell B power station are the deep peat deposits of the Sizewell Marshes.

4.2 Soil Types

The main types of soils developed on coastal beach deposits are those belonging to the Sandwich association. These are described by the SSEW (1984) (Ref 6) as being both calcareous and on-calcareous sands. East of Sizewell B power station these soils are deep, developed on a series of sand dunes and slacks, with calcareous shelly lenses. In these areas marram grass dominates and soils are easily eroded. These 'raw' soils, with little or no organic matter or clay, are not suitable for agriculture.

The main types of soils around Sizewell developed on glacio-fluvial sands are those belonging to the Newchurch 4 association. These are described by the SSEW (1984) as being deep, well drained brown sandy soils which are often slightly acidic. Soils around Sizewell are deep loamy sands, frequently with some stony layers at depth. Subsoils are loose and sandy with little cohesion. These permeable sandy soils are generally Wetness Class (EC) I[1] and described as droughty. These soils are naturally acidic and liming is required for a range of crops.

Soils west and north of Sizewell developed on deep peat and clay deposits are those belonging to the Mendham association. These are described by the SSEW (1984) as being deep peaty and clayey soils which, on oxidation of the sulphates they contain, can become very acidic. These soils are very slowly permeable and require drainage for any kind of agricultural use.

The distribution of these soils types in the vicinity of Sizewell and Leiston is illustrated indicatively (from the SSEW map (Ref 6) in Figure 2.

Example soil profile descriptions for these three soil types are provided in Appendix D.

[1] A description of Wetness Classes (from MAFF 1988 (Ref 1) is provided in Appendix C.

5 Assessment of ALC

5.1 Introduction

The study area is approximately 311ha in size and consists of a number of different compartments and land uses. Approximately 197ha of the area is in agricultural use, amounting to 63% of the study area. Forestry accounts for a further 59ha or 19% of the study area. Areas of other non-agricultural land uses are provided in Table 2.

ALC grades of areas of land currently used for agriculture within the study area are illustrated in Figure 3. Areas of land which were surveyed, but which are not currently in agricultural use, are also illustrated in Figure 3 but are not assigned an ALC grade. The indicative ALC grade for these non-agricultural areas is described briefly in the text.

5.2 Local Climatic Factors

Table 1 presents the local climatic factors, taken from the Meteorological Office (1989) (Ref 4), that are used in ALC moisture balance calculations.

Table 1: Local climatic factors

Average annual rainfall (AAR)	579mm
Accumulated temperature > 0°C (AT0)	1437 days
Field Capacity Day regime (FCD)	103 days
Average moisture deficit wheat (MDw)	125mm
Average moisture deficit potatoes (MDp)	123mm

5.3 ALC and Main Limitations on the Agricultural Land

The principal constraint to agriculture in the fields north and west of Sizewell is droughtiness, caused by the sandy and very freely draining nature of Newchurch 4 soils (example are provided in Plates 1, 2 and 5). Although these soils are often deep and only slightly stony, their sandy texture reduces their moisture holding capacity and prevents their stored soil moisture from being adequately buffered against the effects of summer drought. The severity of droughtiness in these sandy soils places the majority of agricultural land in ALC Grade 3b, which is classed as moderately good agricultural land, but is not BMVL.

Soil droughtiness was investigated by the calculation of moisture balance equations using the data provided in Table 1, as described in Section 2.2. Example calculations for different parts of the study area are provided in Appendix E.

The area described as ‘Greater Gabbard’, which is the field in ‘Zone South’ of the Sizewell study area (see Appendix G), also has loamy sand topsoils but also has very loose and more coarse textured, sandy subsoils, giving them an

ALC Grade of no better than Grade 4, which is classed as poor quality agricultural land. Again, the main limitation to agricultural use is droughtiness.

A summary of the areas of different ALC grades within the study area is provided in Table 2 below.

Table 2: Summary of Areas of ALC Grades and Non-agricultural Land

Grade	**Description**	**Area (ha)**	**Area (% of agricultural land)**
Agricultural land and ALC Grades			
Sub-grade 3b	Moderate quality	304.34	98
Grade 4	Poor quality	7.1	2.2
Total agricultural land		197.44	100
Non-agricultural land			**Area (% of study area)**
	Forestry	59.2	19
	SSSI	6.4	2
	Sand dunes and slacks	11.5	3.7
	Sizewell B (Central Zone)	36.9	11.9
Total area		311.44 hectares	

Soil droughtiness has the potential to restrict the range of arable cropping and to restrict crop yields if summer drought is not alleviated by irrigation. For some crops, as observed at Sizewell for parsnips, moisture loss from surface soils can be somewhat controlled by the use of netting mulches. Net mulches can help to reduce surface soil temperatures and to lower evaporation.

In summary, approximately 98% of the agricultural land within the study area is classed as ALC Grade 3b, with the further 2% classed as Grade 4. There are no areas of land within the study area that are classed as BMVL.

5.4 Non-Agricultural Land

Just over one third of the land within the study area is non-agricultural. Soils in these areas were inspected and the results of the soil survey are provided in Appendix A.

5.4.1 Forestry land

Forestry land makes up approximately 59ha or 19% of the land within the study area.

Soils in Goose Hill and Kenton Hills forests are relatively deep, brown sandy loam soils with a very shallow leaf litter and organic surface horizon and are classified as Newchurch 4 soil association (see Plates 3 and 4). They generally have a very thin organic horizon, consisting of either sparse conifer or bracken litter with a very shallow (1-2cm) humic organic horizon beneath.

Forestry areas are not normally assessed for their ALC grade. If these areas were to be felled and the land converted to agriculture then, as for the surrounding agricultural fields, the main limitation to agricultural use would be droughtiness, due to their sandy loam texture.

5.4.2 SSSI land

Land within the Sizewell Marshes SSSI makes up approximately 6.4ha or 2% of the land within the study area.

Soils of the SSSI are deep peat and clay soils of the Mendham association. These soils are not suitable for agriculture without drainage (see Plate 7). Drainage leads to oxidation of the peat and can often lead to extreme acidification.

If land in this part of the SSSI was converted to agriculture then the main limitation to cultivation and agricultural use would be year-round wetness and waterlogging, resulting in the land being classed as being of poor quality for agriculture.

5.4.3 Land north of Sizewell B

Land immediately north of Sizewell B power station consists of a series of bunds and made ground with lower lying meadow and young mixed forest plantation. This area makes up approximately 37ha or 12% of the land within the study area.

Soils in this area are a mixture of made ground (particularly the bunds and raised platform immediately north of the power station) with coarse textured, sandy soils in the lower lying meadows. In places these soils are not suitable for agriculture without removal of stone, rock and in some places concrete, brick, etc.

If land in this part of the study area was converted to agriculture then the main limitation to cultivation and agricultural use would be droughtiness caused by (a) coarse sandy texture, (b) stoniness, and (c) shallow depths in places. A further limitation to agricultural cultivation would be the steep gradients (15-20^{o}) on edges of platform and bunds. These limitations would result in the land being classes as being of poor to very poor quality for agriculture.

5.4.4 Sand Dunes and Slack

Land to the east of Sizewell B power station, comprising the eastern coastal strip of the 'Central Zone' of the Sizewell C new build development, covers approximately 11.5ha or 4% of the land within the study area.

Soils of the sand dune and slack areas are deep, coarse textured sands with shelly and stony layers in places (Plate 6). These are soils of the Sandwich

association. These soils mainly support marram grass and are loose and easily eroded, making them unsuitable for agriculture.

If sand dunes and slacks were to be converted to agriculture then the main limitation to cultivation and agricultural use would be droughtiness resulting in the land being classes as being of very poor quality for agriculture.

6 References

1) Hodgson, J.M. Soil Survey Field Handbook. Describing and Sampling Soil Profiles. Soil Survey Technical Monograph No 5, Harpenden, 1976.

2) MAFF (Ministry of Agriculture, Fisheries and Food). Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land. 1988.

3) Planning Policy Statement 7: Sustainable Development in Rural Areas. Available at: http://www.communities.gov.uk/documents/planningandbuilding/pdf/147402.pdf

4) Meteorological Office. Climatological Data for Agricultural Land Classification. Gridpoint datasets of climatic variables at 5km intervals for England and Wales. 1989.

5) MAGIC (Multi-Agency Geographic Information for the Countryside) website. Available at: www.magic.defra.gov.uk Concept Of Operation (CONOP)

6) Soil Survey of England and Wales. Soils and Their Use in Easter England. SSEW Bulletin No 15, 1984 and associated Map Sheet No 4.

FIGURES

FOR DISCUSSION

LOWER ABBEY FARM

UPPER ABBEY FARM

KENTON HILLS

LEISTON CP

GOOSE HILL

SIZEWELL MARSHES SSSI

PILLBOX FIELD

Minsmere Level

Minsmere New Cut

Dunwich Forest

Sizewell Belts

Leiston Common

Broom Covert

Ash Wood

Power Station

Sizewell

Eastbridge

Dam Bridge

Cowmarsh Hill

Twopenny Arch

Dovehill Plantation

Sandypyttle Plantation

Lower Abbey Farm

Eastbridge Farm

Red House Farm

England Covert

Burial Ground

Drift Farm

Plantation Cottages

Black Walks

The Alders

Potter's Farm

Broom Covert

Birchwood Farm

Greenhouse Plantation

The Round House

Ash Wood Cottages

Walk Barn

Goose Hill

Hilltop Covert

Nursery Covert

Turf Pits

Abbey Cottage

Lodge

Old Abbey Farm

Leiston Old Abbey

Fiscal Policy

Laboratory

Kenton Hills

Grimseys

Leiston Carr

Reckham Pits Wood

Keepers Cottage

Common Cottages

Reckham Lodge

The Studio

Round Covert

Rookyard Wood

Coronation Wood

Hill Wood

Off-shore Tower

Sewage Works

Brick Kiln Farm

Caravan Park

PW

Allot Gdns

F Sta

Ind Est

Sizewell Crossing

Crown Lodge

Crown Farm

Halfway Cottages

Home Farm

Cliff House

Caravan Site

Sizewell Common

Sizewell Hall

Pebble Cottages

White Cottages

Ivy Cottages

Coastguard Cottages

CG Lookout

Car Parks

Nursery Cottages

Sandy Lane (Track)

Cycle Track

Sports Ground

Recn Gd

School

Leiston Community High School

Sports Centre

Playing Field

Crown Land Cottage

Sandy Lane (Track)

Grimsey's Lane (Track)

Stonewall Belt

Chapel (remains of)

The Sluice

Sluices

Mean High Water

Mean Low Water

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PRELIMINARY

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Study Area Boundary

71 Auger Hole Location

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Drawing Number		
FIGURE 1		

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AMEC Earth & Environmental
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Dover Place, Ashford, Kent TN23 1HU
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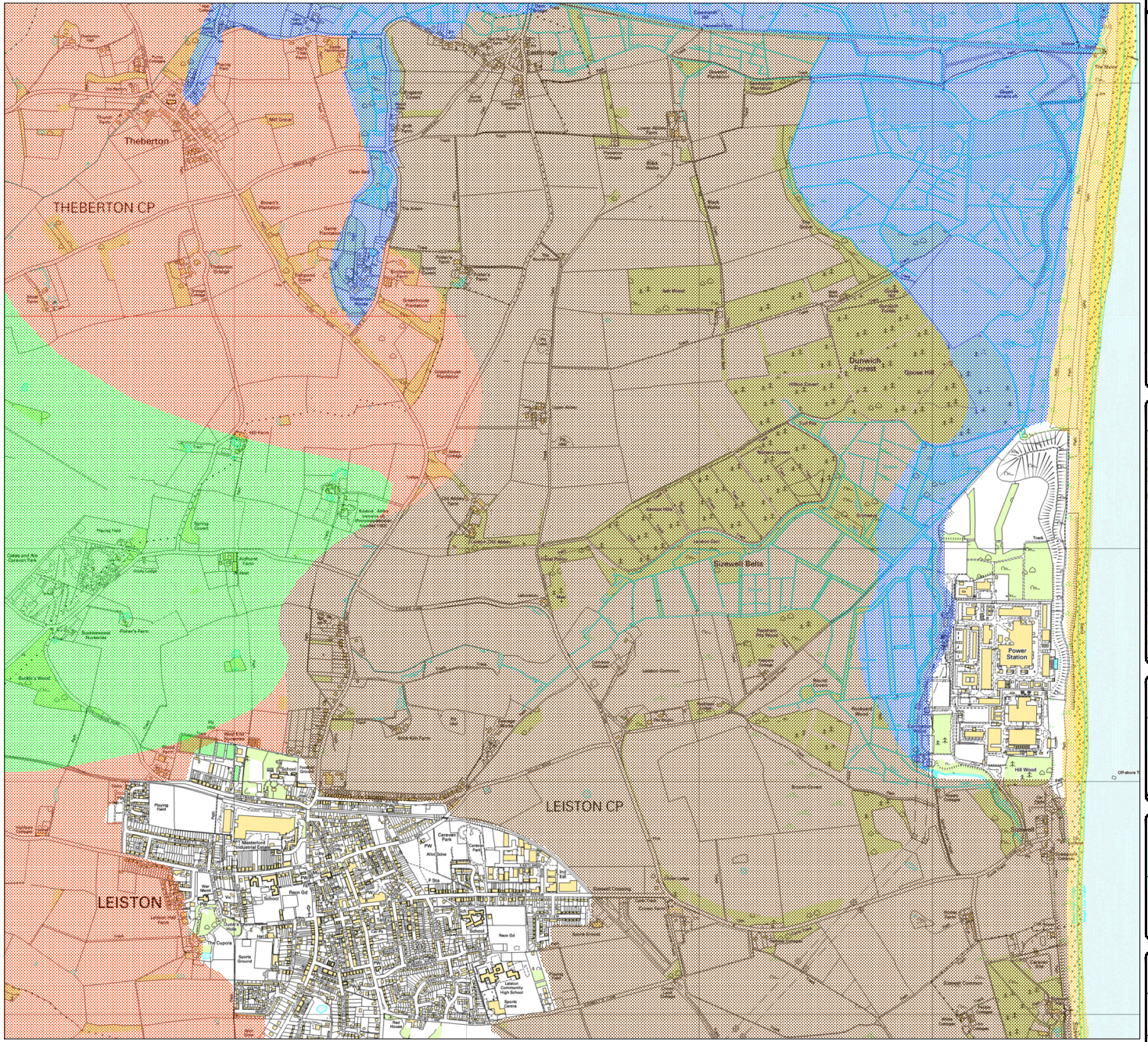
www.amec.com

Project: SIZEWELL

Title: AUGER LOCATION PLAN

Sizewell Auger Locations (002).dwg – Layout – 27 January 2011 14:37:17 – Bridgland, Wayne



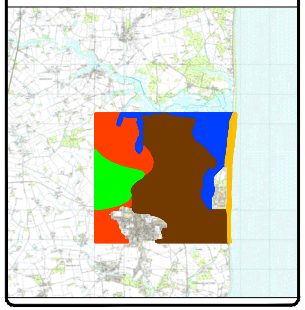
FOR DISCUSSION

KEY

- 361 Sandwich Soil Association
- 551g Newport 4 Soil Association
- 551f Newport 3 Soil Association
- 1025 Mendham Soil Association
- 712g Ragdale Soil Association

Information taken from the Soil Survey of England and Wales (1984) map at a scale of 1:250,000

Overview



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Client: EDF

amec
AMEC Earth & Environmental UK Ltd
Dover Place, Ashford, Kent, UK

Project: SIZEWELL

Title: INDICATIVE SOIL TYPES IN THE VICINITY OF SIZEWELL AND LEISTON

Drawn	Checked	Approved
WB	SR	
Date		Sheet size
JANUARY 2011		A4
Drawing Number		Scale
FIGURE 2		1:25,000

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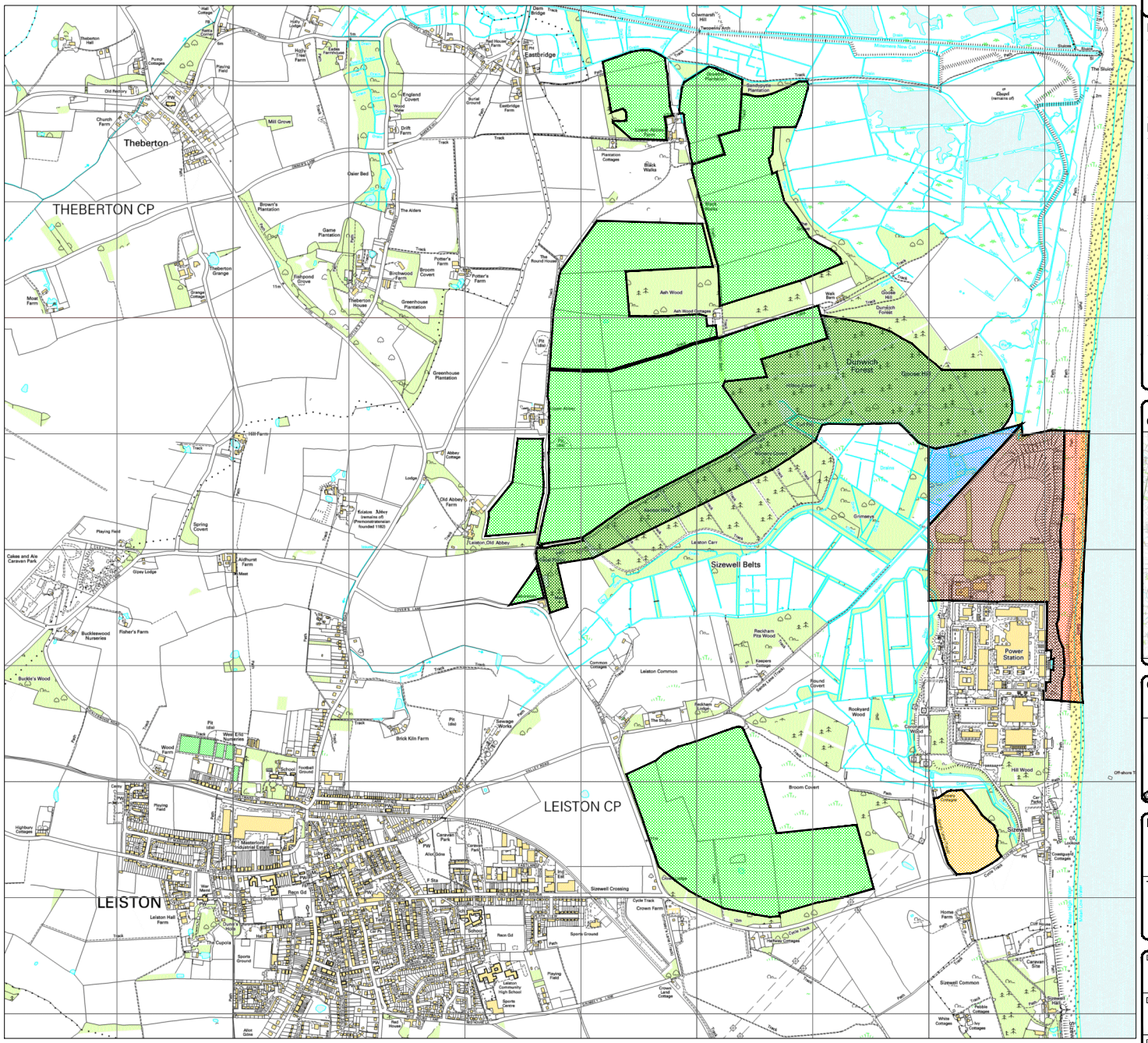


FOR DISCUSSION

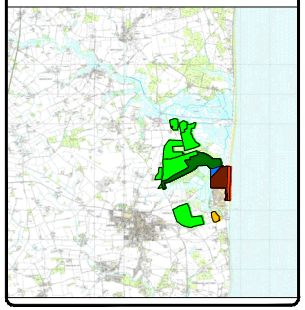
KEY

- Grade 3b
- Grade 4

NON-AGRICULTURAL LAND

- Sizewell Marshes SSSI
- Coastal Sand Dune and Dune Slack
- Commercial Forestry within the Study Area
- Made Ground (Sizewell B)
- Woodland/forestry outside the study area

Overview



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Client: EDF

amec

AMEC Earth & Environmental UK Ltd
Dover Place, Ashford, Kent, UK

Project: SIZEWELL

Title: AGRICULTURAL LAND CLASSIFICATION GRADES AND OTHER LAND USES

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Date: JANUARY 2011		Sheet size: A4
Drawing Number: FIGURE 3		Scale: 1:25,000

Figure_3_-_Sizewell_ALC_areas_(003).dwg - A4 - 01 February 2011 17:42:55 - Bridgland, Wayne

Appendix A Soil Descriptions at Auger Sampling Locations

SIZEWELL AGRICULTURAL LAND CLASSIFICATION RECORD SHEET

Location: LOWER ABBEY	Date: 1.11.10	Surveyor(s): SR, SH, RE	Weather: Dull, overcast, Dry	Page No: 1

Criteria: 1 depth, 2 boundary, 3 colour + mottles, 4 texture, 5 stoniness, 6 moisture status, 7 structure, 8 consistency (erosion)

Auger No	POWRA	GPS (8)	Slope (deg)	Aspect (deg)	Land Use/ surface vegetation	Horizon 1	Horizon 2	Horizon 3	Comments (inc UXO/rad)
1	√	TM 646032 265641	1.5	110	Wheat stubble	1 0- 38 / 46cm (Ap horizon) 2 diffuse + irregular 3 2.5y 5/4 (yellowish grey) 4 loamy sand 5 <2% 6 Damp 7 Med to fine - granular structure 8 loose, grainy	1 46 - >70 2 diffuse, irregular 3 2.5y 5/6 (yellowish grey) 4 Loamy sand 5 2 - 5% 6 Damp 7 Medium angular blocky structure 8 loose, grainy	1 2 3 4 5 6 7 8	UXO rad (α) (p x 2) rad (β) rad (γ) ~ 80% bare soil (stubble) potential for wind erosion, shallow gradient, no visible erosion
2	√	TM 646175 265746	3	109	Wheat stubble	1 0- 36 / 38cm (Ap horizon) 2 diffuse + irregular 3 2.5y 5/4 (yellowish grey) 4 loamy sand 5 <2% 6 Damp 7 Med to fine - granular structure 8 loose, grainy	1 38 - 40cm 2 diffuse + irregular 3 2.5y 5/6 (yellowish grey) 4 Loamy sand 5 2 - 4% 6 Damp 7 Medium angular blocky structure 8 loose, grainy	1 2 3 4 5 6 7 8	UXO rad (α) (p x 1) rad (β) rad (γ) ~80% bare soil/stubble, ~3% slope - potential for surface water erosion (especially downslope/wheel tracks)
3	√	TM 646271 265650	2.4	81	Wheat stubble	1 0- 38 / 40cm 2 diffuse 3 2.5y 5/4 4 loamy sand 5 <3% 6 Damp 7 Med to fine - granular structure 8 loose, grainy	1 40 - 78cm 2 diffuse 3 2.5y 5/6 4 Loamy sand 5 5% stones 6 damp 7 Poor medium angular blocky structure 8 loose, grainy	1 >78cm 2 2.5y 6/6 3 sand 4 damp 5 >5% 6 damp 7 No clear structure 8 compacted, grainy	UXO rad (α) rad (β) rad (γ) 80% bare earth, ~2% slope - potential for surface soil erosion
4	√	TM 646304 265530	4.2	74	bare soil, v young potato crop?	1 0 - 35 / 38cm 2 diffuse 3 2.5y 5/4 4 loamy sand 5 <3% 6 Damp 7 Poor med to fine granular 8 loose, grainy	1 38 - 50cm 2 diffuse 3 2.5y 5/6 4 Loamy sand 5 5% stones 6 damp 7 Poor med - sub-angular blocky 8 loose, grainy	1 >50cm 2 diffuse 3 2.5y 6/7 4 sand 5 5% 6 damp 7 No clear structure 8 compacted, grainy	UXO rad (α) rad (β) rad (γ) erosion potential due to soil exposed surface
5	√	TM 646346 265409	3.1	78	bare soil, v young potato crop?	1 0-34cm 2 diffuse, regular 3 2.5y 5/4 4 loamy sand 5 ~ 2% stone at 34cm 6 Damp 7 Poor med to fine granular 8 loose, grainy	1 34 - 50cm / 60cm 2 diffuse, irregular 3 2.5y 5/6 4 loamy sand 5 stoneless 6 Damp 7 Poor med - sub-angular blocky 8 loose, grainy	1 >90 2 diffuse 3 2.5y 6/6 4 sand 5 stoneless 6 Damp 7 No clear structure 8 cohesive, grainy	UXO rad (α) rad (β) rad (γ) bare soil erosion risk esp. tracks
6	√	TM 646406 265294	2.5	83	Fine mesh mulch over parsnips	1 0-35cm 2 diffuse/irregular 3 2.5y 5/4 4 loamy sand 5 stoneless 6 moist/damp 7 Poor med to fine granular 8 cohesive, balls but falls apart	1 35 - 60 / 75cm 2 3 2.5y 4/6 4 Loamy sand 5 2% stone 6 moist/damp 7 Poor med - sub-angular blocky 8 cohesive	1 >75cm 2 3 2.5y 5/6 4 sand 5 2% stone 6 moist/damp 7 No clear structure 8 cohesive, grainy	UXO rad (α) rad (β) rad (γ) mulched rows 12m wide.
7	√	TM 646470 265219	1.2 (up to 5.6 at crest)	92	fine mesh mulch over parsnips	1 0 - 45 / 50cm 2 diffuse/irregular 3 2.5yr5/4 4 loamy sand 5 35 - 40cm 2 - 5% stone 6 moist/damp 7 Poor med to fine granular 8 cohesive	1 50 - 60 / 65cm 2 diffuse/irregular 3 2.5y 4/6 4 Loamy sand 5 stoneless 6 moist/damp 7 Poor med - sub-angular blocky 8 cohesive	1 >65cm 2 diffuse/irregular 3 2.5y 5/6 4 sand 5 stoneless 6 moist/damp 7 No clear structure 8 loose sand	UXO rad (α) rad (β) rad (γ) Auger taken within hollow. Field - slope varies.
8	√	TM 646241 265162	2.2	88	fine mesh mulch over parsnips	1 0 - 36cm 2 diffuse/irregular 3 2.5y 5/4 4 loamy sand 5 <2% stones 6 moist/damp 7 Poor med to fine granular 8 cohesive	1 36 - 55cm 2 diffuse/irregular 3 2.5y 4/6 4 loamy sand 5 stoneless 6 moist/damp 7 Poor med - sub-angular blocky 8 cohesive	1 55 - 78cm 2 3 2.5y 5/6 4 sand 5 stoneless 6 moist/damp 7 No clear structure 8 loose sand	UXO rad (α) rad (β) rad (γ)

9	√	TM 646151 265189	<1	77	fine mesh mulch over parsnips	1 0 - 32 / 35cm 2 diffuse/irregular 3 2.5y 5/4 4 loamy sand 5 stoneless 6 damp/moist 7 Poor med to fine granular 8 cohesive	1 35 - 50 / 55cm 2 diffuse/irregular 3 2.5y 4/6 4 Loamy sand 5 stoneless 6 damp/moist 7 Poor med - sub-angular blocky 8 cohesive	1 55 - >80 2 3 2.5y 5/6 4 sand 5 stoneless 6 damp/moist 7 No clear structure 8 loose sand	UXO rad (α) rad (β) rad (γ) Ploughed field - top 20 - 25cm is generally loose + light soil.
10	√	TM 646129 265302	1.9	74	Bare soil potato crop	1 0 - 38cm 2 diffuse/irregular 3 2.5y 4/2 (greyish olive) 4 loamy sand 5 stoneless 6 damp/moist 7 Med to fine granular structure 8 cohesive, balls but falls apart	1 38 - 60cm 2 diffuse/irregular 3 2.5y 5/6 4 Loamy sand 5 stoneless 6 damp/moist 7 Poor med - sub-angular blocky 8 cohesive	1 >60cm 2 diffuse/irregular 3 2.5y 6/6 4 sand 5 stoneless 6 damp/moist 7 No clear structure 8 cohesive, grainy	UXO rad (α) rad (β) rad (γ) Bare soil erosion risk - soil becoming denser with depth.
11	√	TM 646093 265419	1.9	74	Bare soil potato crop	1 0 - 33 / 36cm 2 diffuse/irregular 3 2.5y 5/4 4 loamy sand 5 stones 2 - 5% 6 damp/moist 7 Poor med to fine granular structure 8 cohesive, balls but falls apart	1 36 - 60 / 65cm 2 diffuse/irregular 3 2.5y 5/4 4 loamy sand 5 stoneless 6 damp/moist 7 Poor med - sub-angular blocky 8 cohesive	1 65 - >80cm 2 diffuse/irregular 3 2.5y 5/6 4 sand 5 stoneless 6 damp/moist 7 No clear structure 8 cohesive, grainy	UXO rad (α) rad (β) rad (γ)
12	√	TM 646059 265575	1.3	92	80% bare soil + cereal stubble	1 0 - 45 / 52cm 2 diffuse/irregular 3 2.5y 5/4 4 loamy sand 5 stones 2 - 5% 6 damp 7 Med to fine granular structure 8 cohesive	1 52-68cm 2 diffuse/irregular 3 2.5y 5/6 4 Loamy sand 5 stoneless 6 damp 7 Med - sub-angular blocky 8 cohesive	1 68cm - >80cm 2 diffuse/irregular 3 2.5y 7/4 (greyish yellow) 4 sand 5 stones 2% 6 soft and wet 7 No clear structure 8 cohesive, grainy	UXO rad (α) rad (β) rad (γ)
13	√	TM 645995 265288	0.6	105	Bare soil 100% - newly ploughed, previous crop - onions	1 35cm - 40cm 2 diffuse/irregular 3 2.5y 5/3 4 loamy sand 5 stones immediately below ploughed layer 6 damp 7 Poor med to fine granular structure 8 cohesive	1 40cm - >80cm 2 diffuse/irregular 3 2.5y 6/4 4 Loamy sand 5 stoneless 6 damp 7 Med - sub-angular blocky 8 cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) potential for wind erosion - bare soil. Shallow gradient.
14	√	TM 645969 265359	0.6	101	Bare soil 100% - newly ploughed, previous crop - onions	1 0 - 30cm * 2 diffuse/irregular 3 2.5y 5/3 4 loamy sand 5 stony layer at base of horizon (>20%) 6 damp 7 Poor med to fine granular structure 8 cohesive	1 30 - 78cm 2 diffuse/irregular 3 2.5y 6/3 + 2.5y 4/6 4 loamy sand 5 <3% 6 damp 7 Med - sub-angular blocky 8 cohesive	1 >80cm 2 diffuse 3 2.5y 3/3 (dark olive brown) 4 loamy sand 5 <3% 6 damp 7 No structure 8 cohesive	UXO rad (α) rad (β) rad (γ)
15	√	TM 645821 265366	<0.	102	Bare soil 100% - newly ploughed, previous crop - onions	1 0 - 33 / 35cm 2 diffuse, irregular 3 2.5y 5/3 4 loamy sand 5 stoneless 6 damp 7 Poor med to fine granular structure 8 cohesive	1 35 - 70cm 2 diffuse, irregular 3 2.5y 3/3 4 Loamy sand 5 shingle/stones + compacted 5 - 10% 6 moist 7 Med - sub-angular blocky 8 more compact	1 >70cm 2 diffuse 3 2.5y 3/3 4 loamy sand 5 stones 6 damp 7 No structure 8 cohesive, grainy	UXO rad (α) rad (β) rad (γ)
16	√	TM 645819 265305	1.1	110	Bare soil 100% - newly ploughed, previous crop - onions	1 0 - 35cm 2 diffuse but regular 3 2.5y 5/3 4 loamy sand 5 stoneless 6 damp 7 Poor med to fine granular structure 8 cohesive	1 35 - 100cm 2 diffuse but regular 3 2.5y 6/4 (ochre) 4 loamy sand 5 stony layer 3 - 5% 6 damp 7 Med - sub-angular blocky 8 cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)

17	√	TM 645628 265293	<1	300	100% bare soil - newly ploughed, previous crop - onions	1 0 - 28 / 33cm 2 diffuse, regular 3 2.5y 5/3 4 loamy sand 5 stoneless 6 damp 7 Poor med to fine granular structure with secondary med - sub-angular blocky structure 8 cohesive	1 33 - >59cm 2 diffuse, regular 3 2.5y 6/4 4 Loamy sand 5 stony layer (5 - 10% stones) 6 damp 7 Poor med - sub-angular blocky 8 cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) stony layer depth 42 - 46cm. Limited by stoniness at 55 - 58cm, not possible to go deeper.
18	√	TM 645575 265339	<1	300	100% bare soil - newly ploughed, previous crop - onions	1 0 - 30cm * 2 diffuse, regular 3 2.5Y 5/3 4 loamy sand 5 stoneless 6 damp/wet 7 Poor med to fine granular structure with secondary med - sub-angular blocky structure 8 cohesive	1 30 - 55 / >60cm 2 diffuse, regular 3 2.5y 6/4 (ochre) 4 Loamy sand 5 stony layer 35 - 45cm 6 damp 7 Poor med - sub-angular blocky 8 compacted	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) standing water in wheel ruts
19	√	TM 645505 265261	<1	300	100% bare soil - newly ploughed, previous crop - onions	1 0 - 38cm 2 diffuse, regular 3 2.5y 5/3 4 loamy sand 5 stones 20% 6 damp 7 Poor med to fine granular structure with secondary med - sub-angular blocky structure 8 cohesive	1 38cm - 100cm 2 diffuse, regular 3 2.5y 6/4 (ochre) 4 sandy loam 5 stones <5% in first 10cm of this layer 6 damp 7 Poor med - sub-angular blocky 8 compacted	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) clay component evident within soil at depth
20	√	TM 645456 265132	<1	no slope	stubble field <80% bare soil exposed - vehicle ruts	1 0 - 38cm 2 diffuse, irregular 3 2.5y 5/3 4 loamy sand 5 stony at base of horizon 6 damp 7 Poor med to fine granular structure 8 compacted soil	1 38 - 73cm 2 diffuse, regular 3 2.5y 6/4 (ochre) 4 Loamy sand 5 stony - 45cm. 10% stones 6 damp 7 Poor med - sub-angular blocky 8 compacted soil	1 >73cm 2 diffuse 3 2.5Y 6/4 4 sandy loam 5 greater clay content 6 damp 7 no structure 8 compacted	UXO rad (α) rad (β) rad (γ) limited by stones at 38 - 45cm depth. Clay component at deeper depths >75cm
21	√	TM 645562 265094	0	0	stubble field with <80% bare soil exposure - wheel ruts throughout	1 0 - 40cm 2 diffuse, irregular 3 2.5y 5/3 4 loamy sand 5 stones <2% 6 damp 7 Poor med to fine granular structure 8 compacted soil	1 40 - >80cm 2 diffuse, irregular 3 2.5y 6/4 (ochre) 4 Loamy sand 5 stones <2% 6 damp 7 Poor med - sub-angular blocky 8 compacted soil	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
22	√	TM 645446 265081	0	0	stubble field with <80% bare soil exposure - wheel ruts throughout	1 0 - 46cm 2 diffuse, irregular 3 2.5y 5/3 4 loamy sand 5 stones <2% 6 damp 7 Poor med to fine granular structure 8 compacted soil	1 46 - 72cm 2 diffuse, regular 3 2.5y 6/4 (ochre) 4 loamy sand 5 stones <5% 6 damp 7 Poor med - sub-angular blocky 8 compacted soil	1 >72cm 2 3 2.5y 6/3 4 More clay content and sandy loam 5 <5% 6 damp 7 no structure 8 compacted	UXO rad (α) rad (β) rad (γ)
23	√	TM 645427 264977	no slope	no aspect	100% bare soil, very recently ploughed	1 0 - 36cm 2 diffuse, regular 3 2.5y 5/3 4 loamy sand 5 no stones 6 damp 7 Poor med to fine granular structure 8 compacted soil	1 36 - 75cm 2 diffuse, regular 3 2.5y 6/4 (ochre) 4 loamy sand 5 36 - 45cm depth - stony and gravely layer (5-10%) 6 damp 7 Poor med - sub-angular blocky 8 compacted soil	1 >75cm 2 3 2.5y 6/3 4 distinct clay content. Despite this, texture is sandy loam 5 gravely - 5-10% 6 damp 7 no structure 8 compacted	UXO rad (α) rad (β) rad (γ) slope varied within field - dip/depression in centre of field

24	√	TM 645544 264954	no slope	no aspect	100% bare soil, very recently ploughed	1 0 - 43cm 2 diffuse, regular 3 2.5y 5/3 4 loamy sand 5 no stones 6 damp 7 Poor med to fine granular structure 8 loose	1 43 - 70cm 2 diffuse, regular 3 2.5y 6/4 (ochre) 4 sandy loam 5 <3% 6 damp 7 Poor med - sub-angular blocky 8 very stiff and compact	1 70 - >85cm 2 3 2.5y 6/4 4 sandy loam with chalky fragments up to gravel size - very clay feel, sticks to fingers. Texture is still a sandy loam. 5 no stones 6 damp 7 no structure 8 compacted	UXO rad (α) rad (β) rad (γ)
25	√	TM 645552 264845	<1	105	100% bare soil, very recently ploughed	1 0 - 45cm 2 diffuse, regular 3 2.5y 5/3 4 loamy sand 5 no stones 6 damp 7 Poor med to fine granular structure 8 loose	1 45 - >96cm 2 diffuse, regular 3 2.5y 6/4 4 Loamy sand 5 45 - 55 stony band (<5%) 6 damp 7 Poor med - sub-angular blocky 8 stiff and compact	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
26	√	TM 645685 264864	2 - 3	93	wheat stubble with vehicle ruts <80% bare soil exposed	1 0 - 30 2 diffuse, regular 3 2.5y 5/3 4 loamy sand 5 no stones 6 damp 7 Poor med to fine granular structure 8 Cohesive	1 30 - >80cm 2 diffuse, regular 3 2.5y 6/4 4 coarse sand 5 no stones 6 damp 7 Poor med - sub-angular blocky 8 stiff and compact	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
27	√	TM 645730 264942	3	145	wheat stubble with vehicle ruts <80% bare soil exposed	1 0 - 52cm 2 diffuse and irregular 3 2.5y 5/3 4 loamy sand 5 no stones 6 damp 7 Poor med to fine granular structure 8 Cohesive	1 52 - 86cm 2 diffuse 3 2.5y 6/4 4 course sand 5 no stones 6 damp 7 Poor med - sub-angular blocky 8 compacted	1 >86cm 2 3 2.5y 6/4 (ochre) 4 course sand 5 no stones 6 damp 7 no structure 8 compacted	UXO rad (α) rad (β) rad (γ)
28	√	TM 645946 264947		195	wheat stubble with vehicle ruts <80% bare soil exposed	1 0 - 45cm 2 diffuse and irregular 3 2.5y 5/3 4 loamy sand 5 40 - 45cm depth stony layer at base 6 damp 7 poor to no structure 8 Cohesive	1 45 - 80cm 2 diffuse 3 2.5y 6/4 4 gradual loamy sand - change to coarse sand 5 Stones at top of layer 45 - 50cm depth 6 damp 7 Poor med - sub-angular blocky 8 compacted	1 >80cm 2 3 2.5y 6/4 4 course sand 5 no stones 6 moist/damp 7 no structure 8 compacted	UXO rad (α) rad (β) rad (γ)
29	√	TM 646026 264840	<1	180	Net mulch over parsnips. With tracks at approx 5m intervals.	1 0 - 45cm 2 diffuse and irregular 3 2.5y 5/3 4 loamy sand 5 no stones 6 damp 7 poor to no structure 8 Cohesive	1 45 - 70cm 2 diffuse 3 2.5y 6/4 4 loamy sand 5 stony at 85 - 95cm <2% stones 6 damp 7 Poor med - sub-angular blocky 8 loose, grainy	1 >70cm 2 3 2.5y 6/4 4 loamy sand 5 no stones 6 moist/damp 7 no structure 8 loose	UXO rad (α) rad (β) rad (γ)
30	√	TM 646029 264760	2 - 3	30	Net mulch over parsnips. With tracks at approx 5m intervals.	1 0 - 34cm 2 diffuse 3 2.5y 5/3 4 loamy sand 5 no stones 6 damp 7 poor medium granular structure 8 Cohesive	1 34 - >74cm 2 diffuse 3 2.5y 6/4 4 Loamy sand 5 1 - 2% stones below stony layer 6 damp 7 Poor med - sub-angular blocky 8 loose, grainy	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) stony layer 35 - 40cm 5% stones
31	√	TM 645870 264745	<1	25	Net mulch over parsnips. With tracks at approx 5m intervals.	1 0 - 60cm 2 diffuse 3 2.5y 5/3 and slight band of diff colour 2.5y 3/3 at 40-45cm 4 loamy sand 5 no stones. Stony layer 40 - 45cm (5-10%) 6 damp 7 poor medium granular structure 8 Cohesive	1 60 - >90cm 2 3 2.5y 6/4 (ochre) 4 Loamy sand 5 no stones 6 moist to wet 7 Poor med - sub-angular blocky 8 cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) slight band of diff colour 2.5y 3/3

32	√	TM 645575 264692	2 - 3	30	stubble field. 50% bare earth	1 0 - 56cm 2 diffuse 3 2.5y 5/3 4 loamy sand 5 no stones 6 damp 7 poor medium granular structure 8 Cohesive	1 56 - 88cm 2 diffuse, regular 3 2.5y 6/4 (ochre) 4 Loamy sand 5 no stones 6 damp 7 Poor med - sub-angular blocky 8 loose	1 >88cm 2 diffuse, regular 3 2.5y 6/4 4 course sand with gravel 5 5% <10mm gravel 6 damp 7 no structure 8 moist	UXO rad (α) rad (β) rad (γ)
33	√	TM 645473 264604	0	0	Wheat stubble	1 0 - 58cm 2 diffuse, regular 3 2.5y 5/3 4 loamy sand 5 no stones 6 damp 7 poor medium granular structure 8 loose, not cohesive	1 58 - 82cm 2 diffuse, regular 3 2.5y 6/4 (ochre) 4 loamy sand 55 - 60cm stony (5%); 5 >60cm no stones 6 damp 7 Poor med - sub-angular blocky 8 loose, not cohesive	1 82 - >88cm 2 3 2.5y 6/4 4 sandy loam 5 no stones 6 damp 7 no structure 8 cohesive	UXO rad (α) rad (β) rad (γ)
34	√	TM 645536 264535	0	0	Wheat stubble	1 0 - 36cm 2 diffuse, regular 3 2.5y 5/3 4 loamy sand 5 stoneless 6 damp 7 poor medium granular structure 8 damp, sand, not cohesive	1 36 - 45cm * 2 diffuse, regular fragments of white chalk in matrix of 2.5y 5/3 3 >50cm 2.5y 6/4 4 loamy sand 5 no stones 6 damp 7 Poor med - sub-angular blocky 8 some cohesion	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) * 36cm white fragments of chalk. Fragments of white sand throughout 36 - 90cm.
35	√	TM 645695 264605	0	0	Wheat stubble	1 0 - 46cm 2 very diffuse, regular 3 2.5y 5/3 4 loamy sand 5 no stones 6 damp 7 poor medium granular structure 8 loose, not cohesive	1 46 - 91cm 2 diffuse 3 2.5y 6/4 loamy sand throughout, except top 5cm which is 4 sandy loam 5 no stones 6 dry to moist - less cohesion 7 Poor med - sub-angular blocky 8 less cohesion below 50cm	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
36	√	TM 645679 264539	base of slope (n-s) 12.5 (e-w) 9.5	hollow (N-S) 195 (e-w) 270	Wheat stubble	1 0 - 100cm 2 no clear horizons 3 2.5y 5/3 0-10cm sandy loam, >10cm 4 loamy sand 5 no stones 6 damp to wet 7 Poor med - sub-angular blocky 8 not cohesive below 10cm, cohesive in top 10cm	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) Water ponding in hollow. Evidence of surface erosion.
37	√	TM 645415 264368	hollow (w-e) 5 - 8 (e-w) 8 - 10	hollow (w-e) east 90 (E-W) west 270	Newly ploughed field	1 0 - 36cm 2 diffuse, irregular 3 2.5y 5/3 4 sandy loam 5 stoneless 6 damp 7 poor medium granular structure 8 stiff to very stiff	1 36 - 78cm 2 diffuse, irregular 3 2.5y 5/3 4 sandy loam 5 2 - 3% stones at 65cm 6 damp 7 Poor med - sub-angular blocky 8 very stiff	1 >78cm 2 3 2.5y 5/3 loamy sand at 92cm, below 4 courser and less stiff 5 no stones 6 damp 7 no structure loamy sand at 92cm, below 8 more coarse and less stiff	UXO rad (α) rad (β) rad (γ)
164	√	TM 646317, 265895	0	0	Crop of sugar beet, approx 80% ground cover. Good, even growth field wide with 25cm gaps between planting rows.	1 0 - 30cm 2 diffuse, irregular 3 2.5y 5/4 4 loamy sand 5 <5% stones 6 damp 7 poor medium granular structure 8 loose, gritty, slight cohesion	1 30-100cm 2 diffuse, irregular 3 2.5y 6/4 4 sandy loam 5 2 - 3% stones at 65cm 6 damp 7 Poor med - sub-angular blocky 8 loose, gritty, not cohesive, sandy	1 >100cm 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) A - Mid brown silty fine SAND with up to 5% sub-rounded to rounded fine to coarse gravel. B - Brownish orange silty fine to coarse SAND with 5% sub-rounded to rounded gravel.

163	√	TM 646074, 265921	1-5°	Northern ¼ of field N aspect, Western 1/3 of field W / NW aspect, eastern 2/3 of field E aspect.	Sugar beet (60% cover) and open soil (40%). Areas of poor crop growth in south and eastern areas of field	1 0 - 45cm 2 diffuse, irregular 3 2.5y 5/4 4 loamy sand 5 1% 6 damp poor medium granular 7 structure 8 loose, sandy, slight cohesion	1 45-60cm 2 diffuse, irregular 3 2.5y6/4 4 loamy sand 5 1% 6 damp Poor med - sub-angular 7 blocky loose, sandy, slight 8 cohesion	1 >60cm 2 3 2.5y6/3 4 loamy sand 5 1-3% 6 damp 7 8 loose, sandy, no cohesion	UXO rad (α) rad (β) rad (γ) A - Greyish brown silty fine to medium SAND with 1% fine to medium sub-rounded to rounded gravel. B1 - Orangish brown silty fine to medium SAND with 1% fine to medium sub-rounded to rounded gravel. B2 - Brownish orange fine to coarse SAND with 1-3% sub-rounded to rounded gravel.
162	√	TM 645745, 265957	3-6°	70°	80% sugar beet coverage 20% bare ground.	1 0 - 45cm 2 diffuse, irregular 3 2.5y 5/4 4 loamy sand 5 stoneless 6 moist poor medium granular 7 structure 8 loose, sandy, slight cohesion	1 45-60cm 2 diffuse, irregular 3 2.5y6/4 4 loamy sand 5 1-3% 6 damp Poor med - sub-angular 7 blocky loose, sandy, not 8 cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) A - Mid brown slightly silty fine to medium SAND. B - Orangish brown slightly silty fine to coarse SAND with 1-3% fine to coarse sub-rounded to rounded flint gravel.

SIZEWELL AGRICULTURAL LAND CLASSIFICATION RECORD SHEET

Location: UPPER ABBEY	Date: 2.11.10	Surveyor(s): SR, SH, RE	Weather: Overcast/drizzle	Page No: 1-5

Criteria: 1 depth, 2 boundary, 3 colour + mottles, 4 texture, 5 stoniness, 6 moisture status, 7 structure, 8 consistency (erosion)

Auger No	POWRA	GPS (8)	Slope (deg)	Aspect (deg)	Land Use/ surface vegetation	Horizon 1	Horizon 2	Horizon 3	Comments (inc UXO/rad)
38	√	TM 645810 264640	1.2	95	Wheat stubble - 70% bare soil, vehicle wheel ruts	1 0-40cm 2 Diffuse, regular 3 2.5y 5/3 mid brown 4 Loamy sand 5 <2% 6 Damp 7 Poor medium granular 8 Loose, not cohesive	1 40-70cm 2 Diffuse, regular 3 2.5y 6/4 (ochre) 4 Loamy sand 5% stones at 40-45cm 5 depth 6 Damp poor medium sub angular 7 blocky 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
39	√	TM 645963 264422	1.2	90	Wheat stubble - 70% bare soil, vehicle wheel ruts	1 0-46cm 2 Diffuse, regular 3 2.5Y 5/3 4 Loamy sand Stony layer at 32-46cm 5 (approx 5-8%) 6 Damp 7 Poor medium granular 8 Loose, not cohesive	1 46-85cm 2 Diffuse, regular 3 2.5y 6/4 (ochre) 4 Loamy sand 5 <1% 6 Damp poor medium sub angular 7 blocky 8 Loose, not cohesive	1 >85cm 2 3 2.5y 6.4/ochre - very light 4 Coarse sand 5 6 7 8 Loose	UXO rad (α) rad (β) rad (γ)
40	√	TM 646010 264321	0	No slope aspect	Coniferous plantation (*Pinus nigra*) 20m in height, birch and bracken understorey. Groundcover: mosses, <10% bare soil	1 0-6cm 2 Sharp/irregular 3 2.5y 3/2 4 Loamy sand 5 No stones 6 Damp Poor medium sub-angular 7 blocky. 8 Loose, not cohesive	1 6->80cm 2 Diffuse 3 2.5y 4/6 4 Sand/loamy sand 5 <2% stones 6 Damp 7 None 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) See data for other locations in Kenton Hills auger sheets
41	√	TM 645654 264221	0	No slope aspect	99% bare soil. Some weed growth, soft-firm	1 0-39cm 2 Diffuse, irregular 3 2.5y 5/3 4 Loamy sand 5 No stones 6 Damp 7 Poor medium granular 8 loose, not cohesive	1 39-68cm 2 Diffuse, irregular 3 2.5y 6/4 4 Loamy sand 5 No stones 6 Damp poor medium sub angular 7 blocky 8 loose, not cohesive	1 68-98cm 2 Diffuse 3 2.5y 6/5 4 Loamy sand 5 <5% stone 6 Damp 7 none 8 loose, not cohesive	UXO rad (α) rad (β) rad (γ)
42	√	TM 645413 264098	2	~2	99% bare soil. Some weed growth, soft-firm	1 0-40cm 2 Diffuse, irregular 3 2.5y 5/3 4 Loamy sand 5 No stones, 25-39cm 2% ston 6 Damp Poor medium to fine 7 granular 8 loose, not cohesive	1 40-72cm 2 Diffuse, irregular 3 2.5y 6/4 4 Loamy sand 5 <2% stones 6 Damp poor medium sub angular 7 blocky 8 loose, not cohesive	1 72-96cm 2 Diffuse 3 2.5y 6/4 4 Loamy sand/sand 5 No stones 6 Damp 7 none 8 loose, not cohesive	UXO rad (α) rad (β) rad (γ)
43	√	TM 645740 264216	0	No slope aspect	Coniferous woodland 20m in height, birch and bracken understorey. Ground flora: mosses, <10% bare soil.	Organic horizon. 7-8cm 1 mainly litter 2 Sharp, regular Mainly bright orange + bright 3 brown fermentation layer 4 organic matter 5 no stones 6 Damp under needle litter 7 organic matter; soft. 8 loose	1 A1 8-12cm 2 Diffuse, regular Grey sand with OM 2.5y 3 3/2 (black) 4 Loamy sand 5 No stones 6 Damp Loose + crumbly, no 7 structure 8 loose, not cohesive	1 12-75cm 2 diffuse, regular 3 2.5y 4/2 4 Loamy sand 5 ~ 2-5% stones below 40cm 6 Dry 7 none 8 loose, not cohesive	UXO rad (α) rad (β) rad (γ) >75cm. 2.5y 4/6 very coarse sand - stony. No cohesion, very loose + crumbly.
44	√	TM 645825 264292	0	No slope aspect	Wheat stubble. 70% bare soil	1 0->90cm 2 80-90cm mottles of organic ? 3 2.5y 5/3 4 Loamy sand 5 No stones 6 Damp 7 Poor fine granular 8 loose, not cohesive	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)

45	√	TM 646200 264845	<0.5	187 s	95% soil, 5% vegetation. Newly sown winter cereals	1 0-31cm 2 Diffuse, irregular 3 2.5y 5/3 4 Loamy sand 5 No stones 6 Slightly damp 7 Poor medium to fine granular 8 loose, not cohesive	1 31-61cm 2 Diffuse, irregular 3 2.5y 6/4 4 Loamy sand 5 No stones 6 Damp 7 poor medium sub angular blocky 8 loose, not cohesive	1 61-98cm 2 Diffuse 3 2.5y 6/4 (light) 4 Loamy sand/sand with depth 5 <2% stones 6 Damp 7 none 8 loose, not cohesive	UXO rad (α) rad (β) rad (γ)
46	√	TM 646270 264973	<1	160	Newly sown winter wheat(?) 70-80% bare ground	1 0-40cm 2 diffuse, regular 3 2y 5/3 4 Loamy sand 5 Stones 2% 6 Damp 7 Poor medium to fine granular 8 Very loose, not cohesive	1 40-75cm 2 diffuse, regular 3 2.5y 5/4 4 Coarse sand 5 Stoneless 6 Moist 7 very poor medium sub-angular blocky 8 More compact	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
47	√	TM 646825 264292	1	160	Mixed woodland windbreak.	1 Organic horizon - 10cm 2 Diffuse, irregular 3 2.5y 3/2 (black) 4 Loamy sand 5 No stones 6 Damp 7 organic - loose 8 No cohesion	1 A1: 10-28cm 2 Diffuse, irregular 3 2.5y 5/2 4 Loamy sand - sandy with c 5 No stones 6 Damp 7 no structure 8 No cohesion	1 B1: 28-80cm 2 3 2.5y 5/3 4 Loamy sand 5 no stones 6 Damp 7 no structure 8 No cohesion	UXO rad (α) rad (β) rad (γ) Strip of young woodland - conifers with understorey of young elm, nettles, lots of leaf litter Organic horizon with sand particles throughout
48	√	TM 646280 264716	4-5	30	Coniferous woodland height 20m. Bracken + bramble understorey. Ground flora: leaf, litter, mosses.	1 0-11cm organic matter 2 Mainly litter - pine 3 Sharp boundary needles 4 Organic 5 Stoneless 6 Damp 7 organic 8 Very loose	1 A1: 11-15cm 2 Diffuse, regular 3 Grey sand with OM 2.5y 3/2 (black) 4 Loamy sand 5 Stoneless <1% 6 Damp 7 very poor medium sub-angular blocky 8 Very loose	1 B: >15cm 2 Diffuse, regular 3 2.5y 4/6 - orange/ochre colour 4 loamy sand 5 Stoneless 6 Damp 7 none 8 Loose, no cohesion	UXO rad (α) rad (β) rad (γ)
49	√	TM 646112 264580	157	~1	Parsnips under net mulch. ~80% vegetation cover, 20% bare soil.	1 0-36cm 2 Diffuse, irregular 3 2.5y 5/3 4 Loamy sand 5 No stones 6 Slightly damp 7 Poor medium to fine granular 8 loose, not cohesive	1 36-100cm 2 Diffuse 3 2.5y 6/4 4 Sand 5 No stones 6 Damp 7 very poor medium blocky 8 loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
50	√	TM 646235 264583	2-3	235	Coniferous woodland: Scots pine + Pinus nigra more dense than before	1 0-4cm organic horizon 2 Sharp boundary 3 orange/light brown 4 Organic 5 No stones 6 Damp 7 organic 8 Loose, no cohesion	1 A1: 4-14cm 2 Diffuse 3 Greyish 2.5y 3/2 4 Loamy sand 5 no stones 6 Damp 7 none 8 Loose, no cohesion	1 B: 14cm - 48cm 2 Diffuse 3 2.5y 4/6 4 Loamy sand 28cm - stones shallow layer 5 <5% 6 Damp 7 none 8 Loose, no cohesion	UXO rad (α) rad (β) rad (γ) Horizon 4 - >48cm, 2.5y 5/6, loamy sand, more coarse, very orange/ochre
51	√	TM 646358 264648	<1	No slope aspect	Broadleaf plantation woodland - sweet chestnut, oak, hazel, beech, lots of leaf litter	1 A1: 0- 10 / 14cm 2 Diffuse, regular 3 2.5y 2/1 (black). Dark brown with layer or OM 4 Loamy sand with OM 5 No stones 6 Damp 7 none 8 Loose, no cohesion	1 B1: 14-82 2 Diffuse, regular 3 2.5y 4/6 (orange/ochre) 4 Loamy sand 5 No stones 6 Damp 7 none 8 Loose, no cohesion	1 B2: >82 cm 2 Diffuse, regular 3 2.5y 5/3 - slightly brown 4 Loamy sand 5 No stones 6 Damp 7 none 8	UXO rad (α) rad (β) rad (γ)
52	√	TM 646436 264691	0	No slope aspect	Coniferous woodland as before (location 50) but less dense canopy cover	1 0-10cm organic horizon 2 Diffuse, regular 3 Mainly litter/organic matter 4 Loamy sand 5 No stones 6 Damp 7 organic 8 Loose, no cohesion	1 A1: 10-17cm 2 Diffuse, regular 3 2.5 3/2 4 Loamy sand - grey with so 5 No stones 6 Damp 7 poor sub angular blocky 8 Loose, no cohesion	1 B1: 17-48cm 2 Diffuse, regular 3 2.5y 4/4 - mid brown 4 Loamy sand 5 No stones 6 Damp 7 none 8 Loose, no cohesion	UXO rad (α) rad (β) rad (γ) B2 (Horizon 4) - >48, diffuse regular, 2.5y 5/6, loamy sand, no stones, damp, loose - no cohesion
53	√	TM 646504 264638	0	No slope aspect	Scots + Corsican pine, bracken understorey	1 A1: 0 - 8cm 2 Diffuse, regular 3 2.5 3/2 4 Loamy sand - grey with some 5 No stones 6 Damp 7 very poor medium granular 8 No structure, loose OM layer - 2cm	1 B1: 8-64cm 2 Diffuse, regular 3 2.5y 4/4 - mid brown 4 Loamy sand 5 No stones 6 Quite dry 7 very poor sub angular blocky 8 No structure, loose	1 B2: >64cm 2 Diffuse 3 2.5y 5/6 4 Soft dry sand 5 No stones 6 Dry 7 none 8 No structure, loose	UXO rad (α) rad (β) rad (γ) NB: previous drill location on border of Dunwich Forest and Hilltop cover

54	√	TM 646424 264793	0	No slope aspect	Coniferous woodland, dense bracken understorey. In clearing with birch + sweet chestnut	1 0-3cm organic litter layer - sh 2 Diffuse, regular 3 2.5y 3/2 4 Loamy sand with some OM 5 No stones 6 Damp 7 very poor medium granular 8 Loose, not cohesive	1 B1: 9-31cm 2 Diffuse, regular 3 2.5 4/4 - mid brown 4 Loamy sand 5 2% stones 6 Dry 7 very poor sub angular blocky 8 Loose, not cohesive	1 B2: >31 2 Diffuse, regular 3 2.5 5/6 - ochre 4 Loamy sand - soft loose san 5 6 Dry 7 none 8 Loose	UXO rad (α) rad (β) rad (γ)
55	√	TM 646357 264804	0	No slope aspect	Coniferous woodland, Corsican pine + silver birch - no understorey in this area, lots of leaf litter	1 L+F horizons: 10cm 2 Sharp boundary 3 Dark brown/orange 4 Organic matter/litter 5 No stones 6 Damp 7 very poor medium granular 8	1 A1: 10-12cm 2 Diffuse, regular 3 2.5y 3/2 (grey) 4 Loamy sand 5 2% stones 6 Dry 7 very poor sub angular blocky 8	1 B1: 12-40cm 2 3 2.5y 4/4 (mid brown) 4 Loamy sand 5 26-40cm stony layer 6 Dry 7 none 8 Loose sand	UXO rad (α) rad (β) rad (γ) NB: Dryness is limiting the ability to retrieve sample. B2 Horizon 4- 40->50cm, 2.5y 5/6 (ochre), loamy sand, dry, loose sand

SIZEWELL AGRICULTURAL LAND CLASSIFICATION RECORD SHEET

Location: Sizewell South	Date: 2.11.10	Surveyor(s): SH, SR, RE	Weather: Cloudy but clear and bright	Page No: 1-4

Criteria: 1 depth, 2 boundary, 3 colour + mottles, 4 texture, 5 stoniness, 6 moisture status, 7 structure, 8 consistency (erosion)

Auger No	POWRA	GPS (8)	Slope (deg)	Aspect (deg)	Land Use/ surface vegetation	Horizon 1	Horizon 2	Horizon 3	Comments (inc UXO/rad)
56	√	TM 646198 262730	None	None	Net mulch covering parsnip crop with vehicle tracks at 10-15m intervals. Approx 10% bare soil	1 0-36cm 2 Diffuse, regular 3 2.5y 5/3 (mid brown) 4 Loamy sand 5 1% 6 Damp 7 poor medium granular 8 Loose, not cohesive	1 36-83cm 2 Diffuse, regular 3 2.5y 4/6 4 Loamy sand 5 Stoneless 6 Damp 7 poor medium sub-angular 8 Loose, not cohesive	1 >82cm 2 Diffuse, regular 3 2.5y 6/4 - ochre 4 5 Stoneless 6 Damp 7 none 8 Loose, not cohesive	UXO rad (α) rad (β) rad (γ)
57	√	TM 646267 262563	1-2°	350°	Net mulch covering parsnip crop with vehicle tracks at 10-15m intervals. Approx 10% bare soil	1 0-40cm 2 Diffuse, irregular 3 2.5Y 5/3 4 Loamy sand 5 Stones - on surface layer 2% 6 Damp 7 poor medium granular 8 Loose, not cohesive	1 40 - >100cm 2 Diffuse, irregular 3 2.5Y 6/4 4 Loamy sand 5 Stoneless 6 Damp 7 poor medium sub-angular 8 Loose, not cohesive	1 2 3 4 5 6 7 none 8	UXO rad (α) rad (β) rad (γ)
58	√	TM 646142 262583	1-2°	350°	Net mulch covering parsnip crop with vehicle tracks at 10-15m intervals. Approx 10% bare soil	1 0-38cm 2 Diffuse, regular 3 2.5y 5/3 (mid brown) 4 Loamy sand 5 Stones 10% on surface 6 Damp 7 poor medium to fine granular 8 Loose, not cohesive	1 38-71cm 2 Diffuse, regular 3 2.5y 4/6 4 Loamy sand 5 No stones 6 Damp 7 poor medium sub-angular 8 Loose, not cohesive	1 >71cm 2 Diffuse, regular 3 2.5y 6/4 4 Loamy sand 5 No stones 6 Damp 7 none 8 Soft sand, not cohesive	UXO rad (α) rad (β) rad (γ) Surface of soil is stony 10% but profile shelf isn't stony
59	√	TM 646403 262702	None	None	Former onion field - currently weedy and bare soil 80%	1 0-46cm 2 Diffuse, regular 3 2.5y 5/3 4 Loamy sand 5 Stony layer at 37cm (5-10%) 6 Damp 7 poor medium to fine granular 8 Loose, not cohesive	1 46-75cm 2 Diffuse, regular 3 2.5y 6/4 (ochre) 4 Loamy sand Stones - 2% more around 5 70cm 6 Damp 7 poor medium sub-angular 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
60	√	TM 645566 262605	<1°	None	Former onion field - currently weedy and bare soil 80%	1 0-39cm 2 Diffuse, regular 2.5y 3/2 - more organic matter content than other 3 fields 4 Loamy sand 5 Stones 10% 6 Damp 7 poor medium granular 8 Loose, not cohesive	1 39-75cm 2 Diffuse, regular 3 2.5y 6/4 (ochre) 4 Loamy sand - very coarse 5 Gravelly - 10% 6 Damp 7 none 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) **NB: Very stony surface soil - more than previous 15-20% stones**
61	√	TM 646039 262824	<1°	None	Wheat stubble field, 70% bare soil (stony soil on surface)	1 0-36cm 2 Diffuse, regular 3 2.5y 5/3 4 Loamy sand 5 Stones in surface layer 6 Damp 7 poor medium to fine granular 8 Loose, not cohesive	1 36->85cm 2 Diffuse, regular 3 2.5y 6/4 (ochre) 4 Loamy sand 5 No stones 6 Damp 7 none 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
62	√	TM 646152 262861	<1°	None	Wheat stubble field, 70% bare soil (stony soil on surface)	1 0-45cm 2 Diffuse, regular 3 2.5y 5/3 4 Loamy sand 5 Stone layer at 35-45 cm depth 6 Damp 7 poor fine granular 8 Loose, not cohesive	1 45->68cm 2 3 2.5y 6/4 4 Loamy sand 5 Stones throughout 6 Damp 7 none 8 Not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) Stones on surface soil 5-10% - Auger hole limited in depth by stone layer

63	√	TM 646205 263046	Flat	None	Wheat stubble field, 70% bare soil (stony soil on surface)	1 0-36cm 2 Diffuse, regular 3 2.5y 5/3 4 Loamy sand 5 Stoneless, apart from on top surface 6 Damp 7 poor medium to fine granular 8 Loose, not cohesive	1 36-95cm 2 Diffuse 3 2.5y 4/6 4 Loamy sand 5 No stones 6 Damp 7 poor medium sub-angular 8 Not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
64	√	TM 646038 263086	-	-	Wheat stubble field, 70% bare soil (stony soil on surface)	1 0-30cm 2 Diffuse, regular 3 2.5y 5/3 4 Loamy sand 5 stony lay 6 Damp 7 poor medium to fine granular 8 Loose	1 30-94cm 2 Diffuse, regular 3 2.5y 6/4 4 Loamy sand 5 Between 30-37cm - generally stony throughout 2-5% 6 Damp 7 poor medium sub-angular 8 Loose	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
65	√	TM 645924 262981	-	-	Wheat stubble field, 70% bare soil (stony soil on surface)	1 0-58cm 2 Diffuse, regular 3 2.5y 5/3 4 Loamy sand 5 Stones 2% throughout 6 Moist 7 poor medium granular 8 Loose, not cohesive	1 58-84cm 2 Diffuse, regular 3 2.5y 6/4 4 Loamy sand, more coarse 5 Stones 5% 6 Moist 7 poor medium sub-angular 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
66	√	TM 645812 262954	3°	20°	Very recently harrowed/ ploughed + sown. 100% bare soil currently	1 0-40 2 diffuse, regular 3 2.5y 5/3 4 Loamy sand 5 No stones 6 Damp, dry on surface but looks more compact 7 poor medium to fine granular 8 Loose, not cohesive	1 40-85cm 2 3 2.5y 3/3 - Dark reddish brown 4 Loamy sand - but more coarse 5 no stones 6 Damp 7 poor medium sub-angular 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
67	√	TM 645887 262767	<1°	None	Very recently harrowed/plo ughed + sown. 100% bare soil currently	1 0-40cm 2 Diffuse, regular 3 2.5y 5/3 4 Loamy sand 5 No stones 6 Moist/wet 7 poor medium to fine granular 8 Loose, not cohesive	1 40-87cm 2 Diffuse, regular 3 2.5y 6/4 4 Loamy sand 5 stony layer at around 40cm 6 Moist/wet 7 poor medium sub-angular 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
68	√	TM 645934 262643	-	-	Very recently harrowed/plo ughed + sown. 100% bare soil currently	1 35-40cm 2 Diffuse, regular 3 2.5y 5/3 4 Loamy sand 5 No stones 6 Moist 7 poor medium to fine granular 8 Loose, not cohesive	1 40-55cm 2 Diffuse, regular 3 2.5y 6/4 4 Loamy sand 5 No stones 6 Moist 7 poor medium sub-angular 8 Loose, not cohesive	1 55->88cm 2 3 2.5y 6/4 4 Loamy sand 5 No stones 6 Moist 7 None 8 More cohesive, almost stiff	UXO rad (α) rad (β) rad (γ)
69	√	TM 645018 262688	-	-	Abandoned rough + unmanaged land. Largely grasses, weeds + bare stony ground	1 0-46cm 2 Diffuse, regular 3 2.5y 5/3 4 Loamy sand 5 Stones 2-3% throughout 6 Moist/wet 7 poor medium granular 8 Loose, not cohesive	1 46-97cm 2 3 2.5y 4/6 (not quite ochre) 4 Loamy sand 5 6 Moist/wet 7 None 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ)
70	√	TM 646014 262602	-	-	Fenced off area of abandoned, disturbed land - bare soil, stones, perennials + weeds	1 0-28cm - zone of mixed mineral soil + charcoal 2 Diffuse and irregular 3 10 YR 3/1 with sand particles 2.5Y 6/2 4 Very dark soil, with apparently added organic matter 5 few stones (~2-3%) 6 Damp 7 dry crumbly organic matter 8 Loose, not cohesive	1 28-68cm 2 Diffuse, regular 3 2.5y 5/3 (mid-brown) 4 Loamy sand 5 No stones 6 Damp 7 none 8 Loose, not cohesive	1 68-91cm 2 Diffuse, regular 3 2.5y 6/4 4 loamy sand 5 No stones 6 Damp 7 None 8 Loose, not cohesive	UXO rad (α) rad (β) rad (γ) Area used for peat incorporation trials? >91cm - turns to stiff + cohesive sandy loam - no stones
71	√	TM 646077	<1°		Rough, disturbed land, bare soil, weeds, with	1 0-53-60cm 2 Diffuse, regular 3 2.5y 5/3 4 Loamy sand	1 60->98cm 2 3 2.5y 4/6 (slightly lighter than ochre 4 Coarse sand	1 2 3 4	UXO rad (α) rad (β) rad (γ)

		262503			with perennials + annuals - stony soil	5 few stones (~2-3%) 6 Damp 7 poor medium granular 8 Loose, not cohesive	5 No stones 6 Damp 7 None 8 Loose, not cohesive	5 6 7 8		

SIZEWELL AGRICULTURAL LAND CLASSIFICATION RECORD SHEET

Location: Goose Hill	Date: 3.11.10	Surveyor(s): RE	Weather: Clear, slightly overcast	Page No: 1-4

Criteria: 1 depth, 2 boundary, 3 colour + mottles, 4 texture, 5 stoniness, 6 moisture status, 7 structure, 8 consistency (erosion)
NB: for ALC purposes, profile descriptions of mineral soil horizons only.

Auger No	POWRA¹	GPS (8)	Slope	Aspect (deg)	Land Use/ surface vegetation	Horizon 1	Horizon 2	Horizon 3	Comments (inc UXO/rad)
72	√	TM 647295 264589	E	1	Coniferous forest plantation, predominantly Scots Pine height ~20 - 25m with open canopy. Understorey; bracken with high density of leaves and mulch	1 0-9cm 2 distinct, variable 3 2.5y 3/2 4 loamy sand 5 no stones 6 damp 7 None 8 loose, not cohesive	1 9-13cm 2 diffuse 3 2.5y 5/6 4 loamy sand 5 no stones 6 damp 7 Poor medium angular blocky. 8 loose, not cohesive	1 13-92cm 2 diffuse 3 2.5y 5/6 4 sand - loamy sand 5 no stones 6 damp 7 none 8 slightly cohesive	UXO; no evidence rad (α) rad (β) rad (γ)
73	√	TM647261 264734	SE	<0.5	As above with lighter ground cover, bracken ~ 90% with moss understorey	1 0-4cm 2 distinct, variable 3 2.5y 3/2 4 loamy sand 5 no stones 6 damp 7 Poor medium sub-angular blocky. 8 loose, not cohesive	1 4-53cm 2 diffuse 3 2.5y 5/6 4 <2% stones 5 loamy sand 6 damp 7 none 8 loose, not cohesive	1 53-98cm 2 diffuse 3 2.5y 5/6 (lighter) 4 sand - loamy sand 5 no stones 6 damp 7 none 8 very loose	UXO; none encountered rad (α) rad (β) rad (γ)
74	√	TM 647162 264825	level	0	Coniferous plantation, predominantly Scots Pine, height ~20 - 25m with open canopy. Understorey; bracken with high density of leaves and mulch	1 0-2cm, 2 distinct, variable 3 2.5y 3/2 4 loamy sand 5 no stones 6 damp 7 Poor medium sub-angular blocky. 8 loose, not cohesive	1 2-40cm 2 diffuse 3 2.5y 4/6 4 <2% stones 5 loamy sand 6 damp 7 Poor medium sub-angular blocky. 8 loose, not cohesive	1 40-98cm 2 diffuse 3 2.5y 5/6 4 loamy sand / sand 5 <2% stones 6 damp 7 none 8 very loose	UXO; none encountered rad (α) rad (β) rad (γ)
75	√	TM 647091 264729	level	0	Coniferous plantation, predominantly Scots Pine, height ~20 - 25m with open canopy. Understorey; bracken with high density of leaves and mulch	1 0-8cm 2 distinct, variable 3 2.5y 3/2 4 loamy sand 5 no stones 6 damp 7 Poor medium sub-angular blocky. 8 loose, not cohesive	1 8-44cm 2 diffuse 3 2.5y 4/6 4 <2% stones 5 loamy sand 6 damp 7 Poor medium sub-angular blocky. 8 loose, not cohesive	1 44-89cm 2 diffuse 3 2.5y 5/6 4 loamy sand / sand 5 no stones 6 damp 7 none 8 very loose	UXO; none encountered rad (α) rad (β) rad (γ)
76	√	TM 646949 264739	SE	~10	Mixed woodland with horse chestnut, pine; height ~35m. Ground cover bracken with patchy grass.	1 0-8cm 2 distinct, variable 3 2.5y 3/2 4 loamy sand 5 no stones 6 damp 7 Poor medium sub-angular blocky. 8 loose, not cohesive	1 8-73cm 2 diffuse 3 2.5y 4/6 (sandy brown) 4 loamy sand 5 <2% stones 6 damp 7 none 8 loose, not cohesive	1 73-98cm 2 diffuse 3 2.5y 5/6 4 loamy sand / sand 5 <2% stones 6 damp 7 none 8 very loose	UXO; none encountered rad (α) rad (β) rad (γ)
77	√	TM 646896 264663	S	1.5	Scots pine 60% canopy, height ~30m. Groundcover: 10% bracken, 30% moss	1 0-9cm 2 distinct, variable 3 2.5y 3/2 4 loamy sand 5 no stones 6 damp 7 Poor medium sub-angular blocky. 8 loose, not cohesive	1 9-97cm 2 diffuse 3 2.5y 4/6 4 loamy sand 5 <2% stones 6 damp 7 none 8 loose, not cohesive	1 97->100cm 2 diffuse 3 2.5y 5/6 4 loamy sand 5 <2% stones 6 damp 7 none 8 very loose	UXO; none encountered rad (α) rad (β) rad (γ)
78	√	TM 646717 264717	S	~0.5	Scots pine open canopy. ~70% tree cover. Height ~ 20-25m. Groundcover sparse 50% bracken, moss and grasses	1 0-2cm, 2 Distinct, variable 3 2.5y 3/2 4 Loamy sand 5 2% stone 6 Damp 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 2-98cm 2 Diffuse 3 2.5y 5/6 4 loamy sand/sand 5 <2% stones 6 Damp 7 None 8 Loose, firm/stiff	1 2 3 4 5 6 7 8	UXO; None detected rad (α) rad (β) rad (γ)

79	√	TM 646787 264624	S	~1-1.5	Scots pine open canopy ~70% tree cover. Height ~ 20-25m. Groundcover sparse: 50% bracken, moss and grasses	1 0-6cm 2 Distinct, variable 3 2.5y 3/2 4 Loamy sand 5 <2% stones 6 Damp/moist 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 6-97cm 2 Diffuse 3 2.5y 5/6 4 loamy sand/sand 5 No stones 6 Damp/moist with 7 None 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO; None detected rad (α) rad (β) rad (γ)
80	√	TM 647010 264565	S	2	Scots pine open canopy. Height ~30m. Groundcover: bracken + grasses. Leaf base, bracken leaves + shoots	1 0-11cm 2 Distinct, variable 3 2.5y 3/2 4 Loamy sand 5 <2% stones 6 moist 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 11-14cm 2 diffuse 3 2.5y 4/6 4 Loamy sand 5 no stones 6 moist 7 None 8 Loose, not cohesive	1 11-98cm 2 diffuse 3 2.5y 4/6 4 Sand/loamy sand 5 no stones 6 Damp 7 None 8 V. loose	UXO;None detected rad (α) rad (β) rad (γ)
81	√	TM 647159 264550	S	1	Scots pine open canopy, Height ~ 30m. Groundcover: bracken + grasses. Leaf base, bracken leaves + shoots	1 0-8cm 2 distinct, variable 3 2.5y 3/2 4 loamy sand 5 None 6 Damp 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 8-98cm 2 Diffuse 3 2.5y 5/6 4 Sand/loamy sand 5 <2% stones 6 Damp 7 None 8 V. loose	1 2 3 4 5 6 7 8	UXO; None detected rad (α) rad (β) rad (γ)
82	√	TM 646650 264595		0	Young mixed saplings in plastic deer protection. Height ~6ft. Groundcover, thick bracken + brambles	1 0-12cm 2 distinct, variable 3 2.5y 5/2 4 Loamy sand 5 <2% stones 6 Moist 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 12-74cm 2 diffuse 3 2.5y 4/6 4 Loamy sand 5 No stones 6 Moist 7 None 8 Loose, not cohesive	1 74-110cm 2 diffuse 3 2.5y 5/6 4 Loamy sand 5 <2% stones 6 Damp 7 none 8 Loose, not cohesive	UXO; None detected rad (α) rad (β) rad (γ)
83 (turf pits)	√	TM 646447 264548		0	Young mixed woodland. Height ~15-20m. Open canopy. Understorey, v. soft under foot, boggy. Groundcover: brambles, nettles	1 0-100cm 2 Distinct ? 3 2.5y 3/2 dark brown peat 4 Loamy sand 5 No stones 6 Wet 7 none 8 Soft peat/silt texture	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	UXO; location moved rad (α) rad (β) rad (γ) Initial location moved due to detection of UXO body.
84	√	TM 646335 264470	N	<0.5	Mixed woodland, Height 10-20m. Groundcover: bracken + brambles	1 0-10cm 2 Distinct, variable 3 2.5y 3/2 4 loamy sand 5 None 6 Moist 7 Poor medium sub-angular blocky. 8 loose, not cohesive	1 10-110cm 2 diffuse 3 2.5y 5/6 4 Sand/loamy sand 5 No stones 6 Moist 7 None 8 V. loose	1 2 3 4 5 6 7 8	UXO; None detected rad (α) rad (β) rad (γ)
85	√	TM 646238 264371	N	0	Young pine trees. Height 30m-35m high. 10-20% canopy. Understorey: bracken 5%, mosses 5%	1 0-11cm 2 Distinct, variable 3 2.5y 3/2 4 loamy sand 5 <2% stones 6 Moist 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 11-35cm 2 diffuse 3 2.5y 4/6 4 Loamy sand <2% stones, 5% stones at base 5 6 Damp 7 None 8 Loose, not cohesive	1 35-89cm 2 diffuse 3 2.5y 5/6 4 Sand/loamy sand 5 no stones 6 damp 7 none 8 V. loose	UXO; detected - therefore position moved rad (α) rad (β) rad (γ) Initial location moved on advice of UXO surveyor

* POWRA = Point of Work Risk Assessment

Location: Kenton Hill	**Date:** 4.11.10	Surveyor(s): RE	**Weather**: Clear	**Page No:** 1-3

150	√	TM 646120 264346	N	0	Young pine trees 30m-35m high. 10-20% canopy. Understorey: bracken 5%, mosses 5%	1 0-5cm 2 distinct 3 2.5y 3/2 4 Loamy sand 5 <2% stones 6 Moist 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 5-11cm 2 Diffuse 3 2.5y 4/6 4 Loamy sand 5 <2% stones 6 Damp 7 None 8 Loose, not cohesive	1 11-98cm 2 Diffuse 3 2.5y 5/6 4 Sand/loamy sand 5 <2% stone 6 Damp 7 None 8 V. loose	UXO; None detected rad (α) rad (β) rad (γ) Stony, 5% at 35-45

151	√	TM 646022 264293	N	<0.5	Pine: sparse 10-20% canopy Understorey: bracken 98%, mosses 2%. Ground: pine needles and bracken shoots	1 0-5cm 2 Distinct variable 3 2.5y 3/2 4 Loamy sand 5 No stones 6 Moist 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 5-98cm 2 Diffuse 3 2.5y 4/6 4 Sand (m)/loamy sand in upper part of horizon 5 <2% stones 6 Damp 7 None 8 V. loose	1 2 3 4 5 6 7 8	UXO; None detected rad (α) rad (β) rad (γ)
152	√	TM 645925 264248	W	<0.5	Mature pines Height ~30-35m. Canopy 30-40%. Groundcover: bracken 90%, nettles + moss 10%. Bracken compost base	1 0-5cm 2 Distinct 3 2.5y 3/2 4 Loamy sand 5 5% stones 6 Moist 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 5-18cm 2 Diffuse 3 2.5y 4/6 4 Sand/loamy sand 5 <2% stones 6 Moist 7 None 8 Loose, not cohesive	1 18-98cm 2 Diffuse 3 2.5y 5/6 4 Sand/loamy sand 5 No stones 6 Moist 7 None 8 V. loose	UXO; none detected rad (α) rad (β) rad (γ)
153	√	TM 645811 264186	W	0.5/1.0	Mature pines. Height ~30-35m. Canopy 20-30%. Groundcover, bracken 80%, brambles 15%, moss 5%. Pine needles + bracken base	1 0-4cm 2 Distinct 3 2.5y 3/2 4 Loamy sand 5 <2% stones 6 Moist 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 4-26cm 2 Diffuse 3 2.5y 4/6 4 Loamy sand 5 5% stones 6 Damp 7 Poor medium to coarse angular blocky. 8 Loose, not cohesive	1 26-100cm 2 Diffuse 3 2.5y 4/6 4 Coarse sand 5 5% stones 6 Damp 7 None 8 V. loose	UXO; None detected rad (α) rad (β) rad (γ) 2.5y 5/6 at vegetation base of auger (i.e. >98cm)
154	√	TM 645704 264115	W	<0.5	Mature pines. Height ~30-35m. Canopy 20-25%. Groundcover: bramble, bracken.	1 0-15cm 2 Diffuse 3 2.5y 3/2 4 Loamy sand 5 <2% stones 6 Moist 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 15-73cm 2 Diffuse 3 2.5y 4/6 4 Loamy sand 5 5% stones 6 Damp 7 Poor medium to coarse angular blocky. 8 Loose, not cohesive	1 73-98cm 2 Diffuse 3 2.5y 5/6 4 Loamy sand 5 No stones 6 Moist 7 None 8 V. loose	UXO; None detected rad (α) rad (β) rad (γ)
155	√	TM 645608 264045	W	3	Mixed woodland with mature pine + mixed broadleaves. Height ~30m/15m. Ground is low lying, with bracken + brambles ~50/50%	1 0-3cm 2 Distinct 3 2.5y 3/2 4 Loamy sand 5 No stones 6 Moist 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 3-24cm 2 Diffuse 3 2.5y 4/6 4 Loamy sand 5 <2% stones 6 Damp 7 None 8 Loose, not cohesive	1 26-98cm 2 Diffuse 3 2.5y 5/6 4 Loamy sand 5 No stones 6 Damp 7 None 8 V. loose	UXO; None detected rad (α) rad (β) rad (γ)
156	√	TM 645467 263965	NE	1	Beech. Height ~10-12m. 50-60% canopy, semi-closed. Groundcover: bare soil + sparse weeds with some 10% brambles, light leaf cover	1 0-15cm 2 Distinct 3 2.5y 3/2 4 Loamy sand 5 <2% stones 6 Damp 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 15-71cm 2 Diffuse 3 2.5y 4/6 4 Loamy sand 5 No stones (0.36-0.45 <2% 6 Moist 7 None 8 Loose, not cohesive	1 71-98cm 2 Diffuse 3 2.5y 5/6 4 Sand/loamy sand 5 No stones 6 Moist 7 None 8 V. loose	UXO; None detected rad (α) rad (β) rad (γ)
157	√	TM 645343 263928	E	<0.5	Mixed deciduous woodland: mature oak with horse chestnut, young beech. Height: 8-35m. Groundcover: shrubs with sparse nettles.	1 0-2cm 2 Distinct 3 2.5y 3/2 4 Loamy sand 5 <2% stones 6 Damp 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 2-38cm 2 Diffuse 3 2.5y 4/6 4 Loamy sand 5 >2% stone 6 Moist 7 None 8 Loose, not cohesive	1 38-82cm 2 Diffuse 3 2.5y 4/6 4 Coarse sand 5 5-10% stone 6 None 7 None 8 Loose/stiff	UXO; None detected rad (α) rad (β) rad (γ) slightly lighter

158	√	TM 645399 263839	0	0	Mature mixed conifer and broadleaves: pine, oak, beech. Height ~20-35m. 50% canopy open. Groundcover: young nettles 5%. 95% open soil, some leaf cover	1 0-10cm 2 Distinct 3 2.5y 3/2 4 Loamy sand 5 No stones 6 Damp 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 10-40cm 2 Diffuse 3 2.5y 4/6 4 Loamy sand 5 <2% stones 6 Moist 7 None 8 Loose, not cohesive	1 40-96cm 2 Diffuse 3 2.5y 4/6 4 Coarse sand 5 5% stones 6 Moist 7 None 8 V. loose	UXO; None detected rad (α) rad (β) rad (γ)

Location: Kenton Hill Triangle	**Date:** 5.11.10	Surveyor(s): RE and SH	**Weather**: Overcast, slightly wet	**Page No:** 1

159	√	TM 645280 263832	0	0	left unmanaged arable land - now sparse grasses, weeds, bare ground	1 0-49cm 2 diffuse, irregular 3 2.5y 5/3 mid brown 4 Loamy sand 5 2% stones between 37-49cm depth 6 Damp 7 Poor medium sub-angular blocky. 8 Loose, not cohesive	1 49->96cm 2 diffuse, irregular 3 Slightly lighter than horizon 1 not as light/orange ochre 4 Loamy sand 5 No stones 6 Damp 7 Poor medium to coarse angular blocky. 8 Some cohesion	1 2 3 4 5 6 7 8	UXO; none detected rad (α) rad (β) rad (γ)

Location: Upper Abbey car park	**Date:** 5.11.10	Surveyor(s): RE and SH	**Weather**: Overcast, slightly wet	**Page No:** 1

160	√	TM 645216 264161	0	0	cereal stubble, bare ground	1 0-38cm 2 Diffuse, irregular 3 2.5y 5/3 4 Loamy sand 5 No stones 6 Damp 7 Poor medium to fine granular 8 loose, not cohesive	1 38-70cm 2 Diffuse, irregular 3 2.5y 6/4 4 Loamy sand 5 <2% stones 6 Damp 7 poor medium sub angular blocky 8 loose, not cohesive	1 70- >90cm 2 Diffuse 3 2.5y 6/4 4 Loamy sand/sand 5 No stones 6 Damp 7 none 8 loose, not cohesive	UXO rad (α) rad (β) rad (γ)
161	√	TM 645280 264375	0	0	cereal stubble, bare ground	1 0 - 35cm 2 diffuse, irregular 3 2.5y 5/3 4 sandy loam 5 stoneless 6 damp 7 poor medium granular structure 8 stiff to very stiff	1 35 - 80cm 2 diffuse, irregular 3 2.5y 5/3 4 sandy loam 5 2 - 3% stones at 65cm 6 damp 7 Poor med - sub-angular blocky 8 very stiff	1 >80cm 2 3 2.5y 5/3 4 loamy sand 5 no stones 6 damp 7 no structure 8 not cohesive; less stiff	UXO; none detected rad (α) rad (β) rad (γ)

SIZEWELL AGRICULTURAL LAND CLASSIFICATION RECORD SHEET

Location: Fields 1, 2, 3	Date: 3.11.10	Surveyor(s): SH,SR	Weather: Overcast, dry, light breeze	Page No: 1-4

Criteria: 1 depth, 2 boundary, 3 colour + mottles, 4 texture, 5 stoniness, 6 moisture status, 7 structure, 8 consistency (erosion)

Auger No	POWRA	GPS (8)	Slope (deg)	Aspect (deg)	Land Use/ surface vegetation	Horizon 1	Horizon 2	Horizon 3	Comments (inc UXO/rad)
Field 2 86	√	TM 647255 264054	0	No slope and no aspect	SI grassland, unmanaged. Juncus, wet tussocky	1 0-6cm 2 Diffuse, regular 3 2.5y 5/3 4 Loamy sand 5 No stones 6 Moist/wet 7 Good medium granular structure, lots of roots 8 Cohesive: soft ball consistency	1 6-40cm 2 Diffuse, regular 3 2.5y 6/4 4 Loamy sand 5 No stones 6 Wet 7 Good medium sub-angular structure-gritty 8 Cohesive: soft ball consistency	1 >40cm 2 Diffuse, regular 3 2.5y 6/4 4 Sand 5 Gritty 2% stones 6 Wet 7 no structure 8 V. coarse sand	UXO rad (α) 0.1 rad (β) 5.8 rad (γ) 0.1 Initial problem with rad meter - rectified and resumed. Water accumulating bottom of auger hole at 40cm depth
87	√	TM 647241 264151	0	No slope and no aspect	SI grassland, unmanaged. Juncus tussocks	1 0-9cm 2 Diffuse, irregular 3 5y 3/2 4 Loamy sand 5 No stones 6 Wet 7 Good medium granular structure, lots of roots 8 Cohesive: soft ball consistency	1 9-21cm 2 Diffuse 3 2.5y 5/4 4 Sandy loam 5 No stones 6 Wet 7 Poor medium sub-angular structure-gritty 8 Loose + granular, not cohesive	1 >21cm 2 Diffuse 3 5y 5/6 4 Shelly sand (coarse) shell fragments >20cm 5 6 Wet - water ponding into hole at 38cm 7 no structure 8 Loose + granular, not cohesive	UXO rad (α) 0.2 cps rad (β) 6.75 cps rad (γ) <0.1 dose rate
88	√	TM 647269 264271	0	No slope and no aspect	SI grassland, unmanaged. Tussocky but no Juncus	1 0-5 2 Diffuse, regular 3 5y 3/2 4 Loamy sand 5 No stones 6 Damp/moist 7 Poor medium granular structure, lots of roots 8 Loose, not cohesive	1 5-10 2 Diffuse, regular 3 2.5y 5/4 4 Sand 5 No stones 6 Moist/wet 7 Poor medium sub-angular structure-gritty 8 Loose, not cohesive	1 >10 2 3 2.5y 5/4 4 Coarse shelly sand 5 6 Moist/wet 7 no structure 8 Loose coarse sand	UXO rad (α) 0.3 rad (β) 4.3 rad (γ)
89	√	TM 647397 264228	0	No slope and no aspect	Wet rough SI grass not managed, small patch of Phragmites	1 0 - 6 / 10cm 2 Irregular 3 5y 3/2 4 Sandy loam - high in OM 5 No stones 6 Moist 7 Poor medium granular structure, lots of roots 8 Cohesive: soft ball consistency	1 >10cm 2 3 2.5y 5/4 4 Sandy loam 5 No stones, shelly sand throughout 6 Moist 7 Poor medium sub-angular structure-gritty 8 Cohesive: soft ball consistency	1 2 3 4 5 6 7 8	UXO rad (α) 0.06 cps rad (β) 4.8cps rad (γ) 0.2
90	√	TM 647387 264173	0	No slope and no aspect	Disturbed earth surface OM mixed with surface ochre sand	1 Top 25 cm mixture of med. Brown + ochre sand. Soft, wet, not cohesive 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	UXO rad (α) rad (β) rad (γ) 0.1
91	√	TM 647360 264170	0	No slope and no aspect	Wet rough SI grassland, tussocky - slightly disturbed	1 0-5cm 2 Sharp, irregular 3 5y 4/3 4 Loamy sand, org matter 5 No stones 6 Moist 7 no structure 8 Loose, not cohesive, lots of ro	1 5-30cm 2 Diffuse + regular 3 5y 6/3 4 Coarse shelly sand, no OM 5 No stones 6 Moist to wet 7 No structure 8 Very loose, not cohesive	1 >30cm 2 3 5y 5/6 4 Very coarse sand + shells 5 no stones 6 wet 7 Very wet and sloppy 8 Loose, not cohesive	UXO rad (α) 0 rad (β) 4.5 rad (γ) <0.1 NB: water ponding into auger hole at 28cm
92	√	TM 647367 264087	0	No slope and no aspect	Very tussocky, tall grass SI	1 0-5cm 2 Sharp + regular 3 5y 4/3 4 Loamy sand 5 No stones 6 Moist 7 No structure 8 Loose, not cohesive, lots of roots	1 5-31cm 2 Diffuse + regular 3 5y 6/3 4 Coarse sand 5 No stones 6 Moist 7 No structure 8 Very loose, not cohesive	1 >31cm 2 3 5y 5/6 4 Very loose sand 5 no stones 6 Very wet, sloppy 7 no structure 8 wet and sloppy	UXO rad (α) 0 rad (β) 4.8 rad (γ) <0.1 Organic surface horizon + subsurface horizon

93	√	TM 647466 263981	0	No slope and no aspect	Young mixed Corsican pine with broadleaves plantation woodland. Little canopy cover. Short grass ground cover.	1 0-3cm 2 Sharp + regular 3 5y 4/3 4 Loamy sand - lots of tree root 5 No stones 6 Very loose 7 No structure 8 Loose, not cohesive, lots of roots	1 3-31cm 2 Very diffuse 3 5y 6/3 4 Sand shelly 5 No stones 6 Very wet, loose 7 No structure 8 Very loose, not cohesive	1 >31cm 2 3 5y 6/3 4 Coarse shelly sand 5 no stones 6 Very wet, loose 7 No structure 8 wet and sloppy	UXO rad (α) 0 rad (β) 4.1 rad (γ) 0
94	√	TM 647481 263926	0	No slope and no aspect	As above - more dense stems- mixed broadleaf	1 0-3cm leaf litter + OM 2 Sharp, regular 3 5y 4/3 4 Leaf litter, pine needles and moss 5 No stones 6 Damp 7 No structure 8 very loose, not cohesive	1 3-13cm 2 Diffuse + irregular 3 2.5y 4/6 - with grey mottles 4 Loamy sand with fine shelly fragments 5 No stones 6 Dry 7 No structure 8 very loose, not cohesive	1 >13cm 2 3 2.5y 5/4 4 Loamy sand 5 no stones 6 very dry 7 No structure 8 very loose, not cohesive, very powdery sand	UXO rad (α) 0 rad (β) 4.3 rad (γ) 0.05
Field 1 118	√	TM 647151 264206	0	No slope and no aspect	SI Grassland field, tussocky and unmanaged	1 0-5cm 2 Diffuse, regular 3 2.5y 5/3 mid brown 4 Loamy sand - with OM, some roots 5 No stones 6 Damp 7 No structure 8 Soft ball consistency	1 5 - >82cm 2 3 2.5y 6/4 (ochre) 4 Loamy sand with shelly fragments 5 No stones - shell fragments 6 Moist/wet 7 No structure 8 Soft ball consistency	1 2 3 4 5 6 7 8	UXO rad (α) 0.06 rad (β) 5 rad (γ) 0.05 - 0.1
Field 1 119	√	TM 647109 264092	0	No slope and no aspect	SI Grassland field, tussocky and unmanaged	1 0 - 4 / 5cm 2 Diffuse, regular 3 2.5y 5/3 mid brown 4 Loamy sand - with OM, some roots 5 No stones 6 Damp 7 No structure 8 Loose, not cohesive	1 5 - >46cm 2 3 2.5y 6/4 (ochre) 4 Loamy sand with grit/gravel/small shell fragments 5 no stones 6 Wet/moist 7 No structure 8 Soft ball consistency	1 2 3 4 5 6 7 8	UXO rad (α) 0 rad (β) 4.1 rad (γ) 0-0.05 Depth of hole limited by concrete/material at 46cm depth

SIZEWELL AGRICULTURAL LAND CLASSIFICATION RECORD SHEET

NB: Cat scan of each auger hole area undertaken

Location: Sizewell B	**Date:** 4.11.10	**Surveyor(s):** SR/SH	**Weather:** Bright and dry	**Page No:** 1-6

Criteria: 1 depth, 2 boundary, 3 colour + mottles, 4 texture, 5 stoniness, 6 moisture status, 7 structure, 8 consistency (erosion)

Auger No	POWRA	GPS (8)	Slope (deg)	Aspect (deg)	Land Use/ surface vegetation	Horizon 1	Horizon 2	Horizon 3	Comments (inc UXO/rad)
95	√	TM 647219 263906	0	No slope no aspect	Young conifers + broadleaf plantation wood. Pine, birch. <5m height open canopy. Ground flora: mosses, bare ground, grasses	1 0-18cm 2 Very diffuse, regular 3 2.5y 5/4 4 Loamy sand - lots of tree root 5 Stony - ~15% 6 Damp 7 No structure 8 Loose, no cohesion	1 18-60cm 2 Diffuse, regular 3 2.5y 5/4 4 loamy sand - stains hands 5 5% 6 Damp 7 No structure 8 Very loose, no cohesion	1 >60cm 2 3 2.5y 5/4 4 Very coarse sand 5 5% small stones 6 Damp 7 No structure 8 Very loose, grainy	UXO; rad (α) 0.06 rad (β) 5.5 rad (γ) 0.05 dose rate µ Sv/h NB: Surface made ground. Evidence of concrete on surface
96	√	TM 647260 263961	0	No slope no aspect	Young conifers + broadleaf plantation wood. Pine, birch. <5m height open canopy. Ground flora: mosses, bare ground, grasses. Also gorse + Sycamore saplings	1 0-57cm 2 Diffuse, regular 3 2.5y 3/2 4 Sand 5 No stones 6 Damp 7 No structure 8 Loose, no cohesion	1 >57cm 2 Diffuse, regular 3 2.5y 5/6 4 Sand with shell fragments 5 2-5% stones 6 Wet 7 8 Very loose, grainy no cohesion	1 2 3 4 5 6 7 8	UXO; rad (α) rad (β) rad (γ) Proximity to Sizewell B. No RAD undertaken. Therefore not hand textured.
97	√	TM 647298 263922	0	No slope no aspect	Very young broadleaf plantation woodland, saplings <2m, gorse patches grassland, no canopy cover	1 0-11cm 2 Irregular, sharp 3 2.5y 5/3 4 Loamy sand - lots of tree root 5 No stones 6 Damp 7 Moderately good medium granular structure 8 loose, not cohesive	1 11-35cm 2 Hit mostly ground/rock at base of this layer 3 2.5y 6/4 4 Sand with shell fragments 5 Stones <1% 6 Damp 7 none 8 solid	1 2 3 4 5 6 7 8	UXO; rad (α) 0 rad (β) 5.1 cps rad (γ) 0.05 dose rate µ Sv/h
98	√	TM 647376 263845	0	No slope no aspect	Immediately north of Sizewell B in young, closed canopy mixed woodland with grassy understorey	1 0-11cm 2 diffuse, irregular 3 2.5y 4/6 4 Loamy sand - lots of tree root 5 No stones 6 Dry 7 Good crumb structure 8 loose, not cohesive	1 11-45cm 2 diffuse, irregular 3 2.5y 5/6 4 Loamy sand 5 No stones 6 Dry 7 Powdery, no structure 8 loose, not cohesive	1 >45cm 2 3 2.5y 4/6 4 Loamy sand 5 no stones 6 Damp 7 dry no structure 8 very loose	UXO; rad (α) 0.1 cps rad (β) 5-6 cps rad (γ) < 0.1 µ Sv/h NB: lens of mouldable loamy sand (clay) at about 30-32cm
99	√	TM 647426 263823	0	No slope no aspect	Young plantation woodland. Mainly white poplar ~4-5m high. Grass understorey	1 0-20cm 2 Diffuse, regular 3 2.5y 5/6 4 Loamy sand, lots of roots 5 No stones 6 Damp 7 Poor medium granular str 8 Loose, friable	1 20->78cm 2 Diffuse 3 2.5y 5/6 with paler mottles (2.5y 7/6) 4 Sand 5 <1% stones 6 Moist 7 none 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO; rad (α) 0.06 cps rad (β) 5.6 cps rad (γ) 0.1 µ Sv/h dose rate
100	√	TM 647516 263811	0	No slope no aspect	On east fenceline just south of TP58. Young Corsican pine ~ 3-4m tall with sparse British native broadleaves to 1m. Grass understorey	1 0-40cm 2 Diffuse, regular 3 2.5y 6/4 4 Loamy sand 5 5% stones 6 Damp 7 No structure 8 loose, not cohesive	1 >40cm 2 3 2.5y 6/4 4 Sand 5 30-40% stones (prevented digging any further down) 6 damp 7 No structure 8 loose, not cohesive	1 2 3 4 5 6 7 8	UXO; rad (α) 0.06 cps rad (β) 5.6 cps rad (γ) <0.05 dose rate
101	√	TM 647502 263916	0	No slope no aspect	Young Corsican pine ~ 3-4m tall with sparse British native broadleaves to 1m. Grass understorey	1 Unable to dig further than 15cm - rocks and stones 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	UXO; rad (α) rad (β) rad (γ)
102	√	TM 647413 263912	<1	No slope no aspect	Young Corsican pine ~ 3-4m tall with sparse British native broadleaves to 1m. Grass understorey	1 0-42cm 2 Very diffuse boundary 3 2.5y 6/4 4 Loamy sand - lots of tree root 5 No stones 6 Damp/moist 7 Poor medium granular 8 loose, not cohesive	1 42-78cm 2 diffuse 3 2.5y 6/4 (ochre) 4 Shelly sand with sandy loam lenses 5 no stones 6 Damp 7 none 8 loose, not cohesive	1 >78cm 2 3 2.5y 6/4 (with paler patches of 2.5y 7/6) 4 Sand 5 no stones 6 Damp 7 none 8 loose, not cohesive	UXO; None detected rad (α) 0.2 cps rad (β) 4.7 cps rad (γ) <0.1 dose rate

103	√	TM 647414 263961	<1	No slope no aspect	Young Corsican pine ~ 3-4m tall with sparse British native broadleaves to 1m. Grass understorey	1 0-22cm 2 Diffuse, regular 3 2.5y 5/4 4 Loamy sand 5 <2% stones 6 damp 7 Very poor medium granul 8 loose, not cohesive	1 >22cm 2 3 2.5y 6/4 4 Shelly sand 5 <2% stones 6 damp 7 No structure 8 loose, gritty	1 2 3 4 5 6 7 8	UXO; rad (α) 0.05 rad (β) 4.8 rad (γ) <0.1
104	√	TM 647525 264083	~20	90	Eastern bund 10m high. Rough grass with gorse	1 0-14cm 2 Sharp, irregular 3 2.5y 3/3 4 loamy sand with high organic matter + dense root mat 5 No stones 6 Damp 7 Good fine granular structu 8 loose, not cohesive	1 14-65cm 2 Diffuse 3 2.5y 5/6 4 Loamy sand 5 <1% stones 6 Damp 7 no structure 8 loose, not cohesive	1 >65cm 2 3 2.5y 5/6 4 Sand 5 >20% stones + sandy 6 Damp 7 non structure 8 very loose	UXO; rad (α) 0.06 cps rad (β) 4 cps rad (γ) No dose rate
105	√	TM 647540 263951	~ 15-20	90	Eastern inner bund. Rough grassland + gorse	1 0-13cm 2 Sharp, irregular 3 2.5y 3/3 (black) 4 High in organic matter, loamy sand 5 No stones 6 Damp 7 Poor medium granular structure with dense roots mat 8 loose, not cohesive	1 13-35cm 2 Diffuse 3 2.5y 5/6 4 Loamy sand 5 No stones 6 Damp 7 No structure 8 loose, not cohesive	1 35->80cm 2 3 2.5y 7/4 4 Coarse sand 5 No stones 6 Damp 7 No structure 8 loose, not cohesive	UXO; rad (α) 0.1 cps rad (β) 3.5 cps rad (γ) 0.05 dose rate
106	√	TM 647593 263963	0	No slope no aspect	Grassland, area of dune slack between the outer inner bund	1 0 - 7 / 8cm 2 very diffuse, regular 3 2.5y 3/3 4 Loamy sand 5 No stones 6 Moist 7 no structure 8 very loose, not cohesive	1 7 / 8 - >80cm 2 3 2.5y 5/6 4 Sand with shell fragments 5 no stones 6 damp 7 no structure 8 very loose, not cohesive	1 2 3 4 5 6 7 8	UXO; rad (α) rad (β) rad (γ) No RAD readings taken; no hand texturing undertaken.. NB: Grassland area between two bunds
107	√	TM 647600 264086	0 (on top of sand dune)	No slope no aspect	Outer bund (sand dune) Coastal grassland + marram grass	1 0 - 6 / 9cm 2 Sharp, irregular 3 2.5y 3/3 4 Sand high in organic matter 5 No stones 6 damp 7 No structure 8 very loose, not cohesive	1 >9cm 2 3 2.5y 7/4 (yellow) 4 Coarse sand with shelly fragments 5 No stones 6 Moist 7 No structure 8 very loose, not cohesive	1 2 3 4 5 6 7 8	UXO; rad (α) rad (β) rad (γ) No RAD readings - no hand texturing
108	√	TM 647587 264250	- flat	No slope no aspect	Dune slack in between inner + outer bund. Grassland	1 0-14cm 2 Sharp, irregular 3 2.5y 3/3 4 Sand high in organic matter 5 <2% stone (less than 1cm) 6 Dense, root mass at surface 7 No structure 8 very loose, not cohesive	1 >14cm 2 3 4 Beach pebbles with coarse sand 5 60-7% stones (1-2 cm diameter) 6 Moist/wet 7 No structure 8 very loose, not cohesive	1 2 3 4 5 6 7 8	UXO; rad (α) rad (β) rad (γ)
109	√	TM 647527 264247	15	270	Inner bund grassland with hawthorn, pine, gorse, very exposed (all young saplings)	1 0-9cm 2 Sharp + irregular 3 2.5y 3/3 4 Loamy sand, high organic matter, dense root mat 5 No stones 6 Damp 7 Moderately good medium granular structure 8 very loose, not cohesive	1 9 - >89cm 2 3 2.5y 6/4 4 Sand with shell fragments 5 No stones 6 Wet 7 no structure 8 very loose, not cohesive	1 2 3 4 5 6 7 8	UXO; rad (α) 0.1 cps rad (β) 4.2cps rad (γ) approx 0.05 (dose rate)

110	√	TM 647550 264450	3-4	45	NE corner of 10m bund, young Corsican pine (2-3) with oak, and broom understorey. To 1m, grassy understorey	1 0-22cm 2 Sharp, regular boundary 3 2.5y 4/4 4 Loamy sand, lots of organic root matter 5 6 Damp 7 Good medium granular st 8 loose, not cohesive	1 22 - >70cm 2 3 2.5y 6/4 4 Loamy sand with few shelly fragments 5 Generally no stones. Stony layer at 50-68cm (>10% stones) 6 Damp 7 no structure 8 loose, not cohesive	1 2 3 4 5 6 7 8	UXO; rad (α) 0 cps rad (β) 4.6 cps rad (γ) 0-0.5 (dose rate)
111	√	TM 647469 264435	3-4	320	As previous (see 110). On top of bund S of Size B. grassy understorey	1 0-9cm 2 Diffuse 3 2.5y 5/3 4 Loamy sand 5 No stones 6 Damp 7 Moderate-fine granular structure 8 Dense root mat	1 9 - >68cm 2 3 2.5y 6/4 4 Sand with shell fragments 5 No stones 6 Damp 7 No structure 8 Loose	1 2 3 4 5 6 7 8	UXO; rad (α) rad (β) rad (γ) No RAD
112	√	TM 647369 264414	0	No slope no aspect	On top of bund (north of field 2). Young mixed plantation woodland	1 0-8cm 2 Diffuse 3 2.5y 5/3 4 Loamy sand, small amount of organic matter + dense root mat 5 5% stones 6 Damp 7 Moderately good medium granular structure 8 loose, not cohesive	1 8 - >40cm 2 3 2.5y 6/4 4 Loamy sand 5 10-15% stones 6 Damp 7 Loose 8 loose, not cohesive	1 2 3 4 5 6 7 8	UXO; rad (α) rad (β) rad (γ) No RAD
113	√	TM 647274 264333	0	No slope no aspect	Top of field 1, SI grassland dominated by Cocksfoot.	1 0-9cm 2 Diffuse regular 3 2.5y 5/3 4 Dense root mat 5 No stones 6 Damp 7 Poor crumb structure 8 Soft ball cohesion	1 9 - >56cm 2 3 2.5y 6/4 4 Sand with shell fragments 5 Few stones >2% 6 Damp 7 no structure 8 Loose (not cohesive)	1 2 3 4 5 6 7 8	UXO; rad (α) 0.2 cps rad (β) 4.1 cps rad (γ) 0-0.05 (dose rate)
114	√	TM 647327 264440	0	No slope no aspect	Between bund and SSSI boundary - within small broadleaf copse - wet. - Phragmites present + lots of leaf litter. Mainly willow, also hazel.	1 0-4cm 2 Diffuse, regular 3 2.5y 3/3 4 Loamy sand with much O 5 No stones 6 very wet (saturated) 7 no structure 8 wet and sloppy	1 4 - >55cm 2 3 2.5y 6/4 with mottles 5y 5/6 4 Loamy sand 5 ~10% stones - large stones 6 saturated 7 no structure 8 wet and sloppy	1 2 3 4 5 6 7 8	UXO; rad (α) 0.06 cps rad (β) 3.5 cps rad (γ) 0 dose rate
115	√	TM 647348 264494	0	No slope no aspect	SSSI adjacent to 2nd ditch. Mixture of Phragmites + bracken. Black surface litter horizon.	1 0-41cm 2 Sharp, regular 3 2.5Y 3/1 brownish black with 2.5Y 5/6 mottles and roots. 4 Well humified dense and dark coloured peat with a few sand particles. Dense peat with Cladium/root remains. 5 no stones 6 relatively dry 7 breaks into dry clods with fibrous lenses 8 dense peat	1 >41cm 2 Sharp, regular 3 2.5 Y 5/2 with 2.5Y5/6 reddish mottles and roots 4 dense clay; grey with orange mottles 5 no stones 6 damp 7 no structure 8 very stiff, very sticky and mouldable	1 2 3 4 5 6 7 8	UXO; rad (α) rad (β) rad (γ)
116	√	TM 647295 264452	0	No slope no aspect	Phragmites under Silver birch + willow (Height 5m). Grassy understorey	1 0-16cm 2 sharp, regular 3 2.5Y 3/1 dark black peat 4 Humified peat. Very few identifiable vegetation fragments. 5 no stones 6 very wet 7 wet peat 8 soft, smooth and mouldable peat	1 16-33cm 2 sharp, regular 3 10Y 4/2 dark grey with no mottles 4 very soft mouldable clay 5 no stones 6 wet no structure 7 slightly stiff and cohesive	1 >33cm 2 3 10 YR 2/2 bright brown 4 fibrous peat 5 no stones 6 dry no structure 7 dry peat 8 dry and breaking into blocks	UXO; rad (α) rad (β) rad (γ)
117	√	TM 647241 264405	0	No slope no aspect	Phragmites under willow (lots of deer tracks)	1 Deep peat to >110cm 2 Dark humic peat to 40cm 3 2.5YR 3/2 4 Dark brown/black humic peat. Paler fibrous peat below 30cm (10YR 4/3) 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	UXO; rad (α) rad (β) rad (γ) smell of H_2S

SIZEWELL AGRICULTURAL LAND CLASSIFICATION RECORD SHEET

Location: Pillbox Field	Date: 4.11.10	Surveyor(s): SR,SH,RE	Weather: Fair/windy	Page No: 1

Criteria: 1 depth, 2 boundary, 3 colour + mottles, 4 texture, 5 stoniness, 6 moisture status, 7 structure, 8 consistency (erosion)

Auger No	POWRA	GPS (8)	Slope (deg)	Aspect (deg)	Land Use/ surface vegetation	Horizon 1	Horizon 2	Horizon 3	Comments (inc UXO/rad)
120	√	TM 647072 62870	3-4° slope, leading to 10-12° slope	North East	Pillbox field north, stony recently abandoned adjacent field with tall dead ragwort and other sparse weeds	1 0-32cm 2 Diffuse, irregular 3 2.5y 5/3 mid-brown 4 Loamy sand 5 5-10% stones 6 dry and friable 7 Very poor medium to fine granular structure 8 Loose, not cohesive	1 32-48cm 2 Diffuse, regular 3 2.5y 6/4 4 Loamy sand 5 5-10% stones 6 damp 7 none 8 Loose, not cohesive	1 48-68cm 2 Diffuse 3 2.5y 5/6 4 Sandy loam 5 none 6 damp 7 none 8 Slightly cohesive	UXO rad (α) 0 rad (β) 4.5 rad (γ) 0.05 Horizon 4 - >68cm, soft sand 5y 6/8
121	√	TM 647125 62888	1-2	ENE	As above with grassy surface	1 0-50cm 2 Diffuse, irregular 3 2.5y 5/3 mid-brown 4 Loamy sand 5 2-4% stones. 0-38cm higher stone content (5%) 6 damp 7 No structure 8 Loose, not cohesive	1 50-87cm 2 Diffuse 3 5y 6/8 4 Soft pale sand 5 <3% 6 damp 7 No structure 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) 0.06 rad (β) 4.3 rad (γ) <0.1
122	√	TM 47156 62773	1	E	As above	1 0-38cm 2 Diffuse. irregular 3 2.5y 5/3 mid-brown 4 Loamy sand 5 >2% stones 6 Damp 7 Very poor medium to fine granular structure 8 Loose, not cohesive	1 38->100cm 2 3 2.5y 6/4 ochre sand 4 Sand 5 No stones 6 Damp 7 No structure 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) 0.13 rad (β) 4.5 rad (γ) 0
123	√	TM 47254 62782	1-2	SE	As above	1 0-51 2 Very diffuse + regular 3 2.5y 5/3 mid-brown 4 Loamy sand 5 No stones 6 Damp 7 No structure 8 Loose, not cohesive	1 51->98 2 3 2.5y 6/4 ochre sand 4 loamy sand 5 No stones 6 Damp 7 No structure 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) 0.06 rad (β) 5.4 rad (γ) 0 - 0.05
124	√	TM 47157 62647	0	0	Lower southern end of pillbox outside Heras fencing	1 0-82 2 Sharp, regular 3 2.5y 5/3 mid-brown 4 loamy sand 5 No stones 6 damp to wet 7 Surface - poor medium to fine granular structure 8 Loose, not cohesive	1 82->110cm 2 Diffuse, regular 3 Black sand 4 Loamy sand 5 No stones 6 very wet 7 No structure 8 Loose, not cohesive. wet - even "sloppy"	1 2 3 4 5 6 7 8	UXO rad (α) 0.1 rad (β) 5.3 rad (γ) 0.0 Deep surface dark brown organic (wet) horizon)
125	√	TM 47115 62724	40793	S	Just south of Pillbox on slope. Stony, recently abandoned adjacent field with tall dead ragwort and other sparse	1 0-48cm 2 diffuse and irregular 3 2.5y 5/3 mid-brown 4 loamy and 5 ~5% stones 6 damp 7 Moderately good medium gra 8 Loose, not cohesive	1 48->100 2 3 2.5y 4/6 reddish brown 4 loamy sand 5 No stones 6 damp 7 Loose - no structure 8 Loose, not cohesive	1 2 3 4 5 6 7 8	UXO rad (α) 0.1 rad (β) 4.6 rad (γ) 0

Appendix B Description of ALC Grades

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

Grade 1 - excellent quality agricultural land
Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 - very good quality agricultural land
Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Grade 3 - good to moderate quality agricultural land
Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

> **Subgrade 3a - good quality agricultural land**
> Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.
>
> **Subgrade 3b - moderate quality agricultural land**
> Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4 - poor quality agricultural land
Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be

moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 - very poor quality agricultural land
Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Appendix C Description of Soil Wetness Classes

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six revised soil wetness classes (Hodgson, in preparation) are identified and are defined below.

Wetness Class	Definition of Soil Wetness Classes (including duration of waterlogging[1])
I	The soil profile is not wet within 70cm depth for more than 30 days in most years[2].
II	The soil profile is wet within 70cm depth for 31-90 days in most years *or,* if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 90 days, but not wet within 40cm depth for more than 30 days in most years.
III	The soil profile is wet within 70cm depth for 91-180 days in most years *or,* if there is no slowly permeable layer within 80cm depth, it is wet within 70cm for more than 180 days, but only wet within 40cm depth for between 31 and 90 days in most years.
IV	The soil profile is wet within 70cm depth for more than 180 days but not within 40cm depth for more than 210 days in most years *or,* if there is no slowly permeable layer within 80cm depth, it is wet within 40 cm depth for 91-210 days in most years.
V	The soil profile is wet within 40cm depth for 211- 335 days in most years.
VI	The soil profile is wet within 40cm depth for more than 335 days in most years.

[1]The number of days specified is not necessarily a continuous period.

[2] 'In most years' is defined as more than 10 out of 20 years.

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

Appendix D Example Soil Profile Descriptions

1. Newchurch 4 Soil Association. Lower Abbey Farm

Horizon	Depth	Site Description	Profile Description
Ap	0-38/40cm	NGR: TM 46032 65641 Land use: Wheat stubble with 80% bare soil surface; surface soil erosion potential in places; Slope: 1.2° – 4.2° Aspect: E to ESE	Boundary: diffuse/irregular Colour: 2.5 Y 5/6 (yellowish grey) Texture: loamy sand Stoniness: stoneless Structure: medium sub-angular blocky Soil moisture: Damp Consistency: loose, gritty, no cohesion
B1	40cm->70cm		Boundary: diffuse/irregular Colour: 2.5 Y 5/4 (yellowish grey) Texture: loamy sand Stoniness: 2-5% Structure: poor medium angular blocky Soil moisture: Damp Consistency: loose, gritty, no cohesion, sandy

2. Newchurch 4 Soil Association. Upper Abbey Farm

Horizon	Depth	Site Description	Profile Description
Ap	0-36/46 cm	NGR: TM 45575 64692 Land use: Wheat stubble with 80% bare soil surface. Slopes: zero – 2/3° Aspect: zero to NE	Boundary: diffuse/irregular Colour: 2.5 Y 5/3 Texture: loamy sand Stoniness: stoneless Structure: medium subangular blocky Soil moisture: Damp Consistency: loose, sandy, not cohesive
B1	36-80cm		Boundary: diffuse/irregular Colour: 2.5 Y 6/4 Texture: loamy sand Stoniness: stoneless Structure: medium angular blocky Soil moisture: Damp Consistency: loose, gritty, not cohesive
B2	>80cm		Colour: 2.5 Y 6/4 Texture: sandy loam Stoniness: stoneless Structure: medium angular blocky Soil moisture: Moist Consistency: cohesive ball, stiff

3. Newchurch 4 Soil Association. Kenton Hills

Horizon	Depth	Site Description	Profile Description
L, F, H	0-9cm	NGR: TM 46010 64321 Forestry: Coniferous (*Pinus nigra*) plantation height 20m. Bracken understorey. Surface moss with <10% bare soil surface; Slope: 1.2º – 4.2º Aspect: E to ESE	Dark brown/black needle litter. Fermentation layer orange-brown with very little humic horizon. Sharp boundary to:
A1	13-16cm		Boundary: sharp and regular Colour: 2.5 Y 4/2 (yellowish grey) pale grey leached with organic matter throughout. Texture: sandy loam Stoniness: stoneless Structure: no clear structure Soil moisture: Damp Consistency: loose, gritty, no cohesion
A2	16-23cm		Boundary: sharp/irregular Colour: 2.5 Y 4/6 (yellowish grey) Pale grey leached. Texture: sandy loam Stoniness: No stones Structure: no clear structure Soil moisture: Damp Consistency: loose, gritty, no cohesion
B1	23-33cm		Boundary: diffues/regular Colour: 2.5 Y 6/4 (yellowish grey/ochre) Texture: sandy loam Stoniness: No stones Structure: poor medium angular blocky Soil moisture: Damp Consistency: loose, gritty, no cohesion
B2	>33cm		Boundary: diffuse/regular Colour: 2.5 Y 6/3 Texture: loamy sand Stoniness: No stones Structure: no clear structure Soil moisture: Damp Consistency: loose, gritty, no cohesion

4. Sandwich Soil Association. Lower Abbey Farm

Horizon	Depth	Site Description	Profile Description
A	0-6/9cm	NGR: TM 47622 64124 Sand dune/bund with coastal grassland and marram grass. ~10% base sand surface Slope: 0 (top of dune/bund) Aspect: N/A	Boundary: sharp/irregular Colour: 2.5 Y 7/5 (yellowish grey) Texture: sand (high in organic matter) Stoniness: stoneless Structure: no structure Soil moisture: Damp Consistency: loose, no cohesion
B	>9cm		Boundary: sharp/irregular Colour: 2.5 Y 7/4 (yellow) Texture: coarse sand with shelly fragments Stoniness: no stones Structure: no structure Soil moisture: Damp Consistency: loose, no cohesion, sandy

5. Mendham Soil Association. Sizewell Marshes SSSI

Horizon	Depth	Site Description	Profile Description
Peat 1	0-16	NGR: TM 647348 264494 2m tall reed (*Phragmites spp)* under Silver birch (*Betula pendula*)and willow (*Salix* spp) (height 5m). Grassy understorey. Slope: 0 Aspect: N/A	Boundary: sharp/irregular Colour: 2.5Y 3/1 dark black peat Texture: Humified peat, very few identifiable vegetation fragments Stoniness: stoneless Structure: more humified than fibrous Soil moisture: Very wet Consistency: soft, smooth and mouldable
Clay	16-33cm		Boundary: sharp/irregular Colour: 10Y 4/2 dark grey with no mottles Texture: very soft mouldable clay Stoniness: no stones Structure: no structure Soil moisture: Wet Consistency: slightly stiff and cohesive
Peat 2	>33cm		Boundary: sharp/irregular Colour: 10 YR 2/2 bright brown Texture: Fibrous peat Stoniness: stoneless Structure: Fibrous Soil moisture: Very wet Consistency: dry and breaking into blocks

Appendix E Soil Moisture Balance Calculations

SIZEWELL SOIL MOISTURE BALANCE CALCULATIONS

Location		Depth (cm)	Texture	Stoniness (%)	Structure	AP calc*	AP	MBw (AP-MD)w	MBp (AP-MD)p	ALC Grade
Lower Abbey East	Topsoil	37	LS	2	poor	399.6				
	Subsoil	35	LS	2	poor	377.65				
							77.725	-47.275	-45.275	3b
Lower Abbey West	Topsoil	37	LS	2	poor	399.6				
	Subsoil	35	LS	2	poor	377.65				
							77.725	-47.275	-45.275	3b
Lower Abbey South	Topsoil	39	LS	2	moderate	574.08				
	Subsoil	37	LS	3	poor	395.345				
							96.943	-28.0575	-26.0575	3b
Sizewell South	Topsoil	39	LS	2	moderate	574.08				
	Subsoil	40	LS	3	poor	427.4				
							100.15	-24.852	-22.852	3b
Sizewell South	Topsoil	38	LS	5	poor	399				
	Subsoil	40	LS	2	poor	431.6				
							83.06	-41.94	-39.94	3b
Upper Abbey Farm (Northern 3 fields)	Topsoil	45	LS	0	poor	495				
	Subsoil	25	LS	2	poor	269.75				
							76.475	-48.525	-46.525	3b
Eastern-most sand dunes	Topsoil	10	S	0	poor	70				
	Subsoil	50	S	0	poor	250				
							32	-93	-91	4
Bund E	Topsoil	14	S	0	poor	126				
	Subsoil	50	S	0	poor	250				
							37.6	-87.4	-85.4	4
Bund N	Topsoil	15	S	5	good	171.75				
	Subsoil	50	S	5	poor	381.25				
							55.3	-69.7	-67.7	4
Greater Gabbard	Topsoil	45	LS	3	poor	394.2				
	Subsoil	50	S	3	poor	340.25				
							73.445	-51.555	-49.555	4
Fields 2, 3	Topsoil	10	S	0	poor	90				
	Subsoil	30	S	0	poor	450				
							54	-71	-69	4
Fields 1,	Topsoil	5		0	poor	45				
	Subsoil	50		0	poor	450				
							49.5	-75.5	-73.5	4

* calculation based on MAFF (1988) (Ref 2) Appendix 4, using soil horizon characteristics averaged across a number of fields in each geographical part of teh stury area.

Key:

Ap	Profile-available water (%)
MBw	Moisture Balance (for wheat)
MBp	Moisture Balance (for potatoes)

Appendix F Photographic Appendix

ALC Field Survey Photographs

Newchurch 4 sandy loam; ALC Grade 3b land south of Lower Abbey Farm

Netting-mulched parsnips; Newchurch 4 sandy loam; ALC Grade 3b land south of Lower Abbey Farm

Newchurch 4 sandy loam under *Pinus negra*, Kenton Hills.

Forest soil version of Newchurch 4 sandy loam with OM and needle litter horizons.

Winter wheat crop south east of Ash Wood Cottages on Newchurch 4 sandy loam. ALC Grade 3b.

Coastal dunes and dune slacks on Sandwich sandy soils. Grade 4 ALC land.

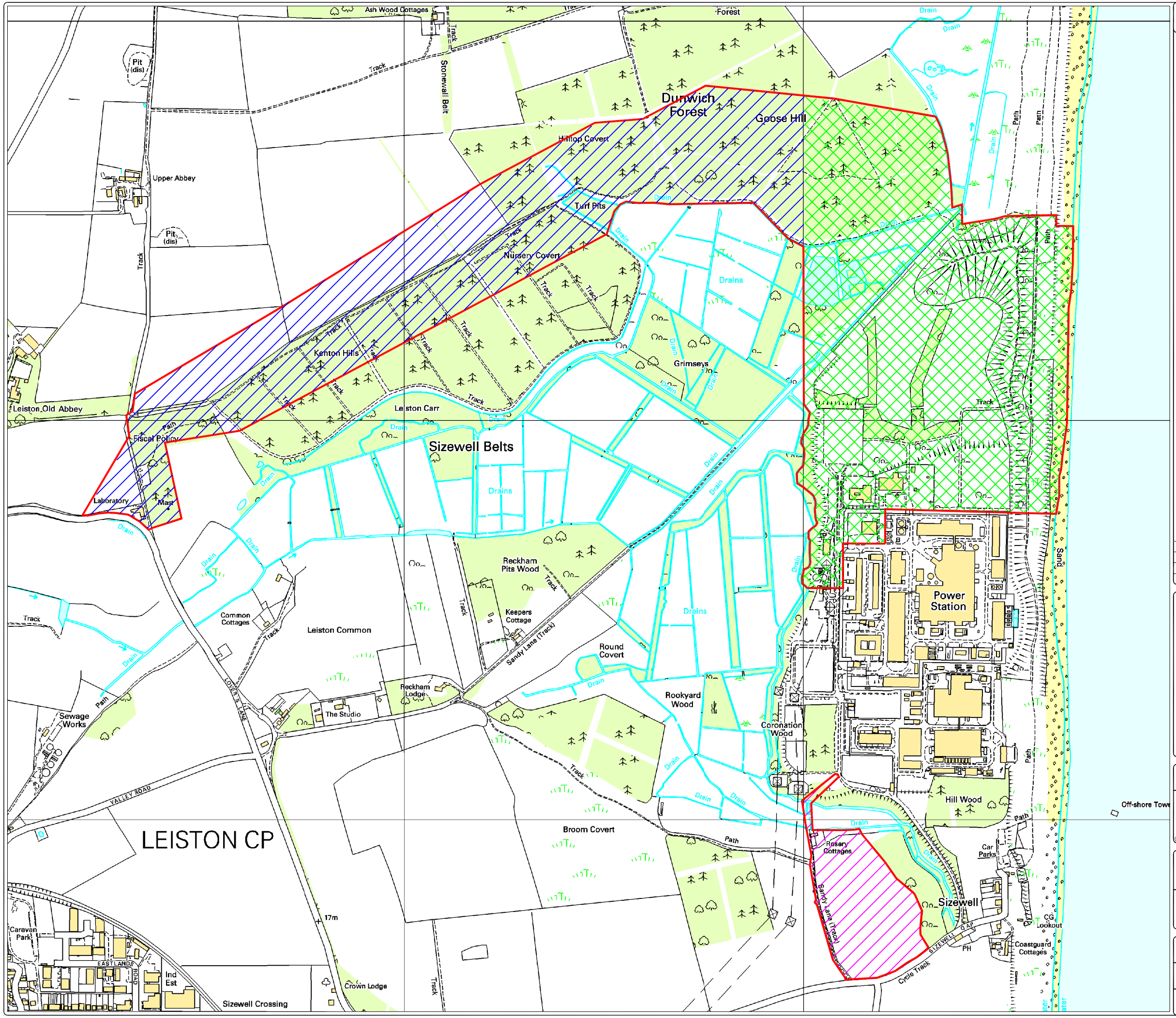
Sizewell Marshes SSSI on wet Mendham peaty soils

Sizewell C development area northern part of Field 3.

Young mixed woodland on platform north of Sizewell B power station

Pillbox field on Newchurch 4 stony sandy loam. ALC Grade 4 land.

Appendix G Generic Study Area for Proposed Sizewell C Development



FOR DISCUSSION

Legend

- Srategic Siting Assessnt Boundary (Study Areas as defined by EDF)
- Zone North (ZN)
- Zone Central (ZC)
- Zone South (ZS)

Rev	Date	Description	By	Des
2	28.09.09	Issue 03 for Comment	CLD	CLD
1	18.09.09	Issue 02 for Comment	CLD	CLD
0	14.09.09	Issue 01 for Comment	CLD	CLD

Overview

N W E S

Scale (m) 0 125 250

Client: EDF

amec

Project: Desk Based Assessment of Sizewell EPR Site

Title: Plan Showing the Strategic Siting Assessment Boundary (Study Area) and Divised Areas

Drawn	Checked	Approved
CLD	TJS	CE
Date: October 2009		Sheet size: A3
Drawing Number: 5788001914/FIG2	Rev: Rev 2	Scale: See scale bar

Appendix B:
Natural England
Technical Information Note 049 – Agricultural Land Classification

Natural England Technical Information Note TIN049

Agricultural Land Classification: protecting the best and most versatile agricultural land

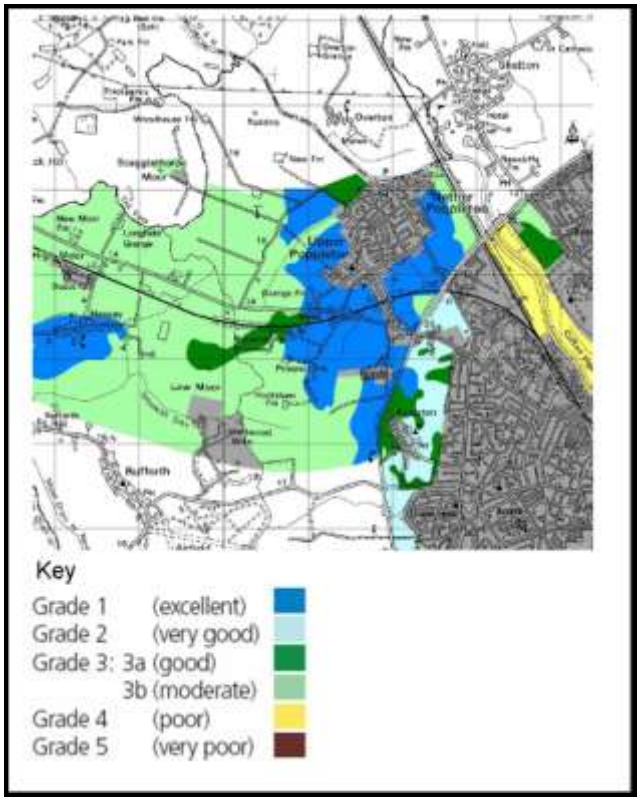
Most of our land area is in agricultural use. How this important natural resource is used is vital to sustainable development. This includes taking the right decisions about protecting it from inappropriate development.

Policy to protect agricultural land

Government policy for England is set out in the National Planning Policy Framework (NPPF) published in March 2012 (paragraph 112). Decisions rest with the relevant planning authorities who should take into account the economic and other benefits of the best and most versatile agricultural land. Where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of higher quality. The Government has also re-affirmed the importance of protecting our soils and the services they provide in the Natural Environment White Paper The Natural Choice:securing the value of nature (June 2011), including the protection of best and most versatile agricultural land (paragraph 2.35).

The ALC system: purpose & uses

Land quality varies from place to place. 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. It helps underpin the principles of sustainable development.



Agricultural Land Classification - map and key

Second edition 19 December 2012
www.naturalengland.org.uk

The ALC system classifies land into five grades, with Grade 3 subdivided into Subgrades 3a and 3b. The best and most versatile land is defined as Grades 1, 2 and 3a by policy guidance (see Annex 2 of NPPF). This is the land which is most flexible, productive and efficient in response to inputs and which can best deliver future crops for food and non food uses such as biomass, fibres and pharmaceuticals. Current estimates are that Grades 1 and 2 together form about 21% of all farmland in England; Subgrade 3a also covers about 21%.

The ALC system is used by Natural England and others to give advice to planning authorities, developers and the public if development is proposed on agricultural land or other greenfield sites that could potentially grow crops. The Town and Country Planning (Development Management Procedure) (England) Order 2010 (as amended) refers to the best and most versatile land policy in requiring statutory consultations with Natural England. Natural England is also responsible for Minerals and Waste Consultations where reclamation to agriculture is proposed under Schedule 5 of the Town and Country Planning Act 1990 (as amended). The ALC grading system is also used by commercial consultants to advise clients on land uses and planning issues.

Criteria and guidelines

The Classification is based on the long term physical limitations of land for agricultural use. Factors affecting the grade are climate, site and soil characteristics, and the important interactions between them. Detailed guidance for classifying land can be found in: *Agricultural Land Classification of England and Wales: revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988):

- **Climate:** temperature and rainfall, aspect, exposure and frost risk.
- **Site:** gradient, micro-relief and flood risk.
- **Soil:** texture, structure, depth and stoniness, chemical properties which cannot be corrected.

The combination of climate and soil factors determines soil wetness and droughtiness. Wetness and droughtiness influence the choice of crops grown and the level and consistency of yields, as well as use of land for grazing livestock. The Classification is concerned with the inherent potential of land under a range of farming systems. The current agricultural use, or intensity of use, does not affect the ALC grade.

Versatility and yield

The physical limitations of land have four main effects on the way land is farmed. These are:

- the range of crops which can be grown;
- the level of yield;
- the consistency of yield; and
- the cost of obtaining the crop.

The ALC gives a high grading to land which allows more flexibility in the range of crops that can be grown (its 'versatility') and which requires lower inputs, but also takes into account ability to produce consistently high yields of a narrower range of crops.

Availability of ALC information

After the introduction of the ALC system in 1966 the whole of England and Wales was mapped from reconnaissance field surveys, to provide general strategic guidance on land quality for planners. This Provisional Series of maps was published on an Ordnance Survey base at a scale of One Inch to One Mile in the period 1967 to 1974. These maps are not sufficiently accurate for use in assessment of individual fields or development sites, and should not be used other than as general guidance. They show only five grades: their preparation preceded the subdivision of Grade 3 and the refinement of criteria, which occurred after 1976. They have not been updated and are out of print. A 1:250 000 scale map series based on the same information is available. These are more appropriate for the strategic use originally intended and can be downloaded from the Natural England **website**. This data is also available on ‘Magic’, an interactive, geographical information website **http://magic.defra.gov.uk/**.

Since 1976, selected areas have been re-surveyed in greater detail and to revised

guidelines and criteria. Information based on detailed ALC field surveys in accordance with current guidelines (MAFF, 1988) is the most definitive source. Data from the former Ministry of Agriculture, Fisheries and Food (MAFF) archive of more detailed ALC survey information (from 1988) is also available on **http://magic.defra.gov.uk/**. Revisions to the ALC guidelines and criteria have been limited and kept to the original principles, but some assessments made prior to the most recent revision in 1988 need to be checked against current criteria. More recently, strategic scale maps showing the likely occurrence of best and most versatile land have been prepared. Mapped information of all types is available from Natural England (see *Further information* below).

New field survey

Digital mapping and geographical information systems have been introduced to facilitate the provision of up-to-date information. ALC surveys are undertaken, according to the published Guidelines, by field surveyors using handheld augers to examine soils to a depth of 1.2 metres, at a frequency of one boring per hectare for a detailed assessment. This is usually supplemented by digging occasional small pits (usually by hand) to inspect the soil profile. Information obtained by these methods is combined with climatic and other data to produce an ALC map and report. ALC maps are normally produced on an Ordnance Survey base at varying scales from 1:10,000 for detailed work to 1:50 000 for reconnaissance survey

There is no comprehensive programme to survey all areas in detail. Private consultants may survey land where it is under consideration for development, especially around the edge of towns, to allow comparisons between areas and to inform environmental assessments. ALC field surveys are usually time consuming and should be initiated well in advance of planning decisions. Planning authorities should ensure that sufficient detailed site specific ALC survey data is available to inform decision making.

Consultations

Natural England is consulted by planning authorities on the preparation of all development plans as part of its remit for the natural environment. For planning applications, specific consultations with Natural England are required under the Development Management Procedure Order in relation to best and most versatile agricultural land. These are for non agricultural development proposals that are not consistent with an adopted local plan and involve the loss of twenty hectares or more of the best and most versatile land. The land protection policy is relevant to all planning applications, including those on smaller areas, but it is for the planning authority to decide how significant the agricultural land issues are, and the need for field information. The planning authority may contact Natural England if it needs technical information or advice.

Consultations with Natural England are required on all applications for mineral working or waste disposal if the proposed afteruse is for agriculture or where the loss of best and most versatile agricultural land agricultural land will be 20 ha or more. Non-agricultural afteruse, for example for nature conservation or amenity, can be acceptable even on better quality land if soil resources are conserved and the long term potential of best and most versatile land is safeguarded by careful land restoration and aftercare.

Other factors

The ALC is a basis for assessing how development proposals affect agricultural land within the planning system, but it is not the sole consideration. Planning authorities are guided by the National Planning Policy Framework to protect and enhance soils more widely. This could include, for example, conserving soil resources during mineral working or construction, not granting permission for peat extraction from new or extended mineral sites, or preventing soil from being adversely affected by pollution. For information on the application of ALC in Wales, please see below.

Further information

Details of the system of grading can be found in: *Agricultural Land Classification of England and Wales: revised guidelines and criteria for grading the quality of agricultural land* (MAFF, 1988).

Please note that planning authorities should send all planning related consultations and enquiries to Natural England by e-mail to **consultations@naturalengland.org.uk**. If it is not possible to consult us electronically then consultations should be sent to the following postal address:

Natural England
Consultation Service
Hornbeam House
Electra Way
Crewe Business Park
CREWE
Cheshire
CW1 6GJ

ALC information for Wales is held by Welsh Government. Detailed information and advice is available on request from Ian Rugg (**ian.rugg@wales.gsi.gov.uk**) or David Martyn (**david.martyn@wales.gsi.gov.uk**). If it is not possible to consult us electronically then consultations should be sent to the following postal address:

Welsh Government
Rhodfa Padarn
Llanbadarn Fawr
Aberystwyth
Ceredigion
SY23 3UR

Natural England publications are available to download from the Natural England website: **www.naturalengland.org.uk**.

For further information contact the Natural England Enquiry Service on 0300 060 0863 or e-mail **enquiries@naturalengland.org.uk**.

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Appendix C:
IPSS Professional Competency Scheme Doc. 2 – Agricultural Land Classification

DOCUMENT 2

Agricultural Land Classification (England and Wales)

Background

The evaluation of land for its agricultural potential in England and Wales[1] is accomplished by application of the Agricultural Land Classification[2] (ALC). Professional competence in Agricultural Land Classification builds upon foundation skills in field soil investigation, description and interpretation (IPSS PCSS Document 1). This system of professional competence is based upon a detailed written procedures document developed by the Farming and Rural Conservation Agency[3].

Qualifications

Professional soil scientists with competence in Agricultural Land Classification will have graduated in a relevant science subject. They will also have a number of years of relevant field experience and will have, or be adequately qualified for, membership of a relevant professional body such as the Institute of Professional Soil Scientists.

Minimum competencies

Skills and Knowledge:

These are described under a number of subheadings that relate to different tasks. A professionally competent contractor should have the skills and knowledge identified under the **General heading** and **all other headings that are relevant** to the tasks required.

General

1. A general knowledge and understanding of natural soil development and of world, European and national soil taxonomy
2. A detailed knowledge and understanding of the Agricultural Land Classification system relevant to the site and of the classification of land according to the current published Guidelines and other documents[1,2,] and the ability to apply it accurately and consistently in the classification of an area of land

[1] Similar systems are employed in Scotland and Northern Ireland

[2] ALC Revised Guidelines and Criteria for the Grading the Quality of Agricultural Land (MAFF, 1988) and Climatological Datasets for ALC (Met. Office, 1989)

[3] A former Executive Agency of the Ministry of Agriculture , Fisheries and Food (now Defra)

DOCUMENT 2

Agricultural Land classification (England and Wales)

Institute of Professional Soil Scientists

3. An awareness and knowledge of existing published and unpublished, paper-based and digital ALC information and sources
4. A knowledge of paper and digital topographic, geology and soil maps, mineral assessment reports and memoirs and other technical sources of reference; and of their role in ALC work
5. An understanding of map scales and of the Ordnance Survey National Grid
6. The ability to investigate, sample, describe and interpret soils in the field in a consistent manner and to professional standards (IPSS PCSS Document 1)
7. Knowledge of relevant European and national regulations and policies including national and local land use planning policy and guidance, and soil protection policy
8. The ability to effectively communicate soil information in a simple and relevant form to developers, planners and other relevant professionals with clear statements as to the reliability and certainty of the results
9. The ability to write accurate, concise reports in clear English and in line with best practice examples of ALC survey that communicate the relevant information to all relevant communicants
10. An awareness of the importance of systems of quality assurance and control in all aspects of professional work

Preparations prior to field survey

1. The ability to compile background site physical data (e.g. relief, geology, soils, climate, flood-risk, exposure and grade from published and unpublished sources) and understanding of the limitations of the data obtained
2. An understanding of scale and of how different survey sampling densities may impact on the certainty of results obtained. A knowledge of how to tailor survey density appropriately to the requirements of the client, and understanding of the limitations that might impose
3. The ability to compute gradients from map contours
4. A thorough knowledge of climatic data interpolation procedures (and any available associated bespoke computer software), and the ability to obtain representative site values
5. An understanding of soil maps, the concepts of soil associations and soil series and their limitations as a background to ALC grading
6. A knowledge of GPS and data logger technology and its uses and limitations for field survey work
7. A knowledge and understanding of relevant Health and Safety legislation requirements for work in the field
8. An understanding of basic biosecurity requirements and any animal or plant health restrictions which may be in force

Field survey for Agricultural Land Classification

1. The ability to determine, lay out and work to a relevant sampling strategy
2. Competency in the Foundation Skills (field soil investigation, sampling, description and interpretation) as per IPSS PCSS Document 1
3. The ability to accurately and consistently apply the ALC system to soil and other data collected during the field survey

Reporting

1. The knowledge and ability to compile an ALC map from background information and data collected during the field survey
2. The ability to write an ALC survey report according to an agreed format
3. Understanding of the principles of quality assurance and the ability to apply these as required by the client
4. The ability to convey the findings of the survey verbally such that they are understood by the client

SUPPORTING ORGANISATIONS

The following organisations have given their support to the Institute of Professional Soil Scientist's Working with Soils Professional Competency Initiative:

iPSS
Institute of Professional Soil Scientists

'Defra welcomes initiatives, such as the IPSS Working with Soils Competency Statements, that aim to improve the quality of professional soils advice'

ADAS

afbi Agri-Food and Biosciences Institute

AHDB Agriculture & Horticulture Development Board

AICC Association of Independent Crop Consultants

National Parks Britain's breathing spaces
Parciau Cenedlaethol Prydain
Ile i enaid gael llonydd
Pàircean Nàiseanta na h-Alba
Àiteachan anaiachadh bhreatainn

BALI British Association of Landscape Industries

BIAC

CEH Centre for Ecology & Hydrology
Natural Environment Research Council

CIWEM

The co-operative farms

CPRE Campaign to Protect Rural England
Standing up for your countryside

Cresswell
a Hyder Consulting group company

Earthcare Technical

Asiantaeth yr Amgylchedd Cymru
Environment Agency Wales

ENPAA English National Park Authorities Association

FWAG Farming & Wildlife Advisory Group

Comisiwn Coedwigaeth Cymru
Forestry Commission Wales

Game & Wildlife Conservation Trust

Greenvale AP
Natural choice for fresh potatoes

IAgrE

iema
Institute of Environmental Management & Assessment

The James Hutton Institute

Landscape Institute
Inspiring great places

Land Research Associates

defra
Department for Environment Food and Rural Affairs

SUPPORTING ORGANISATIONS

The following organisations have given their support to the Institute of Professional Soil Scientist's Working with Soils Professional Competency Initiative:

IPSS
Institute of Professional Soil Scientists

'Defra welcomes initiatives, such as the IPSS Working with Soils Competency Statements, that aim to improve the quality of professional soils advice'

LEAF – Linking Environment and Farming – Integrated Farm Management
NIAB TAG
NFU
National Trust
Natural England
Produce World – Growing Trust
Rothamsted Research
Royal Agricultural College
Royal Agricultural Society of England
SAC
Sainsbury's
Salmon & Trout Association
SEPA – Scottish Environment Protection Agency
Society of Biology
Soil Association
SNIFFER – Scotland & Northern Ireland Forum for Environmental Research
The Scottish Government
the Science council
The Wildlife Trusts
Tim O'Hare Associates – Soil & Landscape Consultancy
TOPSOIL – The Sustainable Choice from British Sugar
Unilever
Llywodraeth Cymru – Welsh Assembly Government
Waitrose
WRAP – Working together for a world without waste

Appendix D:
Soil Moisture Balance Calculations for Auger 3

Calculation of Crop-Adjusted Soil Available Water Capacity (AP) and Moisture Balances for Wheat

(re Appendix 4 and Page 26 of the ALC Guidelines, October 1988)

Project: Sizewell C (Main Site)
Auger/Pit Auger 3 (assuming loamy fine sand over fine sand)

Layer	Upper (cm)	Lower (cm)	Thickness (cm)	Texture Class	Structure Cond	TAv*	EAv*	Mineral (%)	Stones (%)
Topsoil	**0**	40	40	LFS	n/a	18	n/a	100	0
Subsoil 1 ≤ 50cm	40	40	0	LFS	Mod	15	n/a	100	0
Subsoil 2 ≤ 50cm	40	**50**	10	LFS	Mod	15	n/a	100	0
Subsoil 3 > 50cm	50	78	28	LFS	Mod	15	13	100	0
Subsoil 4 ≤ 120cm	78	**120**	42	FS	Mod	7	5	100	0
Stones						1	0.5		

*From Table 14, page 46 of MAFF ALC Guidelines, October 1988

Calculation: AP Wheat

Layer												
Topsoil	(18 x 100) / 100	+	(1 x 0) / 100	=	1800 / 100	=	18.0	x	40	=	720
Subsoil 1 ≤ 50cm	(15 x 100) / 100	+	(1 x 0) / 100	=	1500 / 100	=	15.0	x	0	=	0.0
Subsoil 2 ≤ 50cm	(15 x 100) / 100	+	(1 x 0) / 100	=	1500 / 100	=	15.0	x	10	=	150.0
50 cm											
Subsoil 3 > 50cm	(13 x 100) / 100	+	(0.5 x 0) / 100	=	1300 / 100	=	13.0	x	28	=	364.0
Subsoil 4 ≤ 120cm	(5 x 100) / 100	+	(0.5 x 0) / 100	=	500 / 100	=	5.0	x	42	=	210.0

AP Wheat = (720.0 + 0.0 + 150.0 + 364.0 + 210.0) / 10 = 144 mm

	AP		MD*		MB	Grade (re Table 8, ALC Guidelines)
Moisture Balance Wheat =	144 mm	-	124	mm =	**20 mm**	2

* Moisture Deficit (MD) value from Met. Office interpolated data for site.

Calculation of Crop-Adjusted Soil Available Water Capacity (AP) and Moisture Balances for Potatoes

(re Appendix 4 and Page 26 of the ALC Guidelines, October 1988)

Project: Sizewell C (Main Site)
Auger/Pit Auger 3 (assuming loamy fine sand over fine sand)

Layer	Upper (cm)	Lower (cm)	Thickness (cm)	Texture Class	Structure Cond	TAv*	EAv*	Mineral (%)	Stones (%)
Topsoil	**0**	40	40	LFS	n/a	18	n/a	100	0
Subsoil 1	40	78	38	LFS	Mod	15	n/a	100	0
Subsoil 2	70	**70**	0	LFS	Mod	15	n/a	100	0
Subsoil 3 ≤ 70cm	70	**70**	0	n/a	n/a	0	n/a	100	0
Stones						1	0.5		

*From Table 14, page 46 of MAFF ALC Guidelines, October 1988

Calculation: AP Potatoes

Layer

Topsoil $\frac{(18 \times 100) + (1 \times 0)}{100} = \frac{1800}{100} = 18 \times 40 = 720$

Subsoil 1 $\frac{(15 \times 100) + (1 \times 0)}{100} = \frac{1500}{100} = 15 \times 38 = 570.0$

Subsoil 2 ≤ 70 cm $\frac{(15 \times 100) + (1 \times 0)}{100} = \frac{1500}{100} = 15 \times 0 = 0.0$

Subsoil 3 ≤ 70 cm $\frac{(0 \times 100) + (1 \times 0)}{100} = \frac{0}{100} = 0 \times 0 = 0.0$

AP Potatoes = $\frac{720.0 + 570.0 + 0.0 + 0.0}{10} = 129$ mm

	AP		MD*		MB	Grade (re Table 8, ALC Guidelines)
Moisture Balance Pots =	129 mm	-	121	mm =	**8 mm**	2

* Moisture Deficit (MD) value from Met. Office interpolated data for site.

Calculation of Crop-Adjusted Soil Available Water Capacity (AP) and Moisture Balances for Wheat

(re Appendix 4 and Page 26 of the ALC Guidelines, October 1988)

Project: Sizewell C (Main Site)
Auger/Pit Auger 3 (assuming loamy medium sand over medium sand)

Layer	Upper (cm)	Lower (cm)	Thickness (cm)	Texture Class	Structure Cond	TAv*	EAv*	Mineral (%)	Stones (%)
Topsoil	**0**	40	40	LMS	n/a	13	n/a	100	0
Subsoil 1 ≤ 50cm	40	40	0	LMS	Mod	9	n/a	100	0
Subsoil 2 ≤ 50cm	40	**50**	10	LMS	Mod	9	n/a	100	0
Subsoil 3 > 50cm	50	78	28	LMS	Mod	9	6	100	0
Subsoil 4 ≤ 120cm	78	**120**	42	MS	Mod	7	5	100	0
Stones						1	0.5		

*From Table 14, page 46 of MAFF ALC Guidelines, October 1988

Calculation: AP Wheat

Layer												
Topsoil	(13 x 100) / 100	+	(1 x 0) / 100	=	1300 / 100	=	13.0	x	40	=	520
Subsoil 1 ≤ 50cm	(9 x 100) / 100	+	(1 x 0) / 100	=	900 / 100	=	9.0	x	0	=	0.0
Subsoil 2 ≤ 50cm	(9 x 100) / 100	+	(1 x 0) / 100	=	900 / 100	=	9.0	x	10	=	90.0
50 cm											
Subsoil 3 > 50cm	(6 x 100) / 100	+	(0.5 x 0) / 100	=	600 / 100	=	6.0	x	28	=	168.0
Subsoil 4 ≤ 120cm	(5 x 100) / 100	+	(0.5 x 0) / 100	=	500 / 100	=	5.0	x	42	=	210.0

AP Wheat = (520.0 + 0.0 + 90.0 + 168.0 + 210.0) / 10 = 99 mm

	AP		MD*		MB	Grade (re Table 8, ALC Guidelines)
Moisture Balance Wheat =	99 mm	-	124	mm =	**-25 mm**	3b

* Moisture Deficit (MD) value from Met. Office interpolated data for site.

Calculation of Crop-Adjusted Soil Available Water Capacity (AP) and Moisture Balances for Potatoes

(re Appendix 4 and Page 26 of the ALC Guidelines, October 1988)

Project: Sizewell C (Main Site)
Auger/Pit Auger 3 (assuming loamy medium sand over medium sand)

Layer	Upper (cm)	Lower (cm)	Thickness (cm)	Texture Class	Structure Cond	TAv*	EAv*	Mineral (%)	Stones (%)
Topsoil	**0**	40	40	LMS	n/a	13	n/a	100	0
Subsoil 1	40	78	38	LMS	Mod	13	n/a	100	0
Subsoil 2	70	**70**	0	n/a	n/a	0	n/a	100	0
Subsoil 3 ≤ 70cm	70	**70**	0	n/a	n/a	0	n/a	100	0
Stones						1	0.5		

*From Table 14, page 46 of MAFF ALC Guidelines, October 1988

Calculation: AP Potatoes

Layer

Topsoil $\frac{(13 \times 100) + (1 \times 0)}{100} = \frac{1300}{100} = 13 \times 40 = 520$

Subsoil 1 $\frac{(13 \times 100) + (1 \times 0)}{100} = \frac{1300}{100} = 13 \times 38 = 494.0$

Subsoil 2 ≤ 70 cm $\frac{(0 \times 100) + (1 \times 0)}{100} = \frac{0}{100} = 0 \times 0 = 0.0$

Subsoil 3 ≤ 70 cm $\frac{(0 \times 100) + (1 \times 0)}{100} = \frac{0}{100} = 0 \times 0 = 0.0$

AP Potatoes = $\frac{520.0 + 494.0 + 0.0 + 0.0}{10} = 101$ mm

	AP		MD*		MB	Grade (re Table 8, ALC Guidelines)
Moisture Balance Pots =	101 mm	-	121	mm =	**-20 mm**	3a

* Moisture Deficit (MD) value from Met. Office interpolated data for site.

APPENDIX 17A2: AUGER LOG AND KEY

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
1	TM	45000	65501	13	1	W	CER	0	25	25	75YR32						MSL	5	HR		N			-5.27	-15.81	3a	I	1	3a	Drought	1>2,0>6
								25	50	25	75YR54						MCL	2	HR	M	N										
								50	70	20	75YR54						MSL	2	HR	M	N										
								70	90	20							MSL	20	HR	M											STONES
								90	120								IMP			P										
2	TM	45100	65500	14	0		CER	0	25	25	75YR32						MSL	8	HR		VS			14.67	-18.55	3a	I	1	3a	Drought	
								25	50	25	75YR43						MSL	5	HR	M											
								50	70	20	75YR54						HCL	2	HR	M											
								70	120	50	75YR56						HCL	20	CH	M											Large chalk stone at 100cm
3	TM	45200	65499	13	4	N	CER	0	20	20	75YR43						HCL	10	HR		S			-53.02	-49.055	4	III	3b	4	Drought	2>2,0>6
								20	45	25	10YR52	CM	10YR58	CM	5Y42	Y	HCL	5	CH	P	M		Y								Located in depression/old pit
								45	55	10	5YR54						MSL	2	CH	M	M										
								55																							Large stone/field drain
4	TM	45299	65500	14	0		CER	0	25	25	75YR32						MSL	5	HR		N			18.51	-13.85	3a	I	1	3a	Drought	1>2,0>6
								25	70	45	75YR54						HCL	2	HR	M	N										
								70	100	30	75YR66						HCL	20	HR	M	N										
								100	120	20	75YR56						MSL	2	HR	M	N										
5	TM	45399	65497	13	1	SE	SBT	0	25	25	75YR32						MS	10	HR		N			-71.895	-68.41	4	I	1*	4	Drought	2>2,0>6
								25	55	30	75YR54						MS	2	HR	M	N										
								55	75	20							MS	20	HR	M											STONES
								75	120								IMP			P										
6	TM	45502	65500	12	1	SW	SBT	0	25	25	75YR32						MS	5	HR		N			-70.52	-67.035	4	I	1*	4	Drought	1>2,0>6
								25	55	30	75YR54						MS	2	HR	M	N										
								55	75	20							MS	20	HR	M											STONES
								75	120								IMP			P										
7	TM	44998	65400	13	2	W	CER	0	30	30	75YR32						LMS	2	HR		N			-15.91	-44.5	3b	I	1*	3b	Drought	0>2
								30	60	30	75YR54						LMS	2	HR	M	N										
								60	100	40	75YR56						MCL	2	HR	M	N										
								100	120	20	75YR74						MS	0		M	V										Weathered limestone at depth
8	TM	45099	65400	13	3	S	CER	0	30	30	75YR32						SCL	10	HR		S			13.625	-18.15	3a	I	1	3a	Drought	2>2,0>6
								30	45	15	75YR33						SCL	8	HR	M	S										
								45	100	55	75YR44						MSL	5	HR	M	S										
								100	120	20	75YR66						MS	0		M	S										
9	TM	45198	65399	15	0		CER	0	25	25	75YR32						MSL	8	HR		N			14.6375	-18.975	3a	I	1	3a	Drought	2>2,0>6
								25	45	20	75YR44						MSL	5	HR	M	N										
								45	75	30	75YR56						HCL	5	HR	M	N										
								75	120	45	75YR56						HCL	20	CH	M	M										
10	TM	45301	65398	15	1	NE	CER	0	25	25	75YR32						MSL	5	HR		N			9.455	-27.57	3a	I	1	3a	Drought	0>2
								25	45	20	75YR44						LMS	2	HR	M	N										

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								45	75	30	75YR56						HCL	2	HR	M	N									
								75	120	45	75YR56						MSL	20	CH	M	M									
11	TM	45396	65403	13	1	NE	SBT	0	25	25	75YR32						MS	5	HR		N			-76.265	-72.295	4	I	1*	4	Drought	1>2,0>6
								25	50	25	75YR44						MS	2	HR	M	N									
								50	60	10	75YR53						MS	2	HR	M	N									
								60	120								IMP			P										Sandstone
12	TM	45501	65396	12	0		SBT	0	25	25	75YR32						MS	5	HR		N			-51.535	-64.415	4	I	1*	4	Drought	0>2
								25	55	30	75YR43						MS	2	HR	M	N									
								55	90	35	75YR33						MS	2	HR	M	N									Buried topsoil?
								90	110	20	75YR54						MS	0		M	N									or CS
								110	120								IMP			P										Sandstone
13	TM	44998	65278	13	1	W	FLW	0	25	25	75YR32						LMS	10	HR		N			-0.8675	-37.375	3b	I	1*	3b	Drought	1>2,0>6 locally greater stone%
								25	40	15	75YR44						LMS	5	HR	M	N									Close to farm and headland
								40	55	15	75YR56						HCL	5	HR	M	N									Used for vehicle turning/parking
								55	90	35	75YR56						MSL	2	HR	M	N									Compacted soil
								90	110	20	75YR56						HCL	2	HR	M	N									
								110	120	10	75YR56						LMS	2	HR	M	N									
14	TM	45099	65284	15	0		FLW	0	25	25	75YR32						LMS	2	HR		N			-40.59	-59.2	4	I	1*	4	Drought	Game cover vegetation?
								25	40	15	75YR44						LMS	2	HR	M	N									
								40	120	80	75YR54						MS	2	HR	M	N									
15	TM	45191	65281	16	0		FLW	0	25	25	75YR32						LMS	2	HR		N			-40.59	-59.2	4	I	1*	4	Drought	Game cover vegetation?
								25	40	15	75YR44						LMS	2	HR	M	N									
								40	120	80	75YR54						MS	2	HR	M	N									
16	TM	45402	65299	15	0		SBT	0	25	25	75YR43						LMS	10	HR		N			-65.085	-61.6	4	I	1*	4	Drought	3>2,1>6
								25	40	15	75YR44						LMS	2	HR	M	N									
								40	75	35	75YR56						MS	2	HR	M	N									
								75	120								IMP			P										Sandstone
17	TM	45300	65200	16	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N									
								45	120	75							IMP														Compaction
18	TM	45379	65199	16	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N									
								45	120	75							IMP														Compaction
19	TM	45000	65100	13	1	NW	CER	0	25	25	75YR32						MSL	10	HR		N			-14.62	-43.07	3b	I	1	3b	Drought	3>2,1>6
								25	35	10	75YR42						MSL	5	HR	M	N									
								35	60	25	75YR54						LMS	2	HR	M	N									
								60	80	20	75YR64						MS	1	HR	M	N									

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								80	90	10	75YR56	FF	10YR61				HCL	2	HR	M	M	C									and CH
								90	120	30	75YR56	CF	10YR61			Y	HCL	2	HR	P	M	C	Y?								and CH
20	TM	45299	65100	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
21	TM	44999	65000	14	1	N	CER	0	25	25	75YR32						MSL	10	HR		N			-32.725	-29.28	3b	III	2	3b	Drought	3>2,1>6
								25	35	10	75YR44						MSL	5	HR	M	N										
								35	55	20	75YR54	CF	75YR62	FF	75YR56	Y	C	2	HR	P	N		Y								
								55	70	15	75YR54	CF	75YR62	FF	75YR56	Y	HCL	20	CH	P	M		Y								
								70	90	20							HCL	40	CH	P											AND FLINTS
								90	120								IMP			P											
22	TM	45100	65000	14	2	NE	CER	0	25	25	75YR32						MSL	10	HR		N			-16.265	-29.7	3a	II	1	3a	Drought	3>2,1>6
								25	40	15	75YR44						MSL	5	HR	M	N										
								40	65	25	75YR56	CF	10YR61			Y	HCL	2	HR	P	N		Y								
								65	90	25	75YR56	CF	10YR61			Y	HCL	10	CH	P	M		Y								
								90	110	20							HCL	20	HR	P											FLINTS
								110	120								IMP			P											
23	TM	45200	64999	16	0		WHT	0	25	25	75yr32						MCL	5	HR		N			3.93	-17.2	3a	II?	2	3a	Drought	
								25	35	10	75yr44						HCL	5	HR	M	N										
								35	45	10	10yr53	CF	10yr61	CF	10yr56	Y	C	5	HR	P	N	F	Y								not deep enough to be SP alone
								45	70	25	10yr53	CF	10yr61	CF	10yr56	Y	SCL	2	HR	M	N		N							
								70	120	50	10yr53	CM	10yr51	CM	10yr56	Y	C	5	CH	P	M	F	Y								
24	TM	45300	65000	17	0		WHT	0	25	25	75yr32						MSL	5	HR		N			-82.2	-80.2	4	I	1	4	Drought	
								25	30	5	75yr44						LMS	5	HR	M	N										
								30	120	90							IMP														Compaction
25	TM	45400	65000	18	1	S	STB	0	25	25	75YR43						LMS	5	HR		N			-49.435	-59.03	4	I	1*	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	65	20	75YR54						MS	2	HR	M?	N										Very compact
								65	85	20	75YR56						MS	2	HR	M	N										
								85	105	20							MS	20	HR	M											STONES
								105	120								IMP			P											
26	TM	45499	64999	15	1	S	STB	0	25	25	75YR32						LMS	2	HR		N			-58.075	-55.6	4	I	1*	4	Drought	
								25	60	35	75YR44						LMS	5	HR	M	N										
								60	80	20							LMS	20	HR	M											STONES
								80	120								IMP			P											
27	TM	44912	64898	12	1	W	CER	0	25	25	75YR32						MSL	5	HR		N			-49.595	-48.81	3b	I	1	3b	Drought	0>2
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	60	15	75YR56						MS	1	HR	M	N										
								60	80	20							MS	20	HR	M	N										FLINTS
								80	120								IMP			P											
28	TM	45000	64898	16	0		CER	0	25	25	75YR42						LMS	5	HR		N			-41.115	-59.92	4	I	1*	4	Drought	0>2
								25	40	15	75YR44						LMS	2	HR	M	N										
								40	120	80	75YR54						MS	1	HR	M	N										

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
29	TM	45100	64900	13	0		CER	0	25	25	75YR32						MSL	5	HR		N			11.075	-18.26	3a	I	1	3a	Drought	1>2,0>6
								25	40	15	75YR44						MSL	2	HR	M	N										
								40	75	35	75YR56,66						MSL	2	HR	M	N										
								75	90	15	75YR56,66						MSL	5	CH	M	M										
								90	110	20							MSL	20	HR	M											
								110	120								IMP			P											
30	TM	45200	64900	16	0		WHT	0	25	25	75yr32						MSL	5	HR		N			-33.985	-23.64	3b	III	2	3b	Drought	
								25	35	10	75yr44						MSL	5	HR	G	N										
								35	75	40	10yr53	CF	10yr61	CF	10yr56	Y	C	2	CH	P	M		Y								
								75	120	45							IMP														Stony?
31	TM	45400	64900	16	1	S	STB	0	25	25	75YR32						MSL	5	HR		N			0.095	-13.85	3a	I	1	3a	Drought	
								25	70	45	75YR54						HCL	2	HR	M	N										
								70	85	15	75YR66						MCL	30	CH	M	N										
								85	105	20							MCL	50	CH	M											STONE
								105	120								IMP			P											
32	TM	45499	64899	14	1	S	STB	0	25	25	75YR32						LMS	5	HR		N			-29.445	-60.42	4	I	1*	4	Drought	
								25	70	45	75YR44						LMS	2	HR	M	N										
								70	95	25	75YR56						MS	2	HR	M	N										
								95	115	20							MSL	20	HR	M											STONES MSL
								115	120								IMP			P											
33	TM	44899	64850	14	2	W	CER	0	25	25	75YR32						MSL	5	HR		N			-60.94	-56.44	4	I	1	4	Drought	0>2
								25	40	15	10YR56						LMS	2	HR	M	N										
								40	60	20							LMS	20	HR	M											STONES
								60	120								IMP			P											
34	TM	44999	64801	16	0		CER	0	25	25	75YR32						MSL	5	HR		N			-38.87	-46.68	3b	I	1	3b	Drought	0>2
								25	60	35	10YR56						LMS	2	HR	M	N										
								60	100	40	10YR66						MS	2	HR	M	N										
								100	120								IMP			P											Sandstone
35	TM	45102	64799	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
36	TM	45200	64799	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
37	TM	45298	64800	17	1	N	SAS	0	30	30	75YR32						MSL	2	HR		N			27.63	-16.08	3a	I	1	3a	Drought	
								30	80	50	75YR54						MSL	2	HR	M	N										
								80	100	20	75YR64						MSL	2	HR	M	N										
								100	120	20	75YR66						MSL	10	CH	M	V										
38	TM	45397	64800	15	1	S	STB	0	25	25	75YR32						MSL	8	HR		N			-15.6	-45.6	3b	I	1	3b	Drought	
								25	50	25	75YR44						LMS	2	HR	M	N										

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
							50	65	15	75YR64						MS	0		M	N										
							65	80	15	75YR54						MSL	0		M	N										
							80	110	30	75YR84						MS	0		M	N										
							110	120	10	75YR83						MSL	0		M	N										
39	TM	45499 64800	12	1	S	STB	0	25	25	75YR32						LMS	2	HR		N			-20.01	-53.32	3b	I	1*	3b	Drought	
							25	90	65	75YR44						LMS	2	HR	M	N										
							90	120	30	75YR56						MCL	2	HR	M	N										
40	TM	44926 64702	16	0		CER	0	25	25	75YR32						MSL	5			N			6.525	-26.05	3a	III	2	3a	Drought	1>2,0>6
							25	50	25	10YR54	CF	10YR62			Y	HCL	2		P	N	F	Y								
							50	75	25	10YR66						HCL	10		M	M										
							75	120	45	10YR66						HCL	30		M	M										
41	TM	45000 64699	17	0		CER	0	25	25	75YR32						MSL	2	HR		N			21.15	-19.3	3a	I	1	3a	Drought	0>2
							25	50	25	75YR44						MSL	2	HR	M	N										
							50	120	70	75YR66						MSL	10	HR	M	N										
42	TM	45099 64699	18	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
							25	45	20	75yr44						LMS	5	HR	G	N										
							45	120	75							IMP														Compaction
43	TM	45199 64700	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
							25	45	20	75yr44						LMS	5	HR	G	N										
							45	120	75							IMP														Compaction
44	TM	45300 64700	15	0		PGR	0	20	20	75YR42						LMS	2	HR		N			-18.24	-41.56	3b	I	1*	3b	Drought	
							20	50	30	75YR44						LMS	2	HR	M	N										
							50	70	20	75YR54						HCL	2	HR	M	N										
							70	90	20	75YR54	F	75YR62	F	75YR56	Y	HCL	2	CH	P	M		Y								
							90	120	30	75YR66						MSL	30	CH	M	V										
45	TM	45400 64700	15	0		CER	0	25	25	75YR32						LMS	2	HR		N			-30.03	-53.32	3b	I	1*	3b	Drought	
							25	70	45	75YR44						LMS	2	HR	M	N										
							70	80	10	75YR56						MSL	2	HR	M	N										
							80	100	20							MSL	20	HR	M											STONES
							110	120								IMP			P										
46	TM	45500 64700	14	0		CER	0	25	25	75YR32						LMS	2	HR					-63.2	-56.2	4	I	1*	4	Drought	
							25	50	25	75YR44						LMS	2	HR	M											
							50	70	20							MS	20	HR	P											Very compact and stony MS
							70	120								IMP			P										
47	TM	45600 64700	13	1	NE	CER	0	25	25	75YR32						LMS	2	HR		N			-30.975	-48	3b	I	1*	3b	Drought	
							25	50	25	75YR44						LMS	2	HR	M	N										
							50	85	35	75YR56						HCL	30	CH	M	N										
							85	105	20							HCL	50	CH	M											STONES

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								105	120								IMP			P											
48	TM	44862	64599	17	0		CER	0	25	25	75YR32						MSL	5	HR		N			18.97	-16.3	3a	I	1	3a	Drought	1>2,0>6
								25	50	25	75YR53						MSL	2	HR	M	N										
								50	120	70	75YR56						HCL	2	HR	M	N	C									
49	TM	44900	64599	17	0		CER	0	25	25	75YR32						MSL	5			N			6.55	-26.05	3a	III	2	3a	Drought	1>2,0>6
								25	50	25	10YR54	CF	10YR62			Y	HCL	2		P	N	F	Y								
								50	70	20	10YR66						HCL	10		M	M										
								70	120	50	10YR66						HCL	30		M	M										
50	TM	45000	64600	18	0		CFW	0	30	30	75yr42						LMS	10	HR		N			-76.8	-74.8	4	I	1*	4	Drought	recently established tree belt.
								30	50								LMS	20	HR	M	N										Stony
								50	120	90							IMP														
51	TM	45100	64600	18	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	pit showed platy structure LMS
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
52	TM	45200	64600	18	0		WHT	0	25	25	75yr32						LMS	10	HR		N			-64.5875	-61.15	4	I	1*	4	Drought	
								25	55	30	75yr44						LMS	5	HR	G	N										
								55	120	65							IMP														Compaction
53	TM	45292	64640	15	2	S	PGR	0	20	20	75YR42						LMS	2	HR		N			11.35	-23.92	3a	I	1*	3a	Drought	Heavily poached, near gate
								20	50	30	75YR56						MSL	2	HR	M	N										
								50	120	70	75YR66						MCL	2	HR	M	N										IMP @ 70cm for stone
54	TM	45399	64600	16	0		CER	0	25	25	75YR32						LMS	2	HR		N			-5.2	-50.38	3b	I	1*	3b	Drought	
								25	65	40	75YR54						LMS	2	HR	M	N										
								65	100	35	75YR54						MSL	2	HR	M	N										
								100	120	20	75YR66						MSL	10	CH	M	N										
55	TM	45500	64600	15	0		CER	0	25	25	75YR32						LMS	2	HR		N			-34.45	-53.32	3b	I	1*	3b	Drought	
								25	70	45	75YR44						LMS	2	HR	M	N										
								70	100	30	75YR54						MS	2	HR	M	N										
								100	120	20	75YR54						LMS	2	HR	M	N										
56	TM	45600	64599	15	1	E	CER	0	25	25	75YR32						LMS	2	HR		N			-9.82	-39.6	3b	I	1*	3b	Drought	
								25	50	25	75YR44						LMS	2	HR	M	N										
								50	90	40	75YR56						HCL	2	HR	M	N	F									
								90	120	30	75YR56	F	75YR51	F	75YR58	Y	C	2	HR	M	N	F	Y								

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
57	TM	44816	64509	17	0		CER	0	25	25	75YR32						MSL	5	HR		N			12.97	-23.96	3a	III	2	3a	Drought	0>2
								25	50	25	75YR62	CF	75YR58			Y	SCL	2	HR	M	N		N							
								50	60	10	75YR53	CF	75YR61	CF	75YR56	Y	HCL	2	HR	P	N		Y							
								60	80	20	75YR54	CF	75YR61	CF	75YR56	Y	C	2	HR	P	N	C	Y							
								80	120	40	10YR56						MSL	5	HR	M	N									
58	TM	44898	64499	17	1	S	CER	0	25	25	75YR32						MSL	5	HR		N			-0.78	-24.14	3a	III	2	3a	Drought	1>2,0>6
								25	35	10	75YR56						HCL	2	HR	M	N										Very saturated from surface
								35	90	55	75YR56	FF	10YR52			Y	C	2	HR	P	N	C	Y							
								90	120	30	75YR56						C	20	CH	M	M									
59	TM	45008	64500	19	0		CER	0	25	25	75YR32						LMS	5	HR		N			-24.9225	-58.74	4	I	1*	4	Drought	
								25	55	30	75YR44						LMS	5	HR	M	N										
								55	80	25	75YR64						MS	2	HR	M	N										
								80	90	10	75YR66						MS	2	HR	M	N										
								90	120	30	75YR56						MCL	2	CH	M	N										
60	TM	45099	64499	19	0		CER	0	25	25	75YR32						LMS	8	HR		N			-74.8	-72.8	4	I	1*	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	50	5	75YR44						LMS	2	HR	P	N										
																	IMP													Compaction
61	TM	45200	64499	18	0		CER	0	25	25	75YR32						MSL	5	HR		N			-1.81	-26.9	3a	II	1	3a	Drought	
								25	45	20	75YR44						MSL	2	HR	M	N										
								45	60	15	75YR44						MSL	2	HR	P	N										
								60	120	60	10YR54	F	10YR62	F	10YR66	Y	HCL	2	HR	P	N		Y							
62	TM	45000	64400	19	0		CER	0	25	25	75YR32						LMS	8	HR		N			-79.7	-77.7	4	I	1*	4	Drought	
								25	45	20	75YR54						LMS	5	HR	M	N										
								45	50	5	75YR54						LMS	5	HR	P	N										
																	IMP													Compaction
63	TM	45100	64400	18	0		CER	0	25	25	75YR32						LMS	8	HR		N			-79.7	-77.7	4	I	1*	4	Drought	
								25	45	20	75YR54						LMS	5	HR	M	N										
																	IMP													Compaction
64	TM	45191	64399	17	0		CER	0	25	25	75YR32						MSL	2	HR		N			-63.2	-61.2	4	I	1	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	50	5	75YR44						LMS	2	HR	P	N										
																	IMP													Compaction
65	TM	45000	64400	18	0		CER	0	25	25	75YR32						LMS	5	HR		N			-78.32	-76.32	4	I	1*	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
																	IMP													Compaction
66	TM	45100	64299	17	1	S	CER	0	25	25	75YR32						LMS	8	HR		N			-79.7	-77.7	4	I	1*	4	Drought	
								25	45	20	75YR54						LMS	5	HR	M	N										

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour		IMP	%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	Compaction
67	TM	45511 63390	6			Meadow	0	45	45	10YR43						LS	2	HR		N			-31.425	-50.23	3b	I	1	3b	Drought	
						Habitat	45	75	30	10YR56						S	<1	HR	M	N										
						Creation	75	120	45	10YR68						S	<1	HR	M	N										
68	TM	45434 63499	1			Meadow	0	45	45	10YR22						SCL	<1	HR		N			-31.425	-50.23	3b	I	1	3b	Drought	Highly organic/wet material
						Habitat	45	120	75	10YR21						LS	<1	HR	G	N										
						Creation																								
69	TM	45322 63599	6			Meadow	0	50	50	10YR53						LS	2	HR		V			-28.2745	-47.32	3b	I	1	3b	Drought	
						Grazing	50	65	15	10YR43						S	<1	HR	M	N										
							65	83	18	10YR36						S	<1	HR	M	N										
							83	120	37	10YR58						S	<1	HR	M	N										
70	TM	45322 63599	6			Meadow	0	15	15	10YR46						LS	<1	HR		N			-23.735	-43.155	3b	I	1	3b	Drought	
						Grazing	15	55	40	10YR32						LS	2	HR	G	M										
							55	65	10	10YR34						LS	<1	HR	G	N										
							65	90	25	10YR66						S	<1	HR	M	N										
							90	100	10	10YR56	C	2.5Y63	M	10YR58	Y	C	<1	HR	P	N										
							100	120	20	10YR66						S	<1	HR	M	N										
71	TM	44512 63700	7			Meadow	0	20	20	10YR43						LS	2	HR		N			-39.2725	-65.08	4	I	1	4	Drought	Flint; >2cm 1%
						Habitat	20	75	55	10YR56						S	2	HR	M	N										Flint; >2cm 1%
						Creation	75	110	35	2.5Y53	F	10YR56			Y	C	<1	HR	P	N		Y							
							110	120	10	2.5Y66						S	<1	HR	M	N										
72	TM	45022 63699	10			Meadow	0	42	42	10YR53						LS	2	HR		V			-65.874	-63.08	4	I	1	4	Drought	
						Habitat	42	54	12	10YR43						S	<1	HR	M	M										
						Creation	IMP																							STOP @ GRAVEL
73	TM	45122 63699	9			Meadow	0	42	42	10YR33						SL	2	HR		V			3.093	-21.652	3a	I	1	3a	Drought	
						Habitat	42	90	48	10YR54						LS	<1	HR	G	M										
						Creation	90	120	30	10YR34						S	<1	HR	M	N										
74	TM	45222 63699	11			Meadow	0	30	30	2.5Y64						LS	<1	HR		N			-6.135	-38.8	3b	I	1	3b	Drought	
						Habitat	30	110	80	10YR31						LS	<1	HR	G	N										
						Creation	110	120	10	10YR56						S	<1	HR	M	N										
75	TM	45322 63699	12			Meadow	0	50	50	10YR32						LS	2	HR		S			-28.515	-47.32	3b	I	1	3b	Drought	
						Habitat	50	95	45	10YR44						S	<1	HR	M	N										
						Creation	95	120	25	10YR54						S	<1	HR	M	N										

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
76	TM	44522 63799	8			Meadow	0	35	35	10YR43						LS	5	HR		N			-54.568	-46.618	4	II	1	4	Drought	Flint; >2cm 2%
						Habitat	35	43	8	10YR56						S	<1	HR	M	N									
						Creation	43	70	27	10YR53	M	7.5YR58			Y	SL	<1	HR	P	N		Y								STOP @ Gravel
							IMP																						
77	TM	44622 63799	13			Potatoes	0	50	50	10YR44						LS	2	HR		N			33.855	-23.56	3a	I	1	3a	Drought	Large flint on surface
							50	78	28	10YR46						SCL	<1	HR	G	N									
							78	120	42	10YR66						SCL	<1	HR	G	N									
78	TM	44722 63799	14			Potatoes	0	40	40	10YR43						SL	2	HR		N			-0.835	-17.66	3a	I	1	3a	Drought	
							40	60	20	10YR46						SL	<1	HR	G	N									
							60	120	60	10YR66						S	<1	HR	G	N									
79	TM	44822 63799				Cereals	0	50	50	10YR44						LS	5	HR		N			-30.414	-49.24	3b	I	1	3b	Drought	Large flint on surface
							50	72	22	10YR56						S	2	HR	G	N									
							72	120	48	10YR58						S	<1	HR	G	N									
80	TM	44922 63799	14			Cereals	0	50	50	10YR44						LS	5	HR		N			-31.305	-49.6	3b	I	1	3b	Drought	
							50	105	55	10YR56						S	5	HR	M	N									Flint; >2cm 2%
							105	120	15	10YR58						S	<1	HR	G	N									
81	TM	45022 63799	14			Cereals	0	45	45	10YR44						LS	5	HR		N			-56.48	-51.53	4	I	1	4	Drought	
							45	60	15	10YR34						LS	2	HR	G	N									
							IMP																						STOP @ GRAVEL
82	TM	45104 63807				Cereals	0	48	48	10YR32						LS	<1	HR		N			-39.961	-48.436	3b	I	1	3b	Drought	Flints on surface
							48	100	52	10YR56						S	5	HR	M	N									
							IMP																						STOP @ GRAVEL
83	TM	45151 63842	13			Spring	0	50	50	10YR33						LS	2	HR		N			-28.515	-47.32	3b	I	1	3b	Drought	Large flint on surface
						Onions	50	110	60	10YR64						S	<1	HR	G	N									
							110	120	10	2.5Y64						S	<1	HR	G	N									
84	TM	45267 63851	16			Spring	0	50	50	10YR32						LS	2	HR		S			-18.6325	-37.64	3b	I	1	3b	Drought	Large flint on surface
						Onions	50	75	25	10YR43						LS	2	HR	G	N									
							75	90	15	10YR56						S	<1	HR	M	N									
							90	120	30	2.5Y64						S	<1	HR	M	N									

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
85	TM	44822	63899	16			Cereals	0	50	50	10YR34						LS	5	HR		N			-7.9925	-38.465	3b	I	1	3b	Drought	Flint; >2cm 2%
								50	65	15	10YR46						LS	5	HR	G	N										
								65	110	45	10YR56						SC	2	HR	M	N	Y									
								IMP																						STOP @ GRAVEL
86	TM	44922	63899	17			Cereals	0	40	40	10YR44						LS	5	HR		N			-67.9825	-64.99	4	I	1	4	Drought	Flint; >2cm 2%
								40	55	15	10YR46						S	1	HR/CH	G	S										Some chalk present
								IMP																						STOP @ GRAVEL
87	TM	45022	63899	17			Cereals	0	45	45	10YR33						LS	<1	HR		N			-55.78	-49.84	4	I	1	4	Drought	Large flint on surface
								45	70	25	10YR46						S	2	HR	M	N										
								IMP																						STOP @ GRAVEL
88	TM	45122	63899	15			Spring	0	40	40	10YR33						LS	2	HR		N			-27.3675	-52.685	3b	I	1	3b	Drought	
							Onions	40	55	15	10YR44						LS	<1	HR	G	N										
								55	90	35	10YR56	F	10YR43				S	2	HR	M	N										Flint; >2cm 2%
								90	120	30	10YR76	F	10YR58				S	<1	HR	G	N										
89	TM	45222	63899	14			Spring	0	45	45	10YR32						LS	2	HR		N			-31.425	-50.23	3b	I	1	3b	Drought	Flint; >2cm 1%
							Onions	45	85	40	10YR34						S	<1	HR	M	N										
								85	120	35	2.5Y66						S	<1	HR	G	N										
90	TM	45281	63911	14			Spring	0	45	45	10YR33						SL	<1	HR		N			-22.975	-31.87	3b	I	1	3b	Drought	Large flint on surface
							Onions	45	80	35	10YR44						S	<1	HR	M	N										
								80	100	20	7.5YR44	F	7.5YR56				S	<1	HR	M	N										
								IMP																						STOP @ GRAVEL
91	TM	45122	63999	17			Onions	0	40	40	10YR43						SL	2	HR		N			-16.395	-37.64	3b	I	1	3b	Drought	Flint; >2cm 1%
								40	70	30	10YR54						S	2	HR	M	N										Flint; >2cm 1%
								70	95	25	10YR58	F	10YR43				S	2	HR	M	N										
								95	110	15	10YR58						SCL	2	HR	M	N	Y									
								IMP																						STOP @ GRAVEL
92	TM	45230	63978	15			Onions	0	45	45	10YR43						SL	2	HR		N			-13.785	-32.59	3b	I	1	3b	Drought	Flint; >2cm 1%
								45	70	25	10YR56						S	<1	HR	M	N										
								70	120	50	10YR58						S	<1	HR	M	N										
93	TM	45122	64099	20			Grazing	0	45	45	10YR44						SL	<1	HR		N			-13.725	-32.47	3b	I	1	3b	Drought	
								45	80	35	7.5YR44						S	5	HR	M	N										Flint; >2cm 2%
								80	120	40	10YR56						S	<1	HR	M	N										
94	TM	45222	64099	16			Grazing	0	45	45	10YR43						SL	1	HR		N			-11.27	-32.47	3b	I	1	3b	Drought	
								45	80	35	7.5YR44						S	5	HR	M	N										Flint; >2cm 2%

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
							80	110	30	10YR66						S	5	HR	M	N									Flint; >2cm 2%
							110	120	10	10YR54						C	5	HR	M	N									
95	TM	45122 64199	16			Grazing	0	50	50	10YR43						SL	1	HR		N			14.5375	-7.12	2	I	1	2	Drought	Flint; >2cm 1%
							50	85	35	10YR44						SL	1	HR	G	N									
							85	110	25	10YR56						S	2	HR	M	N									Flint; >2cm 1%
							IMP																						STOP @ Gravel
96	TM	45222 64199	16			Grazing	0	40	40	10YR43						SL	2	HR		N			17.985	-12.76	2	I	1	2	Drought	Flint; >2cm 2%
							40	50	10	10YR44						SL	2	HR	M	N	Y								Flint; >2cm 2%
							50	75	25	10YR54						SL	10	CH/HI	G	V									Flint; >2cm 2%
							75	90	15	10YR56						SL	2	CH/HI	G	V									
							90	120	30	10YR66						S	<1	CH/HI	M	V									
97	TM	45322 64199	14			Grazing	0	45	45	10YR43						SL	2	HR		N			22.71	-7.84	2	I	1	2	Drought	
							45	90	45	10YR44						SL	<1	HR	G	N									
							90	120	30	10YR56						S	2	HR	M	N									
98	TM	45222 64299	17			Grazing	0	40	40	10YR43						SL	1	HR		N			-15.054	-22.852	3a	I	1	3a	Drought	
							40	58	18	10YR44						SL	<1	HR	M	N									
							58	102	44	10YR56						S	5	HR	M	N									Flint; >5cm 1%
							IMP																						STOP @ GRAVEL
99	TM	45322 64199	15			Grazing	0	40	40	10YR43						SL	1	HR		N			11.685	-7.12	2	I	1	2	Drought	Flint; >5cm 1%
							40	75	35	10YR44						SL	<1	HR	G	N									
							75	120	45	10YR56						S	<1	HR	M	N									
100	TM	45501 63100	16	0		WHT	0	25	25	7.5YR32						LMS	5	HR		N			-36.145	-54.19	3b	I	1	3b	Drought	
							25	35	10	75YR54						LMS	5	CH	M	M									
							35	55	20	7.5YR66						LMS	2	HR	M	M									
							55	80	25	10YR54						LMS	2	HR	M	N									
							80	120	40	7.5YR66						MS	0		M	N									
101	TM	45598 63100	14	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-38.96	-58.22	4	I	1	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	70	25	7.5YR44						MS	2	HR	M	N									Band of flint at 70 cm
							70	120	50	7.5YR66						MS	2	HR	M	N									
102	TM	45197 62989	15	2	W	WHT	0	25	25	7.5YR54						LMS	2	HR		N			-38.96	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR54						LMS	2	HR	M	N									
							45	70	25	7.5YR54						MS	2	HR	M	N									
							70	120	50	7.5YR66						MS	2	HR	M	N									
103	TM	45299 63000	17	0		WHT	0	25	25	7.5YR32						LMS	8	HR		N			-29.76	-48.48	3b	I	1*	3b	Drought	
							25	50	25	7.5YR54						LMS	8	HR	M	N									
							50	70	20	7.5YR53	CF	7.5YR68	CF	7.5YR62	Y	C	2	HR	P	N		Y							

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
							70	95	25	7.5YR53	CF	7.5YR68	CM	7.5YR52		C	12	CH	M	M	F								
							95	115	20							C	20	CH	M										
							115	120								IMP			P										
104	TM	45398 63002	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-36.235	-55.46	4	I	1*	4	Drought	
							25	60	35	7.5YR54						LMS	2	HR	M	N									
							60	110	50	7.5YR56						MS	5	HR	M	N									
							110	120	10	10YR61	FC	10YR56			Y	C			P	N	F	Y							
105	TM	45488 62999	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-39.61	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	60	15	5YR44						MS	2	HR	M	N									
							60	120	60	7.5YR54						MS	2	HR	M	N									
106	TM	45596 63002	14	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-41.43	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	70	25	7.5YR44						MS	2	HR	M	N									
							70	100	30	7.5YR66						MS	2	HR	M	N									
							100	120	20							MS	20	HR	M										Flints
107	TM	44997 62877	11	4	NNW	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-54.35	-60.18	4	I	1*	4	Drought	
							25	35	10	7.5YR43						LMS	2	HR	M	N									
							35	70	35	7.5YR56						MS	2	HR	M	N									
							70	80	10	10YR62	CM	10YR56			Y	C	2	HR	P	N		N							
							80	90	10	7.5YR66						MS	2	HR	M	N									
							90	120								IMP			P										Sandstone
108	TM	45103 62901	11	3	NE	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-49.43	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	60	15	7.5YR44						MS	2	HR	M	N									
							60	100	40	7.5YR66						MS	2	HR	M	N									
							100	120								IMP			P										Sandstone
109	TM	45199 62900	13	2	WSW	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-51.885	-58.22	4	I	1*	4	Drought	
							25	40	20	7.5YR43						LMS	2	HR	M	N									
							40	90	50	7.5YR66						MS	2	HR	M	N									
							90	120								IMP			P										Sandstone
110	TM	45318 62898	15	2	SSE	WHT	0	25	25	7.5YR32						MSL	8	HR		N			-7.815	-29.89	3a	II	1	3a	Drought	
							25	50	25	7.5YR44						MSL	8	HR	M	N									
							50	65	15	7.5YR54						LMS	2	HR	M	N									
							65	95	30	10YR64		10YR62				C	2	HR	M	N	C	Y?							
							95	115	20							C	20	HR	M										Flints
							115	120								IMP			P										
111	TM	45399 62901	17	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-37.65	-55.28	4	I	1*	4	Drought	
							25	60	35	7.5YR43						LMS	2	HR	M	N									
							60	120	60	7.5YR66						MS	2	HR	M	N									
112	TM	45502 62897	17	0		WHT	0	25	25	7.5YR32						LMS	8	HR		N			-67.2	-61.8	4	I	1*	4	Drought	
							25	50	25	7.5YR43						LMS	5	HR	M	N									
							50	70	20							MS	20	HR	M										Flints
							70	120								IMP			P										
113	TM	45601 62900	17	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-64.8	-59.4	4	I	1*	4	Drought	Close to depression
							25	50	25	7.5YR43						LMS	2	HR	M	N									
							50	70	20							MS	20	HR	M										Flints
							70	120								IMP			P										
114	TM	45698 62897	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-40.025	-58.7	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	55	10	7.5YR44						MS	2	HR	M	N									
							55	65	10	7.5YR44						MS	10	HR	M	N									
							65	120	55	7.5YR66						MS	2	HR	M	N									
115	TM	45211 62813	14	2	W	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-37.65	-55.28	4	I	1*	4	Drought	
							25	60	35	7.5YR44						LMS	2	HR	M	N									
							60	100	40	5YR54						MS	2	HR	M	N									

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								100	120	20	7.5YR66						MS	2	HR	M	N										
116	TM	45300	02800	17	1	W	WHT	0	25	25	7.5YR43						LMS	2	HR		N			-17.07	-59.2	4	I	1*	4	Drought	
								25	40	15	7.5YR44						LMS	2	HR	M	N										
								40	80	40	7.5YR64						MS	2	HR	M	N										
								80	120	40	7.5YR64						MSL	2	HR	M	N										
117	TM	45400	62800	17	0		WHT	0	25	25	7.5YR32						LMS	5	HR		N			-36.375	-57.02	4	I	1*	4	Drought	
								25	60	35	7.5YR44						LMS	5	HR	M	N										
								60	110	50	7.5YR66						MS	2	HR	M	N										
								110	120	10	7.5YR54						C	2	HR	M	N										
118	TM	45499	62797	17	0		WHT	0	25	25	7.5YR32						MSL	8	HR		N			-18.6825	-40.76	3b	III	2	3b	Drought	
								25	55	30	7.5YR44						LMS	5	HR	M	N										
								55	120	65	7.5YR54	FF	7.5YR62	FF	7.5YR56	Y	C	2	HR	P	N	F	Y								
119	TM	45599	62799	17	0		WHT	0	25	25	7.5YR32						MSL	2	HR		N			-28.84	-33.23	3b	I	1	3b	Drought	
								25	55	30	7.5YR44						LMS	2	HR	M	N										
								55	70	15	7.5YR66						C	2	HR	M	N										
								70	110	40	7.5YR66						MS	2	HR	M	N										
								110	120								IMP			P											
120	TM	45699	62799	17	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-41.52	-59.2	4	I	1*	4	Drought	
								25	40	15	7.5YR43						LMS	2	HR	M	N										
								40	80	40	7.5YR54						MS	2	HR	M	N										
								80	90	10	10YR64	FF	10YR62	FF	10YR66		MS	2	HR	M	N	F										
								90	120	30	7.5YR54						MS	8	HR	M	N										
121	TM	45400	62699	17	0		WHT	0	25	25	7.5YR32						LMS	5	HR		N			-13.835	-55.06	4	I	1*	4	Drought	
								25	60	35	7.5YR44						LMS	5	HR	M	N										
								60	80	20	7.5YR64						LMS	2	HR	M	N										
								80	120	40	7.5YR54	C	10YR56			Y	MSL	2	HR	M	N										
122	TM	45504	62698	16	0		WHT	0	25	25	7.5YR32						MSL	5	HR		N			-45.765	-45.44	3b	I	1	3b	Drought	
								25	65	40	7.5YR44						LMS	2	HR	M	N										
								65	85	20							LMS	20	HR	M											Flints (3 attempts)
								85	120								IMP			P											
123	TM	45504	62698	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-6.645	-41.56	3b	I	1*	3b	Drought	
								25	50	25	7.5YR44						LMS	2	HR	M	N										
								50	95	45	7.5YR66						MSL	2	HR	M	N										
								95	115	20							MSL	20	HR	M											
								115	120								IMP			P											
124	TM	45699	62699	17	0		WHT	0	25	25	7.5YR32						MSL	10	HR					2.125	-20.75	3a	II	1	3a	Drought	
								25	60	35	7.5YR43						MSL	5	HR	M											
								60	100	40	10YR64	FF	10YR62	FF	10YR66		C	2	HR	M		F	Y?								
								100	120	20							C	20	HR	M											
125	TM	45499	62599	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-39.61	-58.22	4	I	1*	4	Drought	
								25	45	20	7.5YR43						LMS	2	HR	M	N										
								45	120	75	7.5YR66						MS	2	HR	M	N										
126	TM	45599	62599	15	1	S	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-39.61	-58.22	4	I	1*	4	Drought	
								25	45	20	7.5YR43						LMS	2	HR	M	N										
								45	120	75	7.5YR66						MS	2	HR	M	N										
127	TM	45684	62602	16	1	S	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-37.65	-55.28	4	I	1*	4	Drought	
								25	60	35	7.5YR43						LMS	2	HR	M	N										
								60	120	60	7.5YR66						MS	2	HR	M	N										

Auger Log key

Depth - Top

xx	Underlining denotes depth to the top of a slowly permeable layer

Land use

ARA	Arable
CER	Cereal
WHT	Wheat
BAR	Barley
MZE	Maize
OAT	Oats
OSR	Oilseed rape
LIN	Linseed
FBE	Field beans
POT	Potatoes
SBT	Sugar beet
BRA	Brassicas
FOD	Fodder crops
FRT	Soft and top fruit
HRT	Horticultural crops
PAS	Pasture
LEY	Ley grass
PGR	Permanent pasture
RGR	Rough grazing
SCR	Scrub
HTH	Heathland
BOG	Bog or marsh
DCW	Deciduous Woodland
CFW	Coniferous woodland
PLO	Ploughed
STB	Crop stubble
FLW	Fallow (inc. set aside)
SAS	Set aside (where known)
OTH	Other

Mottle 1,2 - Form

FF	Few Feint
FD	Few Distinct
FP	Few Prominent
CF	Common Feint
CD	Common Distinct
CP	Common Prominent
MF	Many Feint
MD	Many Distinct
MP	Many Prominent
VF	Very many Feint
VD	Very many Distinct
VP	Very many Prominent

Texture

CS	Coarse Sand
MS	Medium sand
FS	Fine Sand
LCS	Loamy Coarse Sand
LMS	Loamy Medium Sand
LFS	Loamy Fine Sand
CSL	Coarse Sandy Loam
MSL	Medium sandy loam
FSL	Fine Sandy Loam
CSZL	Coarse Sandy Silt Loam
MSZL	Medium Sandy Silt Loam
FSZL	Fine Sandy Silt Loam
ZL	Silt Loam
SCL	Sandy Clay Loam
MCL	Medium Clay Loam
HCL	Heavy Clay Loam
MZCL	Medium Silty Clay loam
HZCL	Heavy Silty Clay Loam
SC	Sandy Clay
ZL	Silty Clay
C	Clay
P	Peat
SP	Sandy Peat
LP	Loamy Peat
PL	Peaty Loam
PS	Peaty Sand
MZ	Marine Light Silts
IMP	Impenetrable to roots

Limitations

NN	None
OC	Overall climate
AE	Aspect
EX	Exposure
FR	Frost risk
GR	Gradient
MR	Microrelief
FL	Flood risk
TX	Texture
DP	Soil depth
CH	Chemical
WE	Wetness
WK	Workability
DR	Droughtiness
ER	Erosion risk
WD	Wetness/Droughtiness
ST	Topsoil stoniness

Stones - Type

HR	All hard rocks and stones
MSST	Soft, medium or coarse grained sandstone
SI	Soft weathered igneous or metamorphic rock
SLST	Soft oolitic or dolomitic limestone
FSST	Soft, fine grained sandstone
ZR	Soft, argillaceous or silty rocks
CH	Chalk or chalk stones
GH	Gravel composed of non-porous (hard) stones
GS	Gravel composed of porous (soft) stones

Subs Str (subsoil structural condition)

G	Good
M	Moderate
P	Poor

Calcareousness

N	Non-calcareous (<0.5% CaCO3)
VS	Very slightly calcareous (0.5 - 1% CaCO3)
S	Slightly calcareous (1 - 5% CaCO3)
M	Moderately calcareous (5 - 10% CaCO3)
V	Very calcareous (>10% CaCO3)
Y	Calcareous (>1% CaCO3)

Mn C (ferrimanganous concretions)

F	Few
C	Common
M	Many
V	Very many
Y	Common or greater

APPENDIX 17A3: PARTICLE SIZE DISTRIBUTION DATA SHEETS

Analysis Results (SOIL)

Customer
ARCADIS (UK) LIMITED
THE MILL
BRIMSCOMBE PORT
STROUD
GL5 2QG

Distributor
ARCADIS (UK) LTD
THE MILL
BRINSCOMBE PORT
BRINSCOMBE
STROUD
GLOS
GL5 2QG

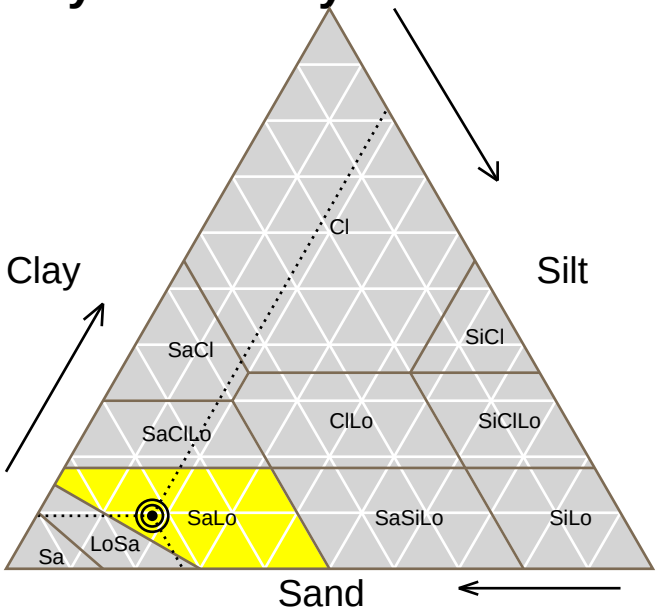
Sample Ref MDS 12 TOPSOIL H1

Date Received 30/07/2019 (Date Issued: 05/08/2019)

Sample No E337879/04

Crop

Physical Analysis



Analysis	Result (%)
Sand	72.66
Silt	17.88
Clay	9.46
Very Fine Sand	4.04
Fine Sand	29.86
Medium Sand	32.72
Coarse Sand	6.04
Very Coarse Sand	< 0.01
Stones >2mm	5.70
Soil Type	SaLo Sandy Loam

Property	Assessment
Available Water	Low to Medium
Drainage Rate	Rapid
Inherent Fertility	Low to Medium
Potential C.E.C.	Low to Medium
Leaching Risk	High to Moderate
Warming Rate	Rapid

Analytical Services
Tel: + 44(0) 1759 305116
Yara UK Limited - Pocklington
Email:ypl.laboratory@yara.com

Analysis Results (SOIL)

Customer
ARCADIS (UK) LIMITED
THE MILL
BRIMSCOMBE PORT
STROUD
GL5 2QG

Distributor
ARCADIS (UK) LTD
THE MILL
BRINSCOMBE PORT
BRINSCOMBE
STROUD
GLOS
GL5 2QG

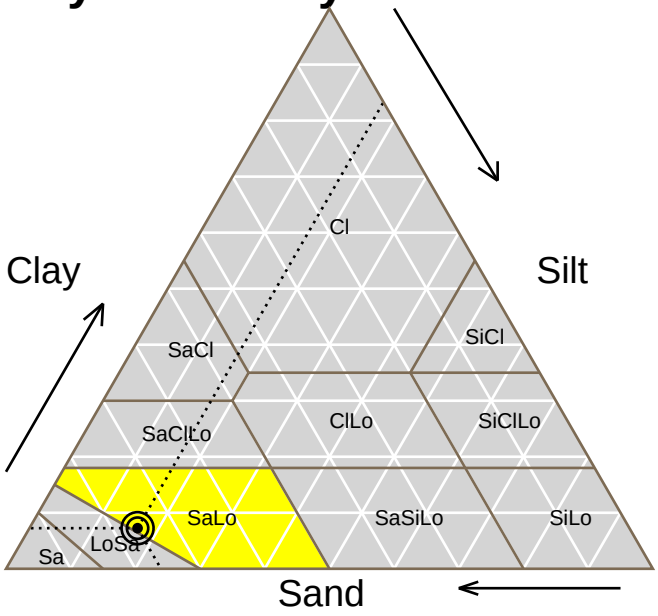
Sample Ref MDS 12 TOPSOIL H2

Date Received 30/07/2019 (Date Issued: 05/08/2019)

Sample No E337879/05

Crop

Physical Analysis



Analysis	Result (%)
Sand	76.04
Silt	16.71
Clay	7.25
Very Fine Sand	4.05
Fine Sand	31.95
Medium Sand	33.44
Coarse Sand	6.59
Very Coarse Sand	< 0.01
Stones >2mm	6.70
Soil Type	SaLo Sandy Loam

Property	Assessment
Available Water	Low to Medium
Drainage Rate	Rapid
Inherent Fertility	Low to Medium
Potential C.E.C.	Low to Medium
Leaching Risk	High to Moderate
Warming Rate	Rapid

Analytical Services
Tel: + 44(0) 1759 305116
Yara UK Limited - Pocklington
Email:ypl.laboratory@yara.com

Analysis Results (SOIL)

Customer
ARCADIS (UK) LIMITED
THE MILL
BRIMSCOMBE PORT
STROUD
GL5 2QG

Distributor
ARCADIS (UK) LTD
THE MILL
BRINSCOMBE PORT
BRINSCOMBE
STROUD
GLOS
GL5 2QG

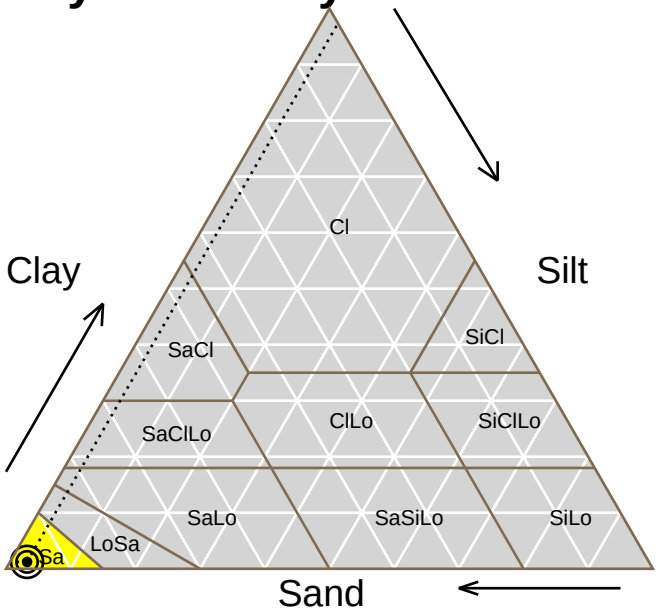
Sample Ref MDS 12 TOPSOIL H3

Date Received 30/07/2019 (Date Issued: 05/08/2019)

Sample No E337879/06

Crop

Physical Analysis



Analysis	Result (%)
Sand	96.13
Silt	2.64
Clay	1.23
Very Fine Sand	0.51
Fine Sand	15.70
Medium Sand	53.81
Coarse Sand	25.96
Very Coarse Sand	0.16
Stones >2mm	5.30
Soil Type	Sa Sand

Property	Assessment
Available Water	Very Low to Low
Drainage Rate	Very Rapid
Inherent Fertility	Low
Potential C.E.C.	Low
Leaching Risk	High
Warming Rate	Rapid

Analytical Services
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Yara UK Limited - Pocklington
Email:ypl.laboratory@yara.com

VOLUME 2, CHAPTER 17, APPENDIX 17B: OFF-SITE DEVELOPMENTS ASSESSMENT

Contents

Tables

Plates

None provided.

Figures

None provided.

1. Soils and Agriculture Off-site Development Assessment

1.1 Introduction

1.1.1 This appendix of **Volume 2** of the **Environmental Statement (ES)** presents an assessment of the soils and agriculture effects arising from the construction and operation of the proposed off-site developments, which include the off-site sports facilities at Leiston, fen meadow compensation sites south of Benhall and east of Halesworth and, if required, the marsh harrier habitat improvement area (Westleton). They are referred to throughout this appendix as the 'off-site developments' or 'the proposed development'.

1.1.2 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 off-site development works and different construction and operational phases are provided in **Chapters 2**–**4** of this volume of the **ES**. A glossary of terms and list of abbreviations used in this chapter is provided in **Volume 1, Appendix 1A** of the **ES**.

1.2 Legislation, policy and guidance

1.2.1 **Volume 1, Appendix 6M** identifies and describes legislation, policy and guidance of relevance to the assessment of the potential soils and agriculture impacts associated with the Sizewell C Project. There is no further legislation, policy and guidance over and above that described in **Volume 1, Appendix 6M** that is deemed relevant to the assessment of effects associated with the off-site development works.

1.3 Methodology

a) Scope of the assessment

1.3.1 The generic Environmental Impact Assessment (EIA) methodology is detailed in **Volume 1**, **Chapter 6**. The full method of assessment for soils and agriculture that has been applied for the Sizewell C Project is in **Volume 1, Appendix 6M**.

1.3.2 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. 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**, **Appendix 6C**.

1.3.3 This section provides specific details of the soils and agriculture screening exercise, as detailed below, methodology applied to the assessment of the proposed off-site development works screened in, and a summary of the general approach to provide appropriate context for the assessment that follows.

1.3.4 Where the proposed off-site development works are considered to have the potential for likely significant effects, these have been screened in for further assessment. The scope of assessment considers the impacts of the construction and operational use of the proposed off-site developments.

b) Environmental screening

1.3.5 An environmental screening exercise was undertaken to identify which of the off-site development works may give rise to environmental effects that could potentially be significant. This concluded that the marsh harrier habitat improvement area west of Westleton should be taken forward to the assessment of likely effects on soils and agriculture.

1.3.6 The sports facilities at Leiston and the fen meadow compensation sites have been screened out of the soils and agriculture assessment as they are not likely to give rise to significant environmental effects.

1.3.7 **Table 1.1** provides a summary of the environmental screening exercise.

Table 1.1: Summary of environmental screening exercise.

Proposed Off-Site Developments.	Summary of Potential Effects.	Screened In or Out of the Assessment.
Sports facilities at Leiston.	The site is currently not in agricultural use.	Screened out.
Fen meadow compensation site adjacent to Benhall.	**Site at Benhall** This site lies south of Benhall and comprises 12 hectare (ha) of improved pasture, lying at approximately 5 metres (m) above ordnance datum (AOD). The River Fromus forms the eastern boundary to the site and a number of ditches are present within the site. A small part of the site in the north west corner is under Entry Level plus Higher Level Stewardship. The land is provisionally mapped as Grade 4. There is no detailed mapping available. The is underlain by geology of the Crag Group (sandstone). This is covered by superficial deposits of alluvium (clay, silt, sand and gravel). Soils are mapped as Fen Peat soils, which are organic and naturally wet.	Screened out.
Fen meadow compensation site adjacent to Halesworth.		

Proposed Off-Site Developments.	Summary of Potential Effects.	Screened In or Out of the Assessment.
	Site at Halesworth This site lies to the east of Halesworth and comprises 4ha of improved pasture. The River Blyth forms the southern boundary to the site and a number of ditches are present within the site. None of the site appears to be under an agri-environment scheme. The land is provisionally mapped as Grade 4. There is no detailed mapping available. The is underlain by geology of the Crag Group (sandstone). This is covered by superficial deposits of alluvium (clay, silt, sand and gravel). Soils are mapped as Fen Peat soils, which are organic and naturally wet. **Conclusion** The sites proposed for fen meadow habitat currently comprise grazing land. During the habitat improvement works, the sites would be temporarily excluded from agricultural use. However, due to the short duration of any works required, the effects are not considered to be significant. Following the completion of works, it is anticipated that grazing of the land would continue, albeit with a possible reduction in grazing density. This is not considered likely to result in a significant effect on existing farming operations.	
Marsh harrier habitat improvement area - west of Westleton.	This site lies to the north-west of Westelton and comprises 54ha of arable land, lying at approximately 10m AOD. The site comprises six fields with a number of ponds lying along field boundaries. None of the site is under an agri-environment scheme. The land is provisionally mapped as Grade 3. There is no detailed mapping available. The is underlain by geology of the Crag Group (sandstone). Parts of the site are covered by superficial deposits. Along the line of Wash Lane Head Deposits are mapped, comprising clay, silt, sand and gravel. In the western part of the site lie deposits of Diamicton (again likely to comprise a wide range of sediment types). Along the line of Yoxford Road lie sands and gravels of the Lowerstoft Formation. Soils are mapped as freely draining slightly acid but base-rich loamy soils. Whilst the majority of the land holding will remain in agricultural use, there will be a cessation of arable production across the land required for the marsh harrier habitat creation resulting in potential temporary effects on the existing farm holding.	Screened in.

c) Study area

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

1.3.9 The marsh harrier habitat improvement area covers approximately 54ha and is located west of Westleton.

1.3.10 In addition, the assessment of impacts on farm viability will take into account the full extent of each affected business (i.e. so the impact can be considered in the context of the entire holding).

d) Assessment scenarios

1.3.11 The assessment of effects on soils and agriculture includes the assessment of the entire construction, operation and removal and reinstatement phases of the proposed development, rather than specific assessment years. These effects would only occur during the construction period of the main development site. Following the constructon of the main development site, the marsh harrier habitat improvement area would be returned to agricultural use.

e) Assessment criteria

1.3.12 As described in **Volume 1, Chapter 6**, 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 magnitude of impacts in order to classify effects.

1.3.13 Assessment criteria specific to soils and agriculture assessment are provided in **Volume 1, Appendix 6M**.

f) Assessment methodology

1.3.14 **Volume 1, Appendix 6M**, sets out the detailed methodology.

1.3.15 The principal agricultural and related resources are characterised by the quality of the agricultural land and items of fixed farm and farm-related capital, as well as other items of capital associated with diversified activities on farms.

1.3.16 Information on the nature of the soils, the quality of the land and land use has been gained from a detailed desk study undertaken using available information.

g) Assumptions and limitations

1.3.17 The following assumption has been made in this assessment:

- As the potential impacts are temporary no Agricultural Land Classification (ALC)[1] surveys have been undertaken to confirm the land grades at these sites. Where the provisional mapping shows Grade 3 land, it has been assumed there is the potential for best and most versatile (BMV) land to be present (i.e. land grades 1, 2 and 3a).

1.4 Assessment of effects

1.4.1 As identified in **section 1.3 b),** the marsh harrier habitat improvement area is considered to have the potential to result in significant environmental effects and has therefore been assessed in further detail. The off-site sports facilities and the fen meadow compensation sites are considered not likely to result in significant environmental effects during their construction or operation.

1.4.2 Works to establish the temporary marsh harrier habitat improvement area would comprise:

- Cessation of arable cultivation, other than for any annually cultivated 'game strips' under a land 'set-aside' type approach.
- One-off sowing of a coarse grassland mix to produce rough grassland with annual sowing of broad game strips to attract flocks of small birds and increase small mammal numbers.

1.4.3 At the end of the construction phase, the areas would be returned to agricultural use.

1.4.4 **Table 1.2** summarises the outcome of the assessment of the likely effects of the marsh harrier habitat improvement area screened into the assessment. The baseline environment is described, any environmental design and embedded mitigation is outlined, and a summary of the likely effects, before and after any additional mitigation and monitoring (if required) is provided.

[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.

Table 1.2: Summary of the assessment of effects for off-site developments.

Baseline Environment.	Environmental Design and Embedded Mitigation.	Assessment of Effects.	Additional Mitigation and Monitoring.	Residual Effect.
Marsh harrier habitat improvement area west of Westleton.				
Current baseline • 54ha of arable land under a single ownership (comprising approx. 14.7% of the landholding). • Provisionally mapped as Grade 3. • No land under agri-environment scheme. • Freely draining slightly acid soils. • **High** sensitivity in relation to ALC grade. • **Low** sensitivity in relation to landholding. **Future baseline** • In the absence of the proposed development it is considered unlikely there would be changes to the current baseline conditions.	Establishment and enhancement of habitats would be undertaken to minimise restrictions on future agricultural use. Any soil disturbance required would replicate existing agricultural operations (e.g. ploughing). All land returned to current use at the end of the construction phase.	No impact on BMV land as soils are not being stripped or built over (i.e. no loss of BMV land). **Medium** magnitude impact on the landholding (due to proportion of land required) which would be a **minor adverse** effect and **not significant.**	Whilst the impact is not considered to be significant, further consultation with the land owner will be undertaken to reduce the impacts on the farm business, as far as practicable.	**Minor adverse** effect and **not significant**.

References

No references included.

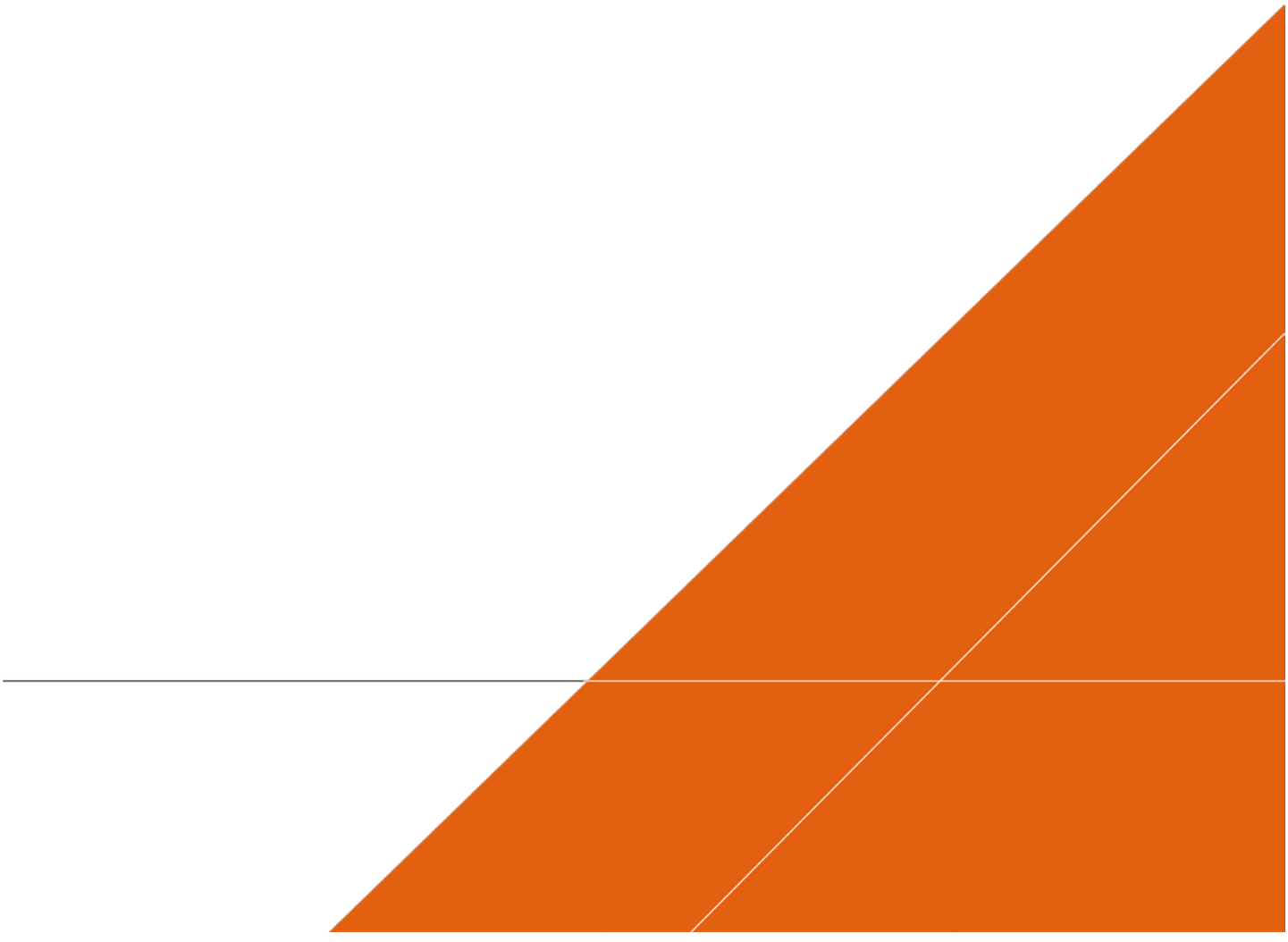
VOLUME 2, CHAPTER 17, APPENDIX 17C: OUTLINE SOIL MANAGEMENT PLAN

ARCADIS Design & Consultancy for natural and built assets

OUTLINE SOIL MANAGEMENT PLAN

Sizewell C

January 2020



CONTENTS

1 INTRODUCTION

1.1 Background

1.1.1 The purpose of the Soil Management Plan (SMP) is to provide details of the methodology, control measures and monitoring programme for the site preparation and reinstatement work phases of the Sizewell C Project. This document provides the over-arching principles that are applicable to all schemes that form part of the Sizewell C Project with regard to soil management. This includes all land within the site boundary where soils will be disturbed by the construction works.

1.1.2 The SMP will be used as a tool by SZC Co. and the appointed Agent(s), Contractor(s) or sub-contractor(s) acting on their behalf, as a method to control, record and audit activities relating to soil conditions and soil quality for future re-use. It includes requirements and standards for any imported topsoil and subsoil required.

1.1.3 The SMP draws on key guidance documents as follows:

- Defra Construction Code of Practice for the sustainable use of soils on construction sites
- MAFF Good Practice Guide for Soil Handling
- BS 3882:2015 – Specification for topsoil
- BS 8601:2013 – Specification for subsoil and requirements for use

1.1.4 This document is an outline SMP. Prior to any soil stripping works commencing this outline SMP will be updated by the Contractor and detailed Soil Resources Plans (SRP) will be produced for each part of the Sizewell C Project to provide the required detail (as highlighted throughout this document). These SRPs will form part of the SMP.

1.1.5 The SRPs will be produced by the Contractor to include:

- Maps of the soil handling units for topsoil, upper subsoil and lower subsoil and the soil sampling points;
- Maps showing the existing (pre-construction) ALC grades;
- Maps showing the areas to be stripped and those to be left *in situ*;
- Details of proposed vegetation clearance/management prior to soil stripping;
- Maps with supporting text showing the proposed final landform, land uses and target ALC grades, where applicable;
- The volumes of the different types of soil resources that will be stripped, stored and re-used;
- The proposed location, content and volumes of stockpiles;
- Any changes to methods to be used (including machinery);
- A target specification for the restored soils (i.e. depth of soil profile, horizon thickness, textures, available soil nutrients where applicable, etc.); and

- The person(s) responsible for supervising the soil management.

1.1.6 The final SMP and each SRP will be produced by the works contractor prior to any soil stripping commencing for review, comment and acceptance by SZC CO.

2 ROLES AND RESPONSIBILITIES

2.1.1 The implementation and audit of the SMP will require certain key responsibilities to be assigned to defined roles. EDF and the works contractor will have in place individuals with sufficient training and expertise in assessing soils, soil conditions and soil handling operations to ensure the measures outlined herein can be implemented, supervised and monitored effectively.

2.1.2 In advance of any soil stripping works commencing full details of roles and reporting mechanisms will be set out in each SRP. The two key roles will be the Contractor's Site Environmental Lead and the Contractor's Soil Scientist. Outline requirements for each role in relation to soils are detailed below.

2.2 Contractor's Site Environmental Lead

2.2.1 The Contractors Site Environmental Lead is responsible for planning, over-seeing and carrying out routine inspections of soil management activities to ensure adherence to SMP protocols including:

- Treatment of site vegetation before topsoil stripping;
- Determination of topsoil plasticity status ahead of soil stripping (plastic or non-plastic);
- Soil segregation during stripping and storage according to ownership, soil horizon (topsoil/subsoil), soil type and plasticity status;
- Stockpile and windrow construction, where required;
- Soil tracking from stripping, storage, (reconditioning) to re-use; and
- Re-use of soils (transportation, placement and decompaction).

2.2.2 The Site Environmental Lead, in liaison with the Contractor's Soil Scientist, will be responsible for providing plans and reports on all soil stripping, stockpiling and restoration activities (to be included within the SRP) to SZC CO. including:

- Soil Stripping Plan;
- Soil Stockpile Plan;
- Compilation of data relating to the volume and type of topsoil and subsoil excavated, transported and stockpiled;
- Soil Reconditioning Plan;
- Restoration plans; and
- Report for the Earthworks phase, including supporting drawings, photographs, observations.

2.2.3 These activities will be the responsibility of the Site Environment Lead but may be delegated to individuals with sufficient training and expertise where required.

2.3 The Contractor's Soil Scientist

2.3.1 The Contractor's Soil Scientist is responsible for the provision of expert and technical soils advice and supervision throughout the earthworks and the subsequent site restoration activities. The role includes liaison with the Site Environmental Lead and review and approval of method statements and risk assessments with regards to soil management.

2.3.2 The Soil Scientist is responsible for training key site staff in identification of topsoil and subsoil resources which are suitable for re-use so that accurate segregation of materials can be achieved. The Soil Scientist will also provide training on the assessment of soil plasticity status based on the field technique provided in Annex G.

2.3.3 The Soil Scientist will conduct targeted supervision, site inspections and monitoring of stripping works based on observations made by the Site Environmental Lead during key operations, including, but not limited to:

- treatment of existing vegetation;
- soil stripping and temporary storage;
- soil reconditioning (where necessary);
- overburden treatment;
- subsoil placement;
- topsoil placement;
- decompaction measures;
- surface cultivations; and
- soil amelioration.

2.3.4 Where necessary and particularly during the replacement of soils and overburden for restoration, the Soil Scientist will excavate inspection pits at representative locations in order to check important in-situ pedological soil properties (e.g. compaction levels, soil structure, anaerobism, drainage characteristics, soil depths).

2.3.5 The Soil Scientist will provide Inspection Reports (including photographs and plans) for each site visit and will confirm that soil conditions are compliant with this SMP / landscape design or identify non-compliances that need to be addressed.

3 BASELINE CONDITIONS

3.1.1 Agricultural Land Classification (ALC) surveys have been undertaken for all schemes. ALC maps are provided with each relevant Environmental Statement chapter, with the associated auger logs for each location also provided. These have been collated and are presented in **Annex A**.

3.1.2 This information will be used to develop each scheme-specific SRP, enabling stripping depths and stockpile volumes to be detailed.

4 CALCULATION OF SOIL VOLUMES

4.1.1 The SRPs will detail soil stripping, storage and restoration plans based on soil volume calculations using the data presented from the baseline surveys (see above).

4.1.2 The clear tracking of actual moved and stockpiled volumes of both topsoil and subsoil will be undertaken to allow restoration re-use plans to be revised based on actual volumes (including required actions in relation to the overall topsoil / subsoil balance).

4.1.3 Clear segregation and storage of topsoil and subsoil resources will be critical to maximizing re-use. All necessary topsoil, subsoil and underlying strata will be stripped and stockpiled separately.

4.1.4 If, once detailed survey information is available, there is a requirement to import topsoil and/or subsoil materials it will be confirmed that these conform to the specifications as set out in the British Standards for topsoil and subsoil (referenced in Section 1.3).

5 SOIL PROTECTION STRATEGY

5.1 Introduction

5.1.1 Since soil is a vulnerable and non-renewable resource, care must be taken throughout all handling, transporting and stockpiling activities so that the soil resources of the site are protected and conserved. Many construction activities have the potential to damage soils. The purpose of this section of the outline SMP is to describe how the management of soils will be controlled and to specify how soils will be protected and their quality conserved throughout all stages of the work.

5.1.2 Failure to protect soils during disturbance can lead to their degradation with consequential environmental impacts both on-site and off-site, such as: (a) soil erosion, (b) loss of soil organic matter; leading to loss of nutrients and a decline in soil fertility, (c) soil compaction leading to loss of soil structure and reduced permeability to water (leading to waterlogging) and restricted aeration and rooting potential, and (d) loss of soil biological activity.

5.1.3 Degradation of soils can lead to adverse impacts on the landscape, including: (a) alteration to the hydrology of the site caused by changes in surface runoff, (b) increased sediment loading to adjacent watercourses, (c) poor re-establishment of vegetation, and (d) visual impact of slope failure or soil erosion leading to bare soil surfaces.

5.1.4 Measures are provided in this outline SMP to manage how soils on site will be stripped, handled and stored appropriately so that they can be re-used in restoration of the site.

5.2 Outline Soil Protection Measures

5.2.1 This outline SMP describes procedures for soil stripping, handling, transporting, storing, and restoration of soils to maintain, as far as practicable, their soil quality and viability.

5.2.2 There will be a number of control measures at each stage of the works. A summary of these measures is outlined in bullet form below and described in more detail in the following sections.

Early soil protection measures

- Measures for in-situ soil protection during early site clearance activities

Soil recovery and storage (stockpiling)

- In-situ soil protection ahead of stripping;
- Pre-treatment of existing vegetation;
- Measures for handling and stockpiling;
- Measures to ensure correct segregation of different topsoil and subsoil resources
- Measures for separate storage of different soil types; and
- Method and locations of stockpiling.

Soil reconditioning (for use where required)

- Measures to recondition wet and plastic topsoil and subsoil resources before re-use
- Measures to ensure correct segregation of different topsoil and subsoil resources; measures for handling and to optimise soil drying and re-aeration
- Methods to monitor the process

Soil restoration methods

- Soil prescriptions for each different land use; soil handling/replacement methods; and in situ soil treatments for each different land use

Monitoring

- Monitoring programme; soil assessment procedures for (a) soil stripping and storage (b) soil reconditioning and (c) restoration activities
- Acceptability criteria for soil storage, reconditioning and soil replacement activities
- Failures of acceptability criteria and corrective actions

Quality control and auditing measures

- Quality control, auditing procedures and plans; criteria for cessation of works
- Non-compliances and corrective actions
- Use of tool box talks for staff training

5.3 Wet Weather Working and Cessation of Works

5.3.1 There is no requirement for the cessation of earthworks identified under this outline SMP. However adverse weather can cause difficult and/or dangerous

working conditions and therefore may warrant a cessation of works. Criteria for the cessation of works will be agreed with relevant stakeholders in advance of any site operations commencing.

5.4 Use of Tool Box Talks

5.4.1 Regular Tool Box talks will be used so that all site staff are aware of the SMP and applicable soil handling and soil protection procedures. The Tool Box Talks will be site-specific, discussing soil conditions and approaches to soil handling at the site.

5.4.2 Examples of tool box talks to be used are listed in Annex I.

6 SOIL MANAGEMENT MEASURES

6. 01 Outlined below are further details of soil management measures.

6.1 Early Soil Protection Measures

6.1.1 During the earthworks it is essential that soils are adequately protected. Plant and vehicles servicing these activities will be managed so that they do not traffic across in situ soils. Demarcated access routes will be provided to provide single points of access to soil strip and storage areas to minimise compaction of underlying soils.

6.1.2 There will be no vehicle access to areas of the site outside the marked access routes (except for light vehicles for site checks and vehicles directly involved with topsoil / subsoil / overburden stripping and transportation). The access plan will be prepared and added to the SRP prior to start of works by the Contractor and issued to SZC CO. for acceptance.

6.1.3 There will be no lay-down of materials except for those materials required for specific on-going construction activities either within the route corridors or anywhere outside designated storage areas. Subject to ground conditions, materials can be temporarily stored on topsoil if it is considered this will not be detrimental to soil quality.

6.2 Soil Recovery and Storage (Stockpiling)

6.2.1 Before any soil stripping activities take place, a soil strip phasing plan will be prepared by the Contractor, added to the SRP and issued to SZC CO. for acceptance.

6.2.2 The plan will provide timescales and sequencing of topsoil and subsoil stripping and proposed haul routes. The earthworks will be phased to ensure that topsoil is stripped in each part of the site ahead of subsoil materials and that all soils are stripped from a designated area prior to bulk excavation and earthworks activities within that area.

6.3 Soil Segregation

6.3.1 To ensure that the correct topsoil and subsoil depths are stripped and stockpiled tool box talks will be used to provide the required information and works will be supervised by suitably qualified personnel. The sources of all soil stockpiled will be logged/tracked and will be subject to the auditing process described in the SMP.

6.3.2 Separate stockpiles will be created for different types of topsoil and subsoil. Documentation and physical control measures (such as signing of stockpiles) will be put in place to prevent accidental mixing and to so that soils are segregated according to source location. Where there are spatial constraints it may be required to stockpile soils up against each other, with physical separation being achieved by means of a geomembrane barrier / marker layer to so that no mixing occurs.

6.3.3 All soils to be re-used for landscape restoration will be free from significant quantities of foreign matter or other materials which would render the soils unsuitable for re-use.

6.4 Pre-treatment of Existing Vegetation

6.4.1 It is good practice to reduce the quantity of vegetation entering the storage stockpiles to minimise the formation of anaerobic conditions during storage. As such, in advance of soil stripping, the topsoil will be cleared of surface vegetation and arisings removed by a method suited to the vegetation type present. The effectiveness of these operations will be assessed by suitably qualified personnel.

6.5 Methods of Soil Stripping

6.5.1 Soil will be stripped using a tracked dozer following the methodology set out in **Annex B**. Dump trucks will be used to transport the soils to their allocated storage location. All procedures will be planned to involve minimum tracking to minimise compaction. Access for dump trucks will be via dedicated marked routes to prevent compaction of non-stripped topsoil and subsoil.

6.5.2 Immediately prior to stripping the soil shall be tested for plasticity, using the methodology presented in **Annex C**.

6.6 Soil Storage

6.6.1 Key issues for soil handling, storage and eventual re-use are soil moisture content and soil consistency (plasticity). Soils that are stripped when plastic will require to be reconditioned before re-use for restoration. During the works, soil plasticity status will be determined in situ prior to stripping (see **Annex C**).

6.6.2 Stockpiling will be undertaken in accordance with the methodology set out in **Annex D**.

6.6.3 The general principles governing stockpile location and stability which will be adhered to are as follows:

- All areas designated as stockpiling areas will be stripped of topsoil and subsoil resources prior to stockpiling;

- Stockpiles will not be positioned within the root or crown spread of trees, or adjacent to ditches, within 10m of watercourses or existing or future excavations;
- Topsoil and subsoil stockpiles will be seeded with a neutral grassland seed mix to maintain slope stability and to prevent erosion or dust generation;
- Grass seeded and maintained stockpiles will have a maximum side slope that is based on geotechnical stability; and
- Topsoil and subsoil stockpiles will be managed and monitored throughout their lifetime to so that can be maintained in relation to stability and integrity.

6.6.4 Measures to manage and treat site runoff and prevent erosion and dust generation during soil stripping and stockpiling works will be set in place through a series of specific control measures. These will be described in the Code of Construction Practice (CoCP). Construction methodologies will be such that appropriate bio-security (disease and pest control) and weed control measures are in place to protect both on-site soils and adjacent land holdings.

6.6.5 When required prior to soil re-use, plastic soils will require reconditioning as set out in **Annex E**. Windrows for soil drying will be no more than 2m in height. Only once the soil moisture content of windrowed soil has reduced sufficiently and the soil is non-plastic in consistency will it be moved to its final stockpile location or final re-use location.

6.7 Stockpile Locations, Treatment Areas and Access Routes

6.7.1 The location of topsoil and subsoil stockpiles will be clearly set out on stockpile plans as part of the SRP and issued to SZC CO. for acceptance. Once agreed, locations will be clearly marked out on the ground.

6.7.2 This will include clear mapping of required access routes to stockpile locations for all phases of the soil stripping, transport and stockpiling activities. As works progress and change location, the access route demarcation and signage will be changed as required in advance.

7 SOIL RESTORATION METHODS

7.1 Introduction

7.1.1 The primary objective of soil restoration is to provide soil profiles suitable for the reinstated land use.

7.1.2 During the placement of topsoil and subsoil resources in their final location the methods outlined above will be followed. This will include, but not be limited to, the implementation of an access and egress plan for vehicles and plant to prevent unnecessary trafficking of restored areas, use of appropriate scale plant, avoidance of double handling and avoidance of mixing topsoil and subsoil.

7.1.3 Soil replacement will be undertaken in accordance with the methodology set out in **Annex F**.

7.1.4 During restoration works, measures to manage and treat site runoff, and prevent erosion and dust generation will also be set in place through a series of specific

control measures. These requirements will be set out in the detailed CoCP. Specific issues will be around biosecurity (disease and pest control) and weed control to protect both on-site soils and adjacent land holdings during restoration.

7.1.5 These activities are detailed further in the following sections.

7.2 Placement and in situ Treatment of Soil Materials

7.2.1 Prior to restoration activities taking place, topsoil will have been stored in stockpiles for extended periods. To confirm continuing suitability of stockpiled soils for restoration, they will be visually inspected, and assessments carried out before their re-use (see Section 8 Monitoring). If any soil is found to be plastic or display excessive anaerobic conditions the materials will be reconditioned as detailed above. It will be the responsibility of the contractor to assess soil conditions in each stockpile and to recommend appropriate pre-treatment prior to soil placement should it be required.

7.2.2 During topsoil and subsoil placement there are two fundamental requirements: (a) to replace and spread out the necessary combination of topsoil and/or subsoil to re-create the soil profile and (b) to ensure careful handling and re-placement of soils, avoiding compaction and any unnecessary damage to soil structure. The following procedure (which is further detailed in the Defra Construction Code of Practice) is designed so that these requirements are met.

7.2.3 The SRP will clearly set out the topsoil and subsoil thickness in undisturbed soils and these thicknesses will be replicated in the restored soil profiles. Acceptability criteria in terms of soil chemical characteristics will also be clearly set out. This is particularly important where soils are to be restored for habitat creation requirements.

7.2.4 After the placement of each soil layer (overburden, topsoil and/or subsoil) it is essential that it is mechanically cultivated using appropriate tillage equipment to loosen/break up compaction and restore soil structure. To be fully effective, these cultivations will be carried out when the soils are dry and friable. Otherwise the cultivation tool/tine merely cuts and smears the soil rather than lifting, fracturing and loosening it.

7.2.5 Prior to the placement of stockpiled subsoil and topsoil, the re-profiled surface will be overlain with overburden material to create the required landform. After placement of overburden, the area will be deep ripped prior to placement of stockpiled subsoil and topsoil. This operation will be checked by suitably qualified personnel to ensure satisfactory decompaction has been achieved.

7.2.6 The various topsoil and/or subsoil materials will be placed in layers over the ripped overburden using suitable machinery. The topsoil and subsoil will be checked by suitably qualified personnel to ensure compliance with the appropriate parameters at this stage (soil type, soil depths and stoniness). Once the soil profiles have been formed, the topsoil and subsoil will be thoroughly decompacted, loosened and prepared using land restoration/agricultural machinery to ensure they meet soil structure and aeration criteria.

7.2.7 Subsoil cultivation is scheduled after the topsoil is placed to allow the subsoil to be decompacted without risk of re-compaction during topsoil spreading. This approach will also 'key in' the topsoil with the subsoil to produce a soil profile that displays continuity between each layer.

8 MONITORING

8.1 Introduction

8.1.1 So that soil quality is maintained throughout the works, key stages will be monitored by appropriately trained and experienced personnel.

8.2 Monitoring Programme

8.2.1 The monitoring programme shall incorporate the following:

Soil Recovery

- The effectiveness of vegetation pre-treatment in advance of soil stripping
- An assessment of soil plasticity ahead of soil stripping. This will determine whether a soil reconditioning stage is needed after storage and before re-use

Storage

- Assessment of soil stockpiles to ensure soil quality is maintained during storage and to determine reconditioning requirements

Reconditioning

- The effectiveness and progress of the soil reconditioning process

Soil replacement

- Key stages of the soil placement and decompaction/cultivation sequence to check correct soil spreading and effectiveness of tillage operations
- An assessment of the acceptability of the replacement soil profiles for the restoration design

8.3 Personnel

8.3.1 The monitoring tasks shall be conducted by specialist personnel with appropriate experience and training for their role.

8.4 Documentation

8.4.1 Annex G presents a checklist of the information which will be recorded during stockpile or windrow creation and following completion. Annex H presents a list of the data to be included in soil stripping and stockpiling documentation.

8.4.2 Inspection processes, checklists and acceptability criteria will be developed, based on the above, by the Contractor and issued to SZC CO. for acceptance prior to any works commencing. Documentation of the monitoring undertaken, including clearly marked up plans, will be maintained and made available by SZC CO.

8.5 Reporting of Findings

8.5.1 The findings of all examinations and assessments will be recorded and held by the Contractor for record keeping and to enable actioning of necessary corrective actions.

8.6 Failures of Acceptability Criteria and Corrective Actions

8.6.1 Where the soils are found to be non-compliant in any respect, appropriate means of remediation will be proposed by the appointed Contractor for acceptance by SZC CO. Once the affected area has been treated, it will be reassessed before sign-off.

9 AUDITING

9.1.1 An audit checklist will be developed based on the checklist presented in Annex I by the Contractor and issued to SZC CO. for acceptance. This will be updated in advance of works commencing to identify key dates and responsible persons. This will then be used during the works to ensure all checks have been undertaken and required records completed.

APPENDIX A

ALC Maps and auger logs

NOTES

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

KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY
- DEMARCATION LINE

PROVISIONAL AGRICULTURAL LAND CLASSIFICATION (ALC)

- GRADE 1
- GRADE 2
- GRADE 3
- GRADE 4
- GRADE 5
- NON AGRICULTURAL
- URBAN

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
PROVISIONAL ALC MAPPING

DRAWING NO:
FIGURE 17.2

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17.3.3

17.3.2

17.3.5

17.3.4

17.3.6

17.3.7

Theberton

Leiston

Sizewell

Dunwich Forest

Minsmere Haven

NOTES

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KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY
- DEMARCATION LINE

MAPPING OF SURVEY POINTS

- GRADE 2
- GRADE 3A
- GRADE 3B
- GRADE 4

AGRICULTURAL LAND CLASS (ALC)

- GRADE 1
- GRADE 2
- GRADE 3A
- GRADE 3B
- GRADE 4
- NOT SURVEYED
- OTHER

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.1

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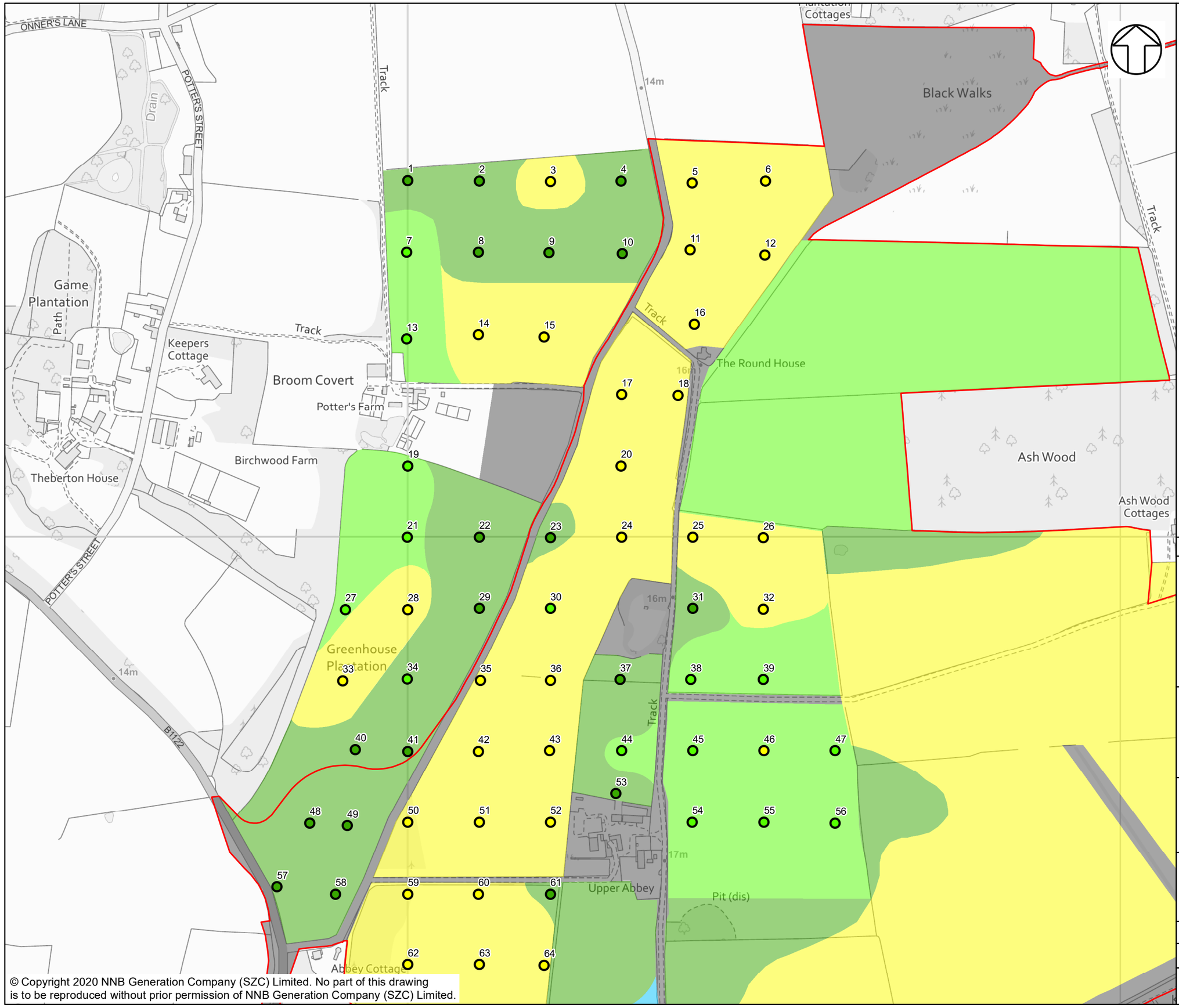

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KEY

SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY

MAPPING OF SURVEY POINTS

- GRADE 3A
- GRADE 3B
- GRADE 4

AGRICULTURAL LAND CLASS (ALC)

- GRADE 2
- GRADE 3A
- GRADE 3B
- GRADE 4
- OTHER

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.2

DATE:	DRAWN:	SCALE :
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SCALE BAR
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Dovehill Plantation
Sandypytle Plantation
Lower Abbey Farm
The Grove
Chapel (remains of)
Ash Wood
Ash Wood Cottages
Stonewall Belt
Walk Barn
Dunwich Forest
Track
Drain
FB

NOTES

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KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY

AGRICULTURAL LAND CLASS (ALC)

- GRADE 3A
- GRADE 3B
- GRADE 4
- NOT SURVEYED
- OTHER

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.3

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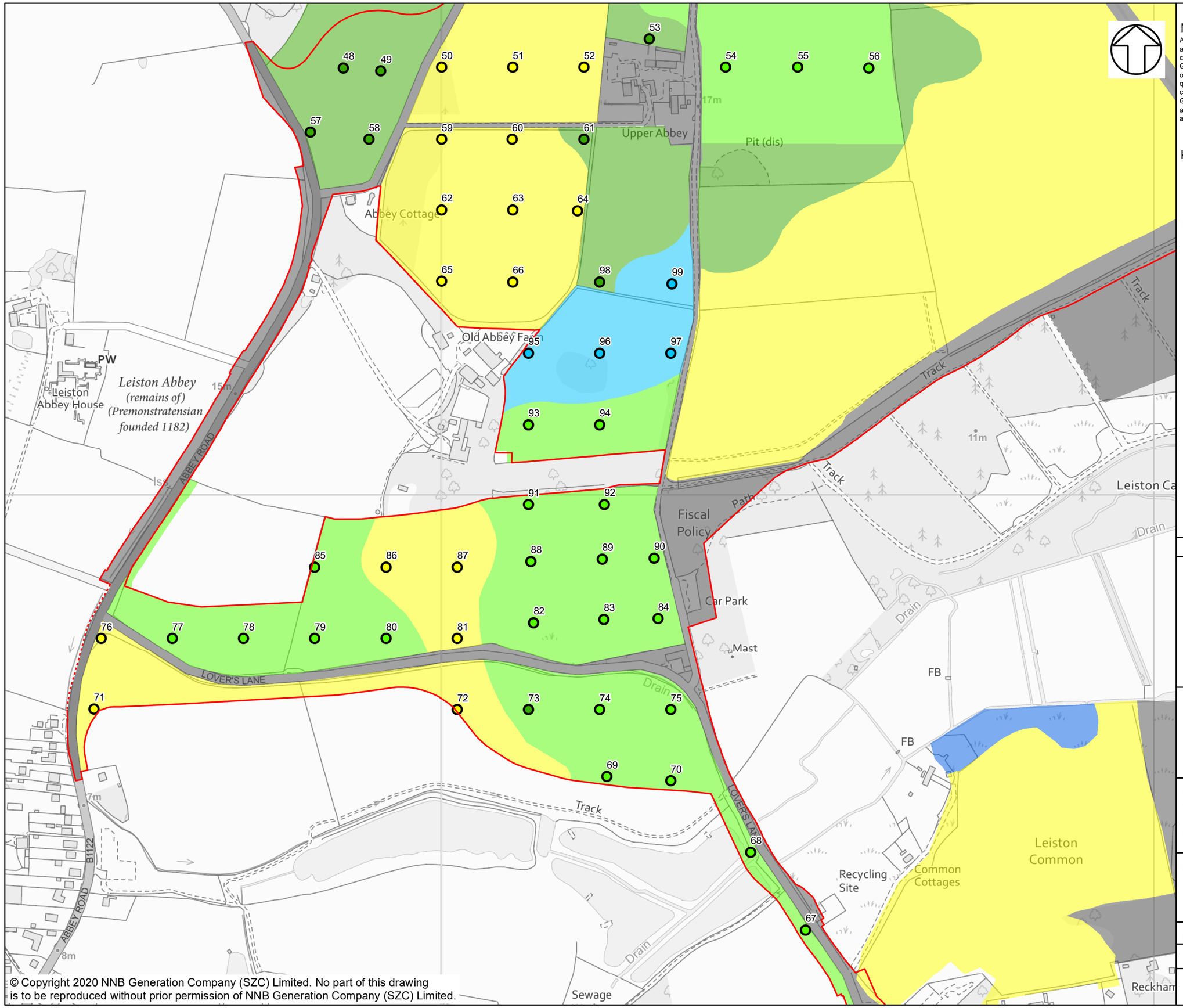

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KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY
- DEMARCATION LINE

MAPPING OF SURVEY POINTS

- GRADE 2
- GRADE 3A
- GRADE 3B
- GRADE 4

AGRICULTURAL LAND CLASS (ALC)

- GRADE 1
- GRADE 2
- GRADE 3A
- GRADE 3B
- GRADE 4
- OTHER

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.4

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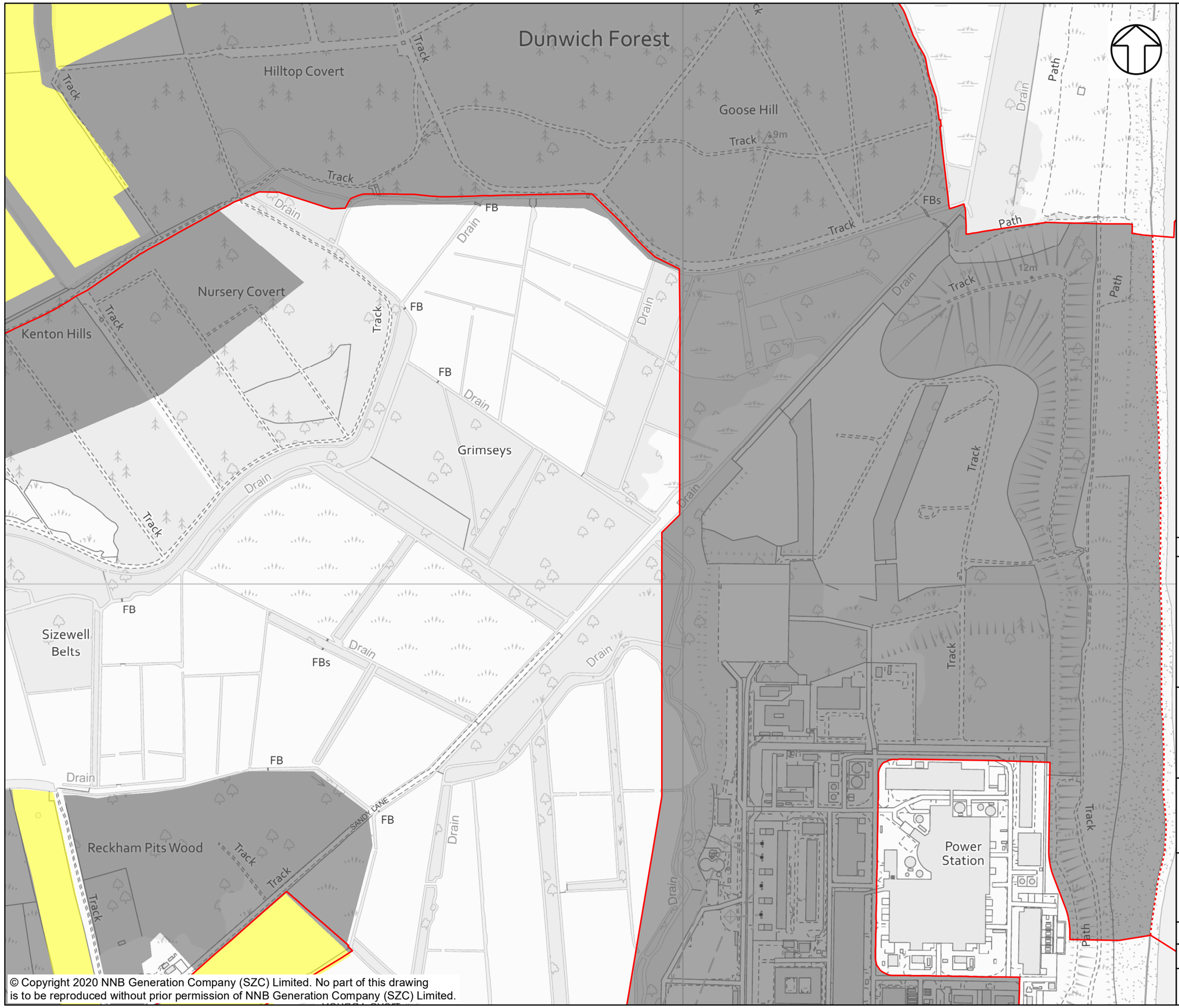

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KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY
- DEMARCATION LINE

AGRICULTURAL LAND CLASS (ALC)

- GRADE 4
- OTHER

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.5

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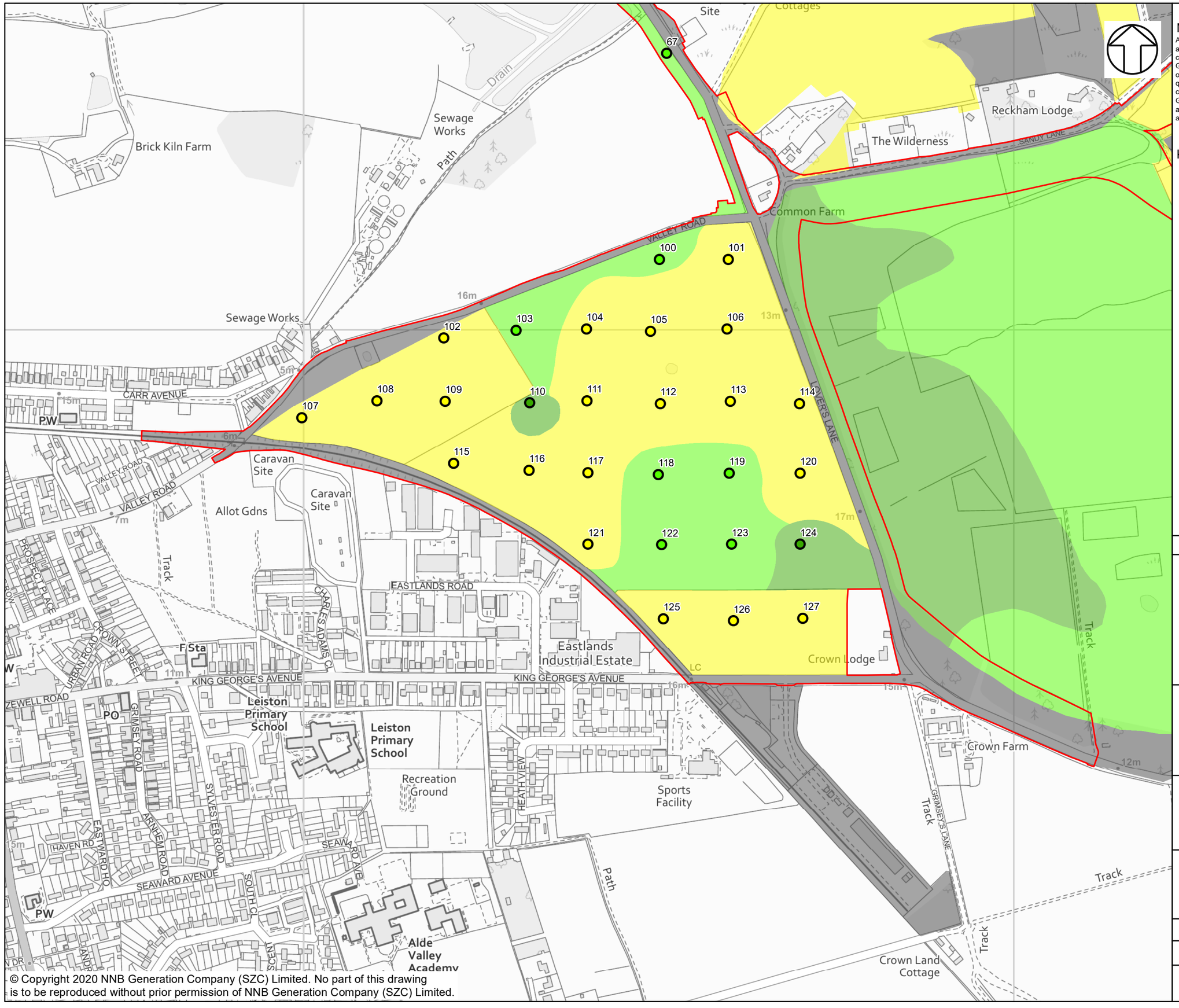

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KEY

SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY

MAPPING OF SURVEY POINTS

- GRADE 3A
- GRADE 3B
- GRADE 4

AGRICULTURAL LAND CLASS (ALC)

- GRADE 3A
- GRADE 3B
- GRADE 4
- OTHER

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
ENVIRONMENTAL STATEMENT
VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.6

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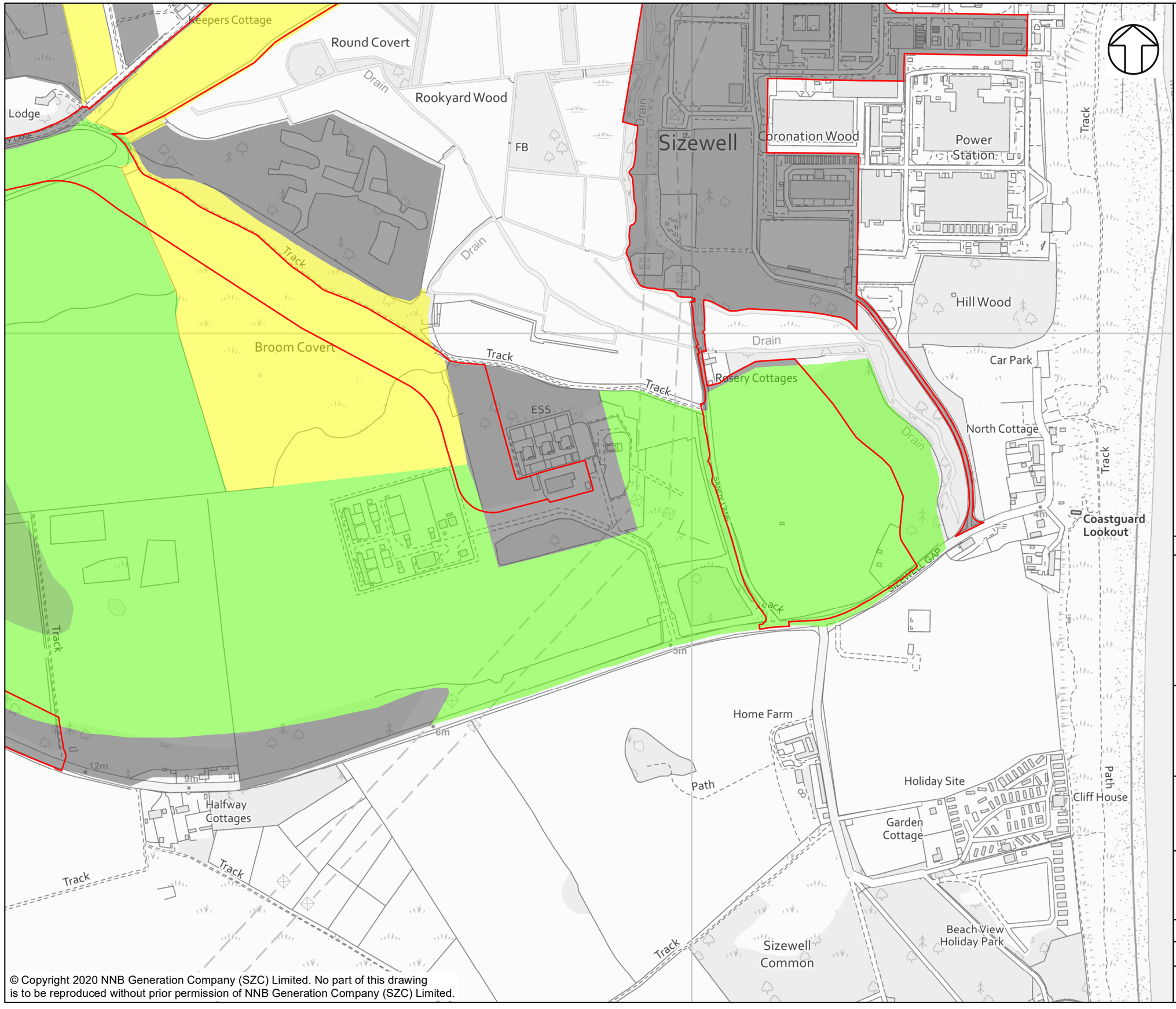

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KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY

AGRICULTURAL LAND CLASS (ALC)

- GRADE 3A
- GRADE 3B
- GRADE 4
- OTHER

NOT PROTECTIVELY MARKED

DOCUMENT:
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VOLUME 2
CHAPTER 17
SOILS AND AGRICULTURE

DRAWING TITLE:
MAIN DEVELOPMENT SITE
DETAILED ALC MAPPING

DRAWING NO:
FIGURE 17.3.7

DATE:	DRAWN:	SCALE :
JAN2020	M.S.	1:5,000 @A3

SCALE BAR

0 50 100 150 200 250 M

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
1	TM	45000	65501	13	1	W	CER	0	25	25	75YR32						MSL	5	HR		N			-5.27	-15.81	3a	I	1	3a	Drought	1>2,0>6
								25	50	25	75YR54						MCL	2	HR	M	N										
								50	70	20	75YR54						MSL	2	HR	M	N										
								70	90	20							MSL	20	HR	M											STONES
								90	120								IMP			P										
2	TM	45100	65500	14	0		CER	0	25	25	75YR32						MSL	8	HR		VS			14.67	-18.55	3a	I	1	3a	Drought	
								25	50	25	75YR43						MSL	5	HR	M											
								50	70	20	75YR54						HCL	2	HR	M											
								70	120	50	75YR56						HCL	20	CH	M											Large chalk stone at 100cm
3	TM	45200	65499	13	4	N	CER	0	20	20	75YR43						HCL	10	HR		S			-53.02	-49.055	4	III	3b	4	Drought	2>2,0>6
								20	45	25	10YR52	CM	10YR58	CM	5Y42	Y	HCL	5	CH	P	M		Y								Located in depression/old pit
								45	55	10	5YR54						MSL	2	CH	M	M										
								55																							Large stone/field drain
4	TM	45299	65500	14	0		CER	0	25	25	75YR32						MSL	5	HR		N			18.51	-13.85	3a	I	1	3a	Drought	1>2,0>6
								25	70	45	75YR54						HCL	2	HR	M	N										
								70	100	30	75YR66						HCL	20	HR	M	N										
								100	120	20	75YR56						MSL	2	HR	M	N										
5	TM	45399	65497	13	1	SE	SBT	0	25	25	75YR32						MS	10	HR		N			-71.895	-68.41	4	I	1*	4	Drought	2>2,0>6
								25	55	30	75YR54						MS	2	HR	M	N										
								55	75	20							MS	20	HR	M											STONES
								75	120								IMP			P										
6	TM	45502	65500	12	1	SW	SBT	0	25	25	75YR32						MS	5	HR		N			-70.52	-67.035	4	I	1*	4	Drought	1>2,0>6
								25	55	30	75YR54						MS	2	HR	M	N										
								55	75	20							MS	20	HR	M											STONES
								75	120								IMP			P										
7	TM	44998	65400	13	2	W	CER	0	30	30	75YR32						LMS	2	HR		N			-15.91	-44.5	3b	I	1*	3b	Drought	0>2
								30	60	30	75YR54						LMS	2	HR	M	N										
								60	100	40	75YR56						MCL	2	HR	M	N										
								100	120	20	75YR74						MS	0		M	V										Weathered limestone at depth
8	TM	45099	65400	13	3	S	CER	0	30	30	75YR32						SCL	10	HR		S			13.625	-18.15	3a	I	1	3a	Drought	2>2,0>6
								30	45	15	75YR33						SCL	8	HR	M	S										
								45	100	55	75YR44						MSL	5	HR	M	S										
								100	120	20	75YR66						MS	0		M	S										
9	TM	45198	65399	15	0		CER	0	25	25	75YR32						MSL	8	HR		N			14.6375	-18.975	3a	I	1	3a	Drought	2>2,0>6
								25	45	20	75YR44						MSL	5	HR	M	N										
								45	75	30	75YR56						HCL	5	HR	M	N										
								75	120	45	75YR56						HCL	20	CH	M	M										
10	TM	45301	65398	15	1	NE	CER	0	25	25	75YR32						MSL	5	HR		N			9.455	-27.57	3a	I	1	3a	Drought	0>2
								25	45	20	75YR44						LMS	2	HR	M	N										

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								45	75	30	75YR56						HCL	2	HR	M	N									
								75	120	45	75YR56						MSL	20	CH	M	M									
11	TM	45396	65403	13	1	NE	SBT	0	25	25	75YR32						MS	5	HR		N			-76.265	-72.295	4	I	1*	4	Drought	1>2,0>6
								25	50	25	75YR44						MS	2	HR	M	N									
								50	60	10	75YR53						MS	2	HR	M	N									
								60	120								IMP			P										Sandstone
12	TM	45501	65396	12	0		SBT	0	25	25	75YR32						MS	5	HR		N			-51.535	-64.415	4	I	1*	4	Drought	0>2
								25	55	30	75YR43						MS	2	HR	M	N									
								55	90	35	75YR33						MS	2	HR	M	N									Buried topsoil?
								90	110	20	75YR54						MS	0		M	N									or CS
								110	120								IMP			P										Sandstone
13	TM	44998	65278	13	1	W	FLW	0	25	25	75YR32						LMS	10	HR		N			-0.8675	-37.375	3b	I	1*	3b	Drought	1>2,0>6 locally greater stone%
								25	40	15	75YR44						LMS	5	HR	M	N									Close to farm and headland
								40	55	15	75YR56						HCL	5	HR	M	N									Used for vehicle turning/parking
								55	90	35	75YR56						MSL	2	HR	M	N									Compacted soil
								90	110	20	75YR56						HCL	2	HR	M	N									
								110	120	10	75YR56						LMS	2	HR	M	N									
14	TM	45099	65284	15	0		FLW	0	25	25	75YR32						LMS	2	HR		N			-40.59	-59.2	4	I	1*	4	Drought	Game cover vegetation?
								25	40	15	75YR44						LMS	2	HR	M	N									
								40	120	80	75YR54						MS	2	HR	M	N									
15	TM	45191	65281	16	0		FLW	0	25	25	75YR32						LMS	2	HR		N			-40.59	-59.2	4	I	1*	4	Drought	Game cover vegetation?
								25	40	15	75YR44						LMS	2	HR	M	N									
								40	120	80	75YR54						MS	2	HR	M	N									
16	TM	45402	65299	15	0		SBT	0	25	25	75YR43						LMS	10	HR		N			-65.085	-61.6	4	I	1*	4	Drought	3>2,1>6
								25	40	15	75YR44						LMS	2	HR	M	N									
								40	75	35	75YR56						MS	2	HR	M	N									
								75	120								IMP			P										Sandstone
17	TM	45300	65200	16	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N									
								45	120	75							IMP														Compaction
18	TM	45379	65199	16	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N									
								45	120	75							IMP														Compaction
19	TM	45000	65100	13	1	NW	CER	0	25	25	75YR32						MSL	10	HR		N			-14.62	-43.07	3b	I	1	3b	Drought	3>2,1>6
								25	35	10	75YR42						MSL	5	HR	M	N									
								35	60	25	75YR54						LMS	2	HR	M	N									
								60	80	20	75YR64						MS	1	HR	M	N									

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								80	90	10	75YR56	FF	10YR61				HCL	2	HR	M	M	C									and CH
								90	120	30	75YR56	CF	10YR61			Y	HCL	2	HR	P	M	C	Y?								and CH
20	TM	45299	65100	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
21	TM	44999	65000	14	1	N	CER	0	25	25	75YR32						MSL	10	HR		N			-32.725	-29.28	3b	III	2	3b	Drought	3>2,1>6
								25	35	10	75YR44						MSL	5	HR	M	N										
								35	55	20	75YR54	CF	75YR62	FF	75YR56	Y	C	2	HR	P	N		Y								
								55	70	15	75YR54	CF	75YR62	FF	75YR56	Y	HCL	20	CH	P	M		Y								
								70	90	20							HCL	40	CH	P											AND FLINTS
								90	120								IMP			P											
22	TM	45100	65000	14	2	NE	CER	0	25	25	75YR32						MSL	10	HR		N			-16.265	-29.7	3a	II	1	3a	Drought	3>2,1>6
								25	40	15	75YR44						MSL	5	HR	M	N										
								40	65	25	75YR56	CF	10YR61			Y	HCL	2	HR	P	N		Y								
								65	90	25	75YR56	CF	10YR61			Y	HCL	10	CH	P	M		Y								
								90	110	20							HCL	20	HR	P											FLINTS
								110	120								IMP			P											
23	TM	45200	64999	16	0		WHT	0	25	25	75yr32						MCL	5	HR		N			3.93	-17.2	3a	II?	2	3a	Drought	
								25	35	10	75yr44						HCL	5	HR	M	N										
								35	45	10	10yr53	CF	10yr61	CF	10yr56	Y	C	5	HR	P	N	F	Y								not deep enough to be SP alone
								45	70	25	10yr53	CF	10yr61	CF	10yr56	Y	SCL	2	HR	M	N		N							
								70	120	50	10yr53	CM	10yr51	CM	10yr56	Y	C	5	CH	P	M	F	Y								
24	TM	45300	65000	17	0		WHT	0	25	25	75yr32						MSL	5	HR		N			-82.2	-80.2	4	I	1	4	Drought	
								25	30	5	75yr44						LMS	5	HR	M	N										
								30	120	90							IMP														Compaction
25	TM	45400	65000	18	1	S	STB	0	25	25	75YR43						LMS	5	HR		N			-49.435	-59.03	4	I	1*	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	65	20	75YR54						MS	2	HR	M?	N										Very compact
								65	85	20	75YR56						MS	2	HR	M	N										
								85	105	20							MS	20	HR	M											STONES
								105	120								IMP			P											
26	TM	45499	64999	15	1	S	STB	0	25	25	75YR32						LMS	2	HR		N			-58.075	-55.6	4	I	1*	4	Drought	
								25	60	35	75YR44						LMS	5	HR	M	N										
								60	80	20							LMS	20	HR	M											STONES
								80	120								IMP			P											
27	TM	44912	64898	12	1	W	CER	0	25	25	75YR32						MSL	5	HR		N			-49.595	-48.81	3b	I	1	3b	Drought	0>2
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	60	15	75YR56						MS	1	HR	M	N										
								60	80	20							MS	20	HR	M	N										FLINTS
								80	120								IMP			P											
28	TM	45000	64898	16	0		CER	0	25	25	75YR42						LMS	5	HR		N			-41.115	-59.92	4	I	1*	4	Drought	0>2
								25	40	15	75YR44						LMS	2	HR	M	N										
								40	120	80	75YR54						MS	1	HR	M	N										

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
29	TM	45100	64900	13	0		CER	0	25	25	75YR32						MSL	5	HR		N			11.075	-18.26	3a	I	1	3a	Drought	1>2,0>6
								25	40	15	75YR44						MSL	2	HR	M	N										
								40	75	35	75YR56,66						MSL	2	HR	M	N										
								75	90	15	75YR56,66						MSL	5	CH	M	M										
								90	110	20							MSL	20	HR	M											
								110	120								IMP			P											
30	TM	45200	64900	16	0		WHT	0	25	25	75yr32						MSL	5	HR		N			-33.985	-23.64	3b	III	2	3b	Drought	
								25	35	10	75yr44						MSL	5	HR	G	N										
								35	75	40	10yr53	CF	10yr61	CF	10yr56	Y	C	2	CH	P	M		Y								
								75	120	45							IMP														Stony?
31	TM	45400	64900	16	1	S	STB	0	25	25	75YR32						MSL	5	HR		N			0.095	-13.85	3a	I	1	3a	Drought	
								25	70	45	75YR54						HCL	2	HR	M	N										
								70	85	15	75YR66						MCL	30	CH	M	N										
								85	105	20							MCL	50	CH	M											STONE
								105	120								IMP			P											
32	TM	45499	64899	14	1	S	STB	0	25	25	75YR32						LMS	5	HR		N			-29.445	-60.42	4	I	1*	4	Drought	
								25	70	45	75YR44						LMS	2	HR	M	N										
								70	95	25	75YR56						MS	2	HR	M	N										
								95	115	20							MSL	20	HR	M											STONES MSL
								115	120								IMP			P											
33	TM	44899	64850	14	2	W	CER	0	25	25	75YR32						MSL	5	HR		N			-60.94	-56.44	4	I	1	4	Drought	0>2
								25	40	15	10YR56						LMS	2	HR	M	N										
								40	60	20							LMS	20	HR	M											STONES
								60	120								IMP			P											
34	TM	44999	64801	16	0		CER	0	25	25	75YR32						MSL	5	HR		N			-38.87	-46.68	3b	I	1	3b	Drought	0>2
								25	60	35	10YR56						LMS	2	HR	M	N										
								60	100	40	10YR66						MS	2	HR	M	N										
								100	120								IMP			P											Sandstone
35	TM	45102	64799	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
36	TM	45200	64799	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
37	TM	45298	64800	17	1	N	SAS	0	30	30	75YR32						MSL	2	HR		N			27.63	-16.08	3a	I	1	3a	Drought	
								30	80	50	75YR54						MSL	2	HR	M	N										
								80	100	20	75YR64						MSL	2	HR	M	N										
								100	120	20	75YR66						MSL	10	CH	M	V										
38	TM	45397	64800	15	1	S	STB	0	25	25	75YR32						MSL	8	HR		N			-15.6	-45.6	3b	I	1	3b	Drought	
								25	50	25	75YR44						LMS	2	HR	M	N										

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
							50	65	15	75YR64						MS	0		M	N										
							65	80	15	75YR54						MSL	0		M	N										
							80	110	30	75YR84						MS	0		M	N										
							110	120	10	75YR83						MSL	0		M	N										
39	TM	45499 64800	12	1	S	STB	0	25	25	75YR32						LMS	2	HR		N			-20.01	-53.32	3b	I	1*	3b	Drought	
							25	90	65	75YR44						LMS	2	HR	M	N										
							90	120	30	75YR56						MCL	2	HR	M	N										
40	TM	44926 64702	16	0		CER	0	25	25	75YR32						MSL	5			N			6.525	-26.05	3a	III	2	3a	Drought	1>2,0>6
							25	50	25	10YR54	CF	10YR62			Y	HCL	2		P	N	F	Y								
							50	75	25	10YR66						HCL	10		M	M										
							75	120	45	10YR66						HCL	30		M	M										
41	TM	45000 64699	17	0		CER	0	25	25	75YR32						MSL	2	HR		N			21.15	-19.3	3a	I	1	3a	Drought	0>2
							25	50	25	75YR44						MSL	2	HR	M	N										
							50	120	70	75YR66						MSL	10	HR	M	N										
42	TM	45099 64699	18	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
							25	45	20	75yr44						LMS	5	HR	G	N										
							45	120	75							IMP														Compaction
43	TM	45199 64700	17	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	
							25	45	20	75yr44						LMS	5	HR	G	N										
							45	120	75							IMP														Compaction
44	TM	45300 64700	15	0		PGR	0	20	20	75YR42						LMS	2	HR		N			-18.24	-41.56	3b	I	1*	3b	Drought	
							20	50	30	75YR44						LMS	2	HR	M	N										
							50	70	20	75YR54						HCL	2	HR	M	N										
							70	90	20	75YR54	F	75YR62	F	75YR56	Y	HCL	2	CH	P	M		Y								
							90	120	30	75YR66						MSL	30	CH	M	V										
45	TM	45400 64700	15	0		CER	0	25	25	75YR32						LMS	2	HR		N			-30.03	-53.32	3b	I	1*	3b	Drought	
							25	70	45	75YR44						LMS	2	HR	M	N										
							70	80	10	75YR56						MSL	2	HR	M	N										
							80	100	20							MSL	20	HR	M											STONES
							110	120								IMP			P										
46	TM	45500 64700	14	0		CER	0	25	25	75YR32						LMS	2	HR					-63.2	-56.2	4	I	1*	4	Drought	
							25	50	25	75YR44						LMS	2	HR	M											
							50	70	20							MS	20	HR	P											Very compact and stony MS
							70	120								IMP			P										
47	TM	45600 64700	13	1	NE	CER	0	25	25	75YR32						LMS	2	HR		N			-30.975	-48	3b	I	1*	3b	Drought	
							25	50	25	75YR44						LMS	2	HR	M	N										
							50	85	35	75YR56						HCL	30	CH	M	N										
							85	105	20							HCL	50	CH	M											STONES

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								105	120								IMP			P											
48	TM	44862	64599	17	0		CER	0	25	25	75YR32						MSL	5	HR		N			18.97	-16.3	3a	I	1	3a	Drought	1>2,0>6
								25	50	25	75YR53						MSL	2	HR	M	N										
								50	120	70	75YR56						HCL	2	HR	M	N	C									
49	TM	44900	64599	17	0		CER	0	25	25	75YR32						MSL	5			N			6.55	-26.05	3a	III	2	3a	Drought	1>2,0>6
								25	50	25	10YR54	CF	10YR62			Y	HCL	2		P	N	F	Y								
								50	70	20	10YR66						HCL	10		M	M										
								70	120	50	10YR66						HCL	30		M	M										
50	TM	45000	64600	18	0		CFW	0	30	30	75yr42						LMS	10	HR		N			-76.8	-74.8	4	I	1*	4	Drought	recently established tree belt.
								30	50								LMS	20	HR	M	N										Stony
								50	120	90							IMP														
51	TM	45100	64600	18	0		WHT	0	25	25	75yr32						LMS	8	HR		N			-74	-72	4	I	1*	4	Drought	pit showed platy structure LMS
								25	45	20	75yr44						LMS	5	HR	G	N										
								45	120	75							IMP														Compaction
52	TM	45200	64600	18	0		WHT	0	25	25	75yr32						LMS	10	HR		N			-64.5875	-61.15	4	I	1*	4	Drought	
								25	55	30	75yr44						LMS	5	HR	G	N										
								55	120	65							IMP														Compaction
53	TM	45292	64640	15	2	S	PGR	0	20	20	75YR42						LMS	2	HR		N			11.35	-23.92	3a	I	1*	3a	Drought	Heavily poached, near gate
								20	50	30	75YR56						MSL	2	HR	M	N										
								50	120	70	75YR66						MCL	2	HR	M	N										IMP @ 70cm for stone
54	TM	45399	64600	16	0		CER	0	25	25	75YR32						LMS	2	HR		N			-5.2	-50.38	3b	I	1*	3b	Drought	
								25	65	40	75YR54						LMS	2	HR	M	N										
								65	100	35	75YR54						MSL	2	HR	M	N										
								100	120	20	75YR66						MSL	10	CH	M	N										
55	TM	45500	64600	15	0		CER	0	25	25	75YR32						LMS	2	HR		N			-34.45	-53.32	3b	I	1*	3b	Drought	
								25	70	45	75YR44						LMS	2	HR	M	N										
								70	100	30	75YR54						MS	2	HR	M	N										
								100	120	20	75YR54						LMS	2	HR	M	N										
56	TM	45600	64599	15	1	E	CER	0	25	25	75YR32						LMS	2	HR		N			-9.82	-39.6	3b	I	1*	3b	Drought	
								25	50	25	75YR44						LMS	2	HR	M	N										
								50	90	40	75YR56						HCL	2	HR	M	N	F									
								90	120	30	75YR56	F	75YR51	F	75YR58	Y	C	2	HR	M	N	F	Y								

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
57	TM	44816	64509	17	0		CER	0	25	25	75YR32						MSL	5	HR		N			12.97	-23.96	3a	III	2	3a	Drought	0>2
								25	50	25	75YR62	CF	75YR58			Y	SCL	2	HR	M	N		N							
								50	60	10	75YR53	CF	75YR61	CF	75YR56	Y	HCL	2	HR	P	N		Y							
								60	80	20	75YR54	CF	75YR61	CF	75YR56	Y	C	2	HR	P	N	C	Y							
								80	120	40	10YR56						MSL	5	HR	M	N									
58	TM	44898	64499	17	1	S	CER	0	25	25	75YR32						MSL	5	HR		N			-0.78	-24.14	3a	III	2	3a	Drought	1>2,0>6
								25	35	10	75YR56						HCL	2	HR	M	N										Very saturated from surface
								35	90	55	75YR56	FF	10YR52			Y	C	2	HR	P	N	C	Y							
								90	120	30	75YR56						C	20	CH	M	M									
59	TM	45008	64500	19	0		CER	0	25	25	75YR32						LMS	5	HR		N			-24.9225	-58.74	4	I	1*	4	Drought	
								25	55	30	75YR44						LMS	5	HR	M	N										
								55	80	25	75YR64						MS	2	HR	M	N										
								80	90	10	75YR66						MS	2	HR	M	N										
								90	120	30	75YR56						MCL	2	CH	M	N										
60	TM	45099	64499	19	0		CER	0	25	25	75YR32						LMS	8	HR		N			-74.8	-72.8	4	I	1*	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	50	5	75YR44						LMS	2	HR	P	N										
																	IMP													Compaction
61	TM	45200	64499	18	0		CER	0	25	25	75YR32						MSL	5	HR		N			-1.81	-26.9	3a	II	1	3a	Drought	
								25	45	20	75YR44						MSL	2	HR	M	N										
								45	60	15	75YR44						MSL	2	HR	P	N										
								60	120	60	10YR54	F	10YR62	F	10YR66	Y	HCL	2	HR	P	N		Y							
62	TM	45000	64400	19	0		CER	0	25	25	75YR32						LMS	8	HR		N			-79.7	-77.7	4	I	1*	4	Drought	
								25	45	20	75YR54						LMS	5	HR	M	N										
								45	50	5	75YR54						LMS	5	HR	P	N										
																	IMP													Compaction
63	TM	45100	64400	18	0		CER	0	25	25	75YR32						LMS	8	HR		N			-79.7	-77.7	4	I	1*	4	Drought	
								25	45	20	75YR54						LMS	5	HR	M	N										
																	IMP													Compaction
64	TM	45191	64399	17	0		CER	0	25	25	75YR32						MSL	2	HR		N			-63.2	-61.2	4	I	1	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
								45	50	5	75YR44						LMS	2	HR	P	N										
																	IMP													Compaction
65	TM	45000	64400	18	0		CER	0	25	25	75YR32						LMS	5	HR		N			-78.32	-76.32	4	I	1*	4	Drought	
								25	45	20	75YR44						LMS	2	HR	M	N										
																	IMP													Compaction
66	TM	45100	64299	17	1	S	CER	0	25	25	75YR32						LMS	8	HR		N			-79.7	-77.7	4	I	1*	4	Drought	
								25	45	20	75YR54						LMS	5	HR	M	N										

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour		IMP	%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	Compaction
67	TM	45511 63390	6			Meadow	0	45	45	10YR43						LS	2	HR		N			-31.425	-50.23	3b	I	1	3b	Drought	
						Habitat	45	75	30	10YR56						S	<1	HR	M	N										
						Creation	75	120	45	10YR68						S	<1	HR	M	N										
68	TM	45434 63499	1			Meadow	0	45	45	10YR22						SCL	<1	HR		N			-31.425	-50.23	3b	I	1	3b	Drought	Highly organic/wet material
						Habitat	45	120	75	10YR21						LS	<1	HR	G	N										
						Creation																								
69	TM	45322 63599	6			Meadow	0	50	50	10YR53						LS	2	HR		V			-28.2745	-47.32	3b	I	1	3b	Drought	
						Grazing	50	65	15	10YR43						S	<1	HR	M	N										
							65	83	18	10YR36						S	<1	HR	M	N										
							83	120	37	10YR58						S	<1	HR	M	N										
70	TM	45322 63599	6			Meadow	0	15	15	10YR46						LS	<1	HR		N			-23.735	-43.155	3b	I	1	3b	Drought	
						Grazing	15	55	40	10YR32						LS	2	HR	G	M										
							55	65	10	10YR34						LS	<1	HR	G	N										
							65	90	25	10YR66						S	<1	HR	M	N										
							90	100	10	10YR56	C	2.5Y63	M	10YR58	Y	C	<1	HR	P	N										
							100	120	20	10YR66						S	<1	HR	M	N										
71	TM	44512 63700	7			Meadow	0	20	20	10YR43						LS	2	HR		N			-39.2725	-65.08	4	I	1	4	Drought	Flint; >2cm 1%
						Habitat	20	75	55	10YR56						S	2	HR	M	N										Flint; >2cm 1%
						Creation	75	110	35	2.5Y53	F	10YR56			Y	C	<1	HR	P	N		Y							
							110	120	10	2.5Y66						S	<1	HR	M	N										
72	TM	45022 63699	10			Meadow	0	42	42	10YR53						LS	2	HR		V			-65.874	-63.08	4	I	1	4	Drought	
						Habitat	42	54	12	10YR43						S	<1	HR	M	M										
						Creation	IMP																							STOP @ GRAVEL
73	TM	45122 63699	9			Meadow	0	42	42	10YR33						SL	2	HR		V			3.093	-21.652	3a	I	1	3a	Drought	
						Habitat	42	90	48	10YR54						LS	<1	HR	G	M										
						Creation	90	120	30	10YR34						S	<1	HR	M	N										
74	TM	45222 63699	11			Meadow	0	30	30	2.5Y64						LS	<1	HR		N			-6.135	-38.8	3b	I	1	3b	Drought	
						Habitat	30	110	80	10YR31						LS	<1	HR	G	N										
						Creation	110	120	10	10YR56						S	<1	HR	M	N										
75	TM	45322 63699	12			Meadow	0	50	50	10YR32						LS	2	HR		S			-28.515	-47.32	3b	I	1	3b	Drought	
						Habitat	50	95	45	10YR44						S	<1	HR	M	N										
						Creation	95	120	25	10YR54						S	<1	HR	M	N										

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
76	TM	44522 63799	8			Meadow	0	35	35	10YR43						LS	5	HR		N			-54.568	-46.618	4	II	1	4	Drought	Flint; >2cm 2%
						Habitat	35	43	8	10YR56						S	<1	HR	M	N									
						Creation	43	70	27	10YR53	M	7.5YR58			Y	SL	<1	HR	P	N		Y								STOP @ Gravel
							IMP																						
77	TM	44622 63799	13			Potatoes	0	50	50	10YR44						LS	2	HR		N			33.855	-23.56	3a	I	1	3a	Drought	Large flint on surface
							50	78	28	10YR46						SCL	<1	HR	G	N									
							78	120	42	10YR66						SCL	<1	HR	G	N									
78	TM	44722 63799	14			Potatoes	0	40	40	10YR43						SL	2	HR		N			-0.835	-17.66	3a	I	1	3a	Drought	
							40	60	20	10YR46						SL	<1	HR	G	N									
							60	120	60	10YR66						S	<1	HR	G	N									
79	TM	44822 63799				Cereals	0	50	50	10YR44						LS	5	HR		N			-30.414	-49.24	3b	I	1	3b	Drought	Large flint on surface
							50	72	22	10YR56						S	2	HR	G	N									
							72	120	48	10YR58						S	<1	HR	G	N									
80	TM	44922 63799	14			Cereals	0	50	50	10YR44						LS	5	HR		N			-31.305	-49.6	3b	I	1	3b	Drought	
							50	105	55	10YR56						S	5	HR	M	N									Flint; >2cm 2%
							105	120	15	10YR58						S	<1	HR	G	N									
81	TM	45022 63799	14			Cereals	0	45	45	10YR44						LS	5	HR		N			-56.48	-51.53	4	I	1	4	Drought	
							45	60	15	10YR34						LS	2	HR	G	N									
							IMP																						STOP @ GRAVEL
82	TM	45104 63807				Cereals	0	48	48	10YR32						LS	<1	HR		N			-39.961	-48.436	3b	I	1	3b	Drought	Flints on surface
							48	100	52	10YR56						S	5	HR	M	N									
							IMP																						STOP @ GRAVEL
83	TM	45151 63842	13			Spring	0	50	50	10YR33						LS	2	HR		N			-28.515	-47.32	3b	I	1	3b	Drought	Large flint on surface
						Onions	50	110	60	10YR64						S	<1	HR	G	N									
							110	120	10	2.5Y64						S	<1	HR	G	N									
84	TM	45267 63851	16			Spring	0	50	50	10YR32						LS	2	HR		S			-18.6325	-37.64	3b	I	1	3b	Drought	Large flint on surface
						Onions	50	75	25	10YR43						LS	2	HR	G	N									
							75	90	15	10YR56						S	<1	HR	M	N									
							90	120	30	2.5Y64						S	<1	HR	M	N									

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
85	TM	44822	63899	16			Cereals	0	50	50	10YR34						LS	5	HR		N			-7.9925	-38.465	3b	I	1	3b	Drought	Flint; >2cm 2%
								50	65	15	10YR46						LS	5	HR	G	N										
								65	110	45	10YR56						SC	2	HR	M	N	Y									
								IMP																						STOP @ GRAVEL
86	TM	44922	63899	17			Cereals	0	40	40	10YR44						LS	5	HR		N			-67.9825	-64.99	4	I	1	4	Drought	Flint; >2cm 2%
								40	55	15	10YR46						S	1	HR/CH	G	S										Some chalk present
								IMP																						STOP @ GRAVEL
87	TM	45022	63899	17			Cereals	0	45	45	10YR33						LS	<1	HR		N			-55.78	-49.84	4	I	1	4	Drought	Large flint on surface
								45	70	25	10YR46						S	2	HR	M	N										
								IMP																						STOP @ GRAVEL
88	TM	45122	63899	15			Spring	0	40	40	10YR33						LS	2	HR		N			-27.3675	-52.685	3b	I	1	3b	Drought	
							Onions	40	55	15	10YR44						LS	<1	HR	G	N										
								55	90	35	10YR56	F	10YR43				S	2	HR	M	N										Flint; >2cm 2%
								90	120	30	10YR76	F	10YR58				S	<1	HR	G	N										
89	TM	45222	63899	14			Spring	0	45	45	10YR32						LS	2	HR		N			-31.425	-50.23	3b	I	1	3b	Drought	Flint; >2cm 1%
							Onions	45	85	40	10YR34						S	<1	HR	M	N										
								85	120	35	2.5Y66						S	<1	HR	G	N										
90	TM	45281	63911	14			Spring	0	45	45	10YR33						SL	<1	HR		N			-22.975	-31.87	3b	I	1	3b	Drought	Large flint on surface
							Onions	45	80	35	10YR44						S	<1	HR	M	N										
								80	100	20	7.5YR44	F	7.5YR56				S	<1	HR	M	N										
								IMP																						STOP @ GRAVEL
91	TM	45122	63999	17			Onions	0	40	40	10YR43						SL	2	HR		N			-16.395	-37.64	3b	I	1	3b	Drought	Flint; >2cm 1%
								40	70	30	10YR54						S	2	HR	M	N										Flint; >2cm 1%
								70	95	25	10YR58	F	10YR43				S	2	HR	M	N										
								95	110	15	10YR58						SCL	2	HR	M	N	Y									
								IMP																						STOP @ GRAVEL
92	TM	45230	63978	15			Onions	0	45	45	10YR43						SL	2	HR		N			-13.785	-32.59	3b	I	1	3b	Drought	Flint; >2cm 1%
								45	70	25	10YR56						S	<1	HR	M	N										
								70	120	50	10YR58						S	<1	HR	M	N										
93	TM	45122	64099	20			Grazing	0	45	45	10YR44						SL	<1	HR		N			-13.725	-32.47	3b	I	1	3b	Drought	
								45	80	35	7.5YR44						S	5	HR	M	N										Flint; >2cm 2%
								80	120	40	10YR56						S	<1	HR	M	N										
94	TM	45222	64099	16			Grazing	0	45	45	10YR43						SL	1	HR		N			-11.27	-32.47	3b	I	1	3b	Drought	
								45	80	35	7.5YR44						S	5	HR	M	N										Flint; >2cm 2%

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
							80	110	30	10YR66						S	5	HR	M	N									Flint; >2cm 2%
							110	120	10	10YR54						C	5	HR	M	N									
95	TM	45122 64199	16			Grazing	0	50	50	10YR43						SL	1	HR		N			14.5375	-7.12	2	I	1	2	Drought	Flint; >2cm 1%
							50	85	35	10YR44						SL	1	HR	G	N									
							85	110	25	10YR56						S	2	HR	M	N									Flint; >2cm 1%
							IMP																						STOP @ Gravel
96	TM	45222 64199	16			Grazing	0	40	40	10YR43						SL	2	HR		N			17.985	-12.76	2	I	1	2	Drought	Flint; >2cm 2%
							40	50	10	10YR44						SL	2	HR	M	N	Y								Flint; >2cm 2%
							50	75	25	10YR54						SL	10	CH/HI	G	V									Flint; >2cm 2%
							75	90	15	10YR56						SL	2	CH/HI	G	V									
							90	120	30	10YR66						S	<1	CH/HI	M	V									
97	TM	45322 64199	14			Grazing	0	45	45	10YR43						SL	2	HR		N			22.71	-7.84	2	I	1	2	Drought	
							45	90	45	10YR44						SL	<1	HR	G	N									
							90	120	30	10YR56						S	2	HR	M	N									
98	TM	45222 64299	17			Grazing	0	40	40	10YR43						SL	1	HR		N			-15.054	-22.852	3a	I	1	3a	Drought	
							40	58	18	10YR44						SL	<1	HR	M	N									
							58	102	44	10YR56						S	5	HR	M	N									Flint; >5cm 1%
							IMP																						STOP @ GRAVEL
99	TM	45322 64199	15			Grazing	0	40	40	10YR43						SL	1	HR		N			11.685	-7.12	2	I	1	2	Drought	Flint; >5cm 1%
							40	75	35	10YR44						SL	<1	HR	G	N									
							75	120	45	10YR56						S	<1	HR	M	N									
100	TM	45501 63100	16	0		WHT	0	25	25	7.5YR32						LMS	5	HR		N			-36.145	-54.19	3b	I	1	3b	Drought	
							25	35	10	75YR54						LMS	5	CH	M	M									
							35	55	20	7.5YR66						LMS	2	HR	M	M									
							55	80	25	10YR54						LMS	2	HR	M	N									
							80	120	40	7.5YR66						MS	0		M	N									
101	TM	45598 63100	14	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-38.96	-58.22	4	I	1	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	70	25	7.5YR44						MS	2	HR	M	N									Band of flint at 70 cm
							70	120	50	7.5YR66						MS	2	HR	M	N									
102	TM	45197 62989	15	2	W	WHT	0	25	25	7.5YR54						LMS	2	HR		N			-38.96	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR54						LMS	2	HR	M	N									
							45	70	25	7.5YR54						MS	2	HR	M	N									
							70	120	50	7.5YR66						MS	2	HR	M	N									
103	TM	45299 63000	17	0		WHT	0	25	25	7.5YR32						LMS	8	HR		N			-29.76	-48.48	3b	I	1*	3b	Drought	
							25	50	25	7.5YR54						LMS	8	HR	M	N									
							50	70	20	7.5YR53	CF	7.5YR68	CF	7.5YR62	Y	C	2	HR	P	N		Y							

Point	Grid ref.		Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
							70	95	25	7.5YR53	CF	7.5YR68	CM	7.5YR52		C	12	CH	M	M	F								
							95	115	20							C	20	CH	M										
							115	120								IMP			P										
104	TM	45398 63002	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-36.235	-55.46	4	I	1*	4	Drought	
							25	60	35	7.5YR54						LMS	2	HR	M	N									
							60	110	50	7.5YR56						MS	5	HR	M	N									
							110	120	10	10YR61	FC	10YR56			Y	C			P	N	F	Y							
105	TM	45488 62999	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-39.61	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	60	15	5YR44						MS	2	HR	M	N									
							60	120	60	7.5YR54						MS	2	HR	M	N									
106	TM	45596 63002	14	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-41.43	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	70	25	7.5YR44						MS	2	HR	M	N									
							70	100	30	7.5YR66						MS	2	HR	M	N									
							100	120	20							MS	20	HR	M										Flints
107	TM	44997 62877	11	4	NNW	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-54.35	-60.18	4	I	1*	4	Drought	
							25	35	10	7.5YR43						LMS	2	HR	M	N									
							35	70	35	7.5YR56						MS	2	HR	M	N									
							70	80	10	10YR62	CM	10YR56			Y	C	2	HR	P	N		N							
							80	90	10	7.5YR66						MS	2	HR	M	N									
							90	120								IMP			P										Sandstone
108	TM	45103 62901	11	3	NE	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-49.43	-58.22	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	60	15	7.5YR44						MS	2	HR	M	N									
							60	100	40	7.5YR66						MS	2	HR	M	N									
							100	120								IMP			P										Sandstone
109	TM	45199 62900	13	2	WSW	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-51.885	-58.22	4	I	1*	4	Drought	
							25	40	20	7.5YR43						LMS	2	HR	M	N									
							40	90	50	7.5YR66						MS	2	HR	M	N									
							90	120								IMP			P										Sandstone
110	TM	45318 62898	15	2	SSE	WHT	0	25	25	7.5YR32						MSL	8	HR		N			-7.815	-29.89	3a	II	1	3a	Drought	
							25	50	25	7.5YR44						MSL	8	HR	M	N									
							50	65	15	7.5YR54						LMS	2	HR	M	N									
							65	95	30	10YR64		10YR62				C	2	HR	M	N	C	Y?							
							95	115	20							C	20	HR	M										Flints
							115	120								IMP			P										
111	TM	45399 62901	17	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-37.65	-55.28	4	I	1*	4	Drought	
							25	60	35	7.5YR43						LMS	2	HR	M	N									
							60	120	60	7.5YR66						MS	2	HR	M	N									
112	TM	45502 62897	17	0		WHT	0	25	25	7.5YR32						LMS	8	HR		N			-67.2	-61.8	4	I	1*	4	Drought	
							25	50	25	7.5YR43						LMS	5	HR	M	N									
							50	70	20							MS	20	HR	M										Flints
							70	120								IMP			P										
113	TM	45601 62900	17	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-64.8	-59.4	4	I	1*	4	Drought	Close to depression
							25	50	25	7.5YR43						LMS	2	HR	M	N									
							50	70	20							MS	20	HR	M										Flints
							70	120								IMP			P										
114	TM	45698 62897	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-40.025	-58.7	4	I	1*	4	Drought	
							25	45	20	7.5YR43						LMS	2	HR	M	N									
							45	55	10	7.5YR44						MS	2	HR	M	N									
							55	65	10	7.5YR44						MS	10	HR	M	N									
							65	120	55	7.5YR66						MS	2	HR	M	N									
115	TM	45211 62813	14	2	W	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-37.65	-55.28	4	I	1*	4	Drought	
							25	60	35	7.5YR44						LMS	2	HR	M	N									
							60	100	40	5YR54						MS	2	HR	M	N									

Point	Grid ref.			Alt	Grad	Aspect	Land use	Depth (cm)			Soil matrix	Mottle 1		Mottle 2		Gley	Texture	Stones		SUBS STR	Calc.	Mn C	SPL	Drought			Wet		Classification		Point notes
	Sqr.	E	N					Top	Bttm	Thick	Munsell colour	Form	Munsell colour	Form	Munsell colour			%	Type					MBw	MBp	Gd	WC	Gw	Grade	Limitation	
								100	120	20	7.5YR66						MS	2	HR	M	N										
116	TM	45300	02800	17	1	W	WHT	0	25	25	7.5YR43						LMS	2	HR		N			-17.07	-59.2	4	I	1*	4	Drought	
								25	40	15	7.5YR44						LMS	2	HR	M	N										
								40	80	40	7.5YR64						MS	2	HR	M	N										
								80	120	40	7.5YR64						MSL	2	HR	M	N										
117	TM	45400	62800	17	0		WHT	0	25	25	7.5YR32						LMS	5	HR		N			-36.375	-57.02	4	I	1*	4	Drought	
								25	60	35	7.5YR44						LMS	5	HR	M	N										
								60	110	50	7.5YR66						MS	2	HR	M	N										
								110	120	10	7.5YR54						C	2	HR	M	N										
118	TM	45499	62797	17	0		WHT	0	25	25	7.5YR32						MSL	8	HR		N			-18.6825	-40.76	3b	III	2	3b	Drought	
								25	55	30	7.5YR44						LMS	5	HR	M	N										
								55	120	65	7.5YR54	FF	7.5YR62	FF	7.5YR56	Y	C	2	HR	P	N	F	Y								
119	TM	45599	62799	17	0		WHT	0	25	25	7.5YR32						MSL	2	HR		N			-28.84	-33.23	3b	I	1	3b	Drought	
								25	55	30	7.5YR44						LMS	2	HR	M	N										
								55	70	15	7.5YR66						C	2	HR	M	N										
								70	110	40	7.5YR66						MS	2	HR	M	N										
								110	120								IMP			P											
120	TM	45699	62799	17	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-41.52	-59.2	4	I	1*	4	Drought	
								25	40	15	7.5YR43						LMS	2	HR	M	N										
								40	80	40	7.5YR54						MS	2	HR	M	N										
								80	90	10	10YR64	FF	10YR62	FF	10YR66		MS	2	HR	M	N	F										
								90	120	30	7.5YR54						MS	8	HR	M	N										
121	TM	45400	62699	17	0		WHT	0	25	25	7.5YR32						LMS	5	HR		N			-13.835	-55.06	4	I	1*	4	Drought	
								25	60	35	7.5YR44						LMS	5	HR	M	N										
								60	80	20	7.5YR64						LMS	2	HR	M	N										
								80	120	40	7.5YR54	C	10YR56			Y	MSL	2	HR	M	N										
122	TM	45504	62698	16	0		WHT	0	25	25	7.5YR32						MSL	5	HR		N			-45.765	-45.44	3b	I	1	3b	Drought	
								25	65	40	7.5YR44						LMS	2	HR	M	N										
								65	85	20							LMS	20	HR	M											Flints (3 attempts)
								85	120								IMP			P											
123	TM	45504	62698	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-6.645	-41.56	3b	I	1*	3b	Drought	
								25	50	25	7.5YR44						LMS	2	HR	M	N										
								50	95	45	7.5YR66						MSL	2	HR	M	N										
								95	115	20							MSL	20	HR	M											
								115	120								IMP			P											
124	TM	45699	62699	17	0		WHT	0	25	25	7.5YR32						MSL	10	HR					2.125	-20.75	3a	II	1	3a	Drought	
								25	60	35	7.5YR43						MSL	5	HR	M											
								60	100	40	10YR64	FF	10YR62	FF	10YR66		C	2	HR	M		F	Y?								
								100	120	20							C	20	HR	M											
125	TM	45499	62599	16	0		WHT	0	25	25	7.5YR32						LMS	2	HR		N			-39.61	-58.22	4	I	1*	4	Drought	
								25	45	20	7.5YR43						LMS	2	HR	M	N										
								45	120	75	7.5YR66						MS	2	HR	M	N										
126	TM	45599	62599	15	1	S	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-39.61	-58.22	4	I	1*	4	Drought	
								25	45	20	7.5YR43						LMS	2	HR	M	N										
								45	120	75	7.5YR66						MS	2	HR	M	N										
127	TM	45684	62602	16	1	S	WHT	0	25	25	7.5YR32						LMS	2	HR		N			-37.65	-55.28	4	I	1*	4	Drought	
								25	60	35	7.5YR43						LMS	2	HR	M	N										
								60	120	60	7.5YR66						MS	2	HR	M	N										

Auger Log key

Depth - Top

xx	Underlining denotes depth to the top of a slowly permeable layer

Land use

ARA	Arable
CER	Cereal
WHT	Wheat
BAR	Barley
MZE	Maize
OAT	Oats
OSR	Oilseed rape
LIN	Linseed
FBE	Field beans
POT	Potatoes
SBT	Sugar beet
BRA	Brassicas
FOD	Fodder crops
FRT	Soft and top fruit
HRT	Horticultural crops
PAS	Pasture
LEY	Ley grass
PGR	Permanent pasture
RGR	Rough grazing
SCR	Scrub
HTH	Heathland
BOG	Bog or marsh
DCW	Deciduous Woodland
CFW	Coniferous woodland
PLO	Ploughed
STB	Crop stubble
FLW	Fallow (inc. set aside)
SAS	Set aside (where known)
OTH	Other

Mottle 1,2 - Form

FF	Few Feint
FD	Few Distinct
FP	Few Prominent
CF	Common Feint
CD	Common Distinct
CP	Common Prominent
MF	Many Feint
MD	Many Distinct
MP	Many Prominent
VF	Very many Feint
VD	Very many Distinct
VP	Very many Prominent

Texture

CS	Coarse Sand
MS	Medium sand
FS	Fine Sand
LCS	Loamy Coarse Sand
LMS	Loamy Medium Sand
LFS	Loamy Fine Sand
CSL	Coarse Sandy Loam
MSL	Medium sandy loam
FSL	Fine Sandy Loam
CSZL	Coarse Sandy Silt Loam
MSZL	Medium Sandy Silt Loam
FSZL	Fine Sandy Silt Loam
ZL	Silt Loam
SCL	Sandy Clay Loam
MCL	Medium Clay Loam
HCL	Heavy Clay Loam
MZCL	Medium Silty Clay loam
HZCL	Heavy Silty Clay Loam
SC	Sandy Clay
ZL	Silty Clay
C	Clay
P	Peat
SP	Sandy Peat
LP	Loamy Peat
PL	Peaty Loam
PS	Peaty Sand
MZ	Marine Light Silts
IMP	Impenetrable to roots

Limitations

NN	None
OC	Overall climate
AE	Aspect
EX	Exposure
FR	Frost risk
GR	Gradient
MR	Microrelief
FL	Flood risk
TX	Texture
DP	Soil depth
CH	Chemical
WE	Wetness
WK	Workability
DR	Droughtiness
ER	Erosion risk
WD	Wetness/Droughtiness
ST	Topsoil stoniness

Stones - Type

HR	All hard rocks and stones
MSST	Soft, medium or coarse grained sandstone
SI	Soft weathered igneous or metamorphic rock
SLST	Soft oolitic or dolomitic limestone
FSST	Soft, fine grained sandstone
ZR	Soft, argillaceous or silty rocks
CH	Chalk or chalk stones
GH	Gravel composed of non-porous (hard) stones
GS	Gravel composed of porous (soft) stones

Subs Str (subsoil structural condition)

G	Good
M	Moderate
P	Poor

Calcareousness

N	Non-calcareous (<0.5% CaCO3)
VS	Very slightly calcareous (0.5 - 1% CaCO3)
S	Slightly calcareous (1 - 5% CaCO3)
M	Moderately calcareous (5 - 10% CaCO3)
V	Very calcareous (>10% CaCO3)
Y	Calcareous (>1% CaCO3)

Mn C (ferrimanganous concretions)

F	Few
C	Common
M	Many
V	Very many
Y	Common or greater

APPENDIX B

Soil Stripping Method

This annex presents the methods for the following:

1. Treatment of existing vegetation
2. Access routes
3. Topsoil stripping
4. Subsoil stripping

Existing Vegetation

Woodlands/hedges shall be pre-treated before soil stripping, in two stages:

- Each tree shall be felled and removed from site, including all branches/brash;
- Tree stumps and associated large roots (>20mm diameter) shall be lifted using a suitable excavator.

All woody materials (tree trunks, stumps, branches and brash, etc), including wood chippings, shall be removed from the area being stripped and will be managed in accordance with the Site Waste Management Plan.

Woody materials shall not be incorporated with the soils during stripping. This includes any chippings left on the surface after recent woodland/hedges clearance works.

Any temporary stockpiles of woody materials shall be constructed with a small ‘core’ to minimise the risk of spontaneous combustion and monitored as appropriate.

Other vegetation will be cleared using an appropriate method. All arisings will be removed prior to soil stripping commencing.

Access routes

Access to each area/compartment to be stripped shall be created by stripping the topsoil, followed by subsoil, to expose the ‘basal layer’. The intention is that the receiving dump truck for the rest of the area/compartment shall run on the basal layer to prevent damage to the topsoil or subsoil.

Access shall be created wide enough to permit access for the dump trucks which shall transport the stripped soils to the storage area.

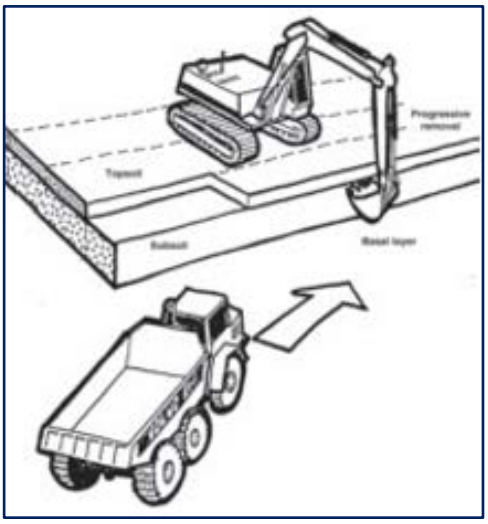
Topsoil and Subsoil Stripping

In advance of stripping the topsoil it shall be cleared of all foreign matter or waste materials e.g. building rubble and fill materials.

Topsoil and subsoil shall be stripped using a hydraulic excavator or tracked dozer and transported using dump trucks (unless being stockpiled to one side of the construction area) in accordance with the guidance set out in MAFF (2000), as summarised below.

Where a hydraulic excavator is used (fitted with a flat-edged grading bucket), it shall stand on the surface of the topsoil or subsoil, digging into the layer to its maximum depth before loading it into a dump truck. See Figure B1 below (showing topsoil stripping).

Figure B1 – Topsoil Stripping using hydraulic excavator and dump truck



Where a tracked dozer is used it shall run on the surface of the subsoil and push up the topsoil / run on the basal layer and push up the subsoil in a single pass into a temporary row at the end of its run. Using a hydraulic exactor, the stripped material shall be loaded onto a dump truck for transportation to the designated stockpile location (see figures B2 and B3 below).

Figure B2 – Soil stripping with bulldozers and dump trucks: the bed and segment system

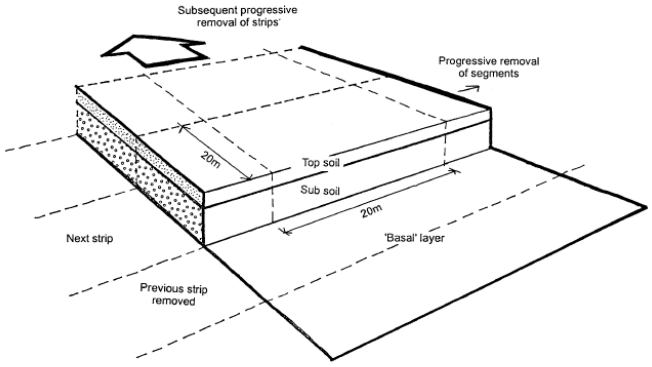
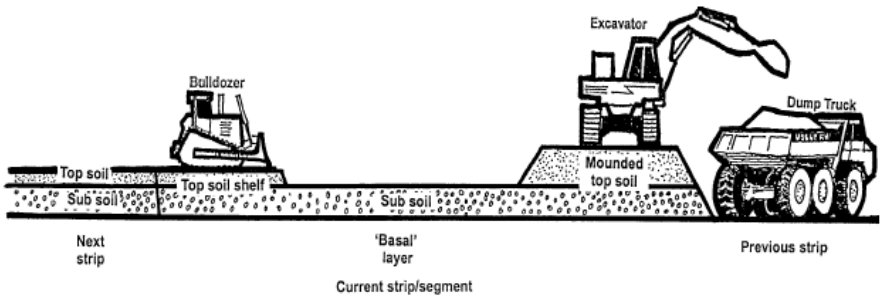


Figure B3 – Soil stripping with bulldozers and dump trucks: Topsoil



The depth of strip shall be as set out in the SRP. The aim of the topsoil strip is to enable the majority of the topsoil to be recovered without the inclusion of significant quantities of underlying subsoil. Some variation in topsoil depths is expected and therefore some discretion shall be made by the machine operator (based on soil colour and/or firmness) during the topsoil strip to maximise topsoil recovery without compromising the quality of the soil resource.

Once loaded, the dump truck shall transport the topsoil along the pre-designated access route to the desired stockpile location.

These operations shall be closely monitored to ensure that the correct soil type is recovered without the inclusion of other soils or wastes.

APPENDIX C

Field Assessment of Soil Plasticity

This annex presents the method for assessing the plasticity (consistency) of soils in the field. This method is to be used to assess soil plasticity at all pertinent stages of the earthworks programme including:

- In-situ before/during soil stripping
- Storage stockpiles (non-plastic soils only)
- Reconditioning windrows
- During soil re-spreading and decompaction/cultivation operations.

The procedure is outlined as:

- Walkover/visual examination
- Soil sampling
- Sample assessment

Walkover/visual examination

The assessor shall first walk over or along the area/field or stockpile/windrow to be assessed in order to identify any apparent significant variability (e.g. evidence of poaching incidents of surface water ponding saturated soils, or distribution of moisture loving plant species such as *Juncus*) and to identify suitable locations for sampling.

In addition to any areas identified from the walkover any locations likely to display varying plasticity to the majority (low lying spots, the base of stockpiles/windrows etc) shall be accounted for when sampling.

Site observations relating soil moisture content and soil plasticity and the distribution of any significant variability shall be recorded.

Soil Sampling

For undisturbed areas, the topsoil and upper subsoil shall be sampled at representative locations using an Edelman soil auger. Separate samples from each soil layer shall be taken from their full depth.

For stockpiles and windrows, the soil shall be sampled at representative locations using an Edelman soil auger from 0.0m to 0.5m and 0.5m top 1.0m. Where deemed necessary by the Site Soil Scientist, samples from greater depths shall obtained using a suitable sized mechanical excavator.

For each layer approximately, a double handful of soil shall be collected and mixed up in a suitable container.

A minimum of 5 No. locations shall be sampled and assessed per field or stockpile/windrow.

Sample Assessment

The test sample (small handful) shall be taken from the collected sample and prepared for assessment by removing stones and vegetation including all roots greater than 1mm. Any significant quantity of very fine roots (<1mm) shall be removed.

The test sample shall be kneaded to break down any structure and ensure the mass is all at the same moisture content and assessed in accordance with the table below.

Table 1

If the soil sample is wet, films of water are visible on the surfaces of grains and aggregates and/or when a soil sample is squeezed in the hand and it readily deforms into a cohesive "ball".	HANDLING NOT RECOMMENDED – IF HANDLED STOCKPILED MATERIAL TO BE RECORDED AS PLASTIC
Peds (structures) break up/crumble readily when squeezed in the hand rather than forming into a ball.	HANDLING OK

If the sample is moist, there is a slight dampness when squeezed between the fingers, but it does not significantly change colour (darken) on further wetting	NO HANDLING BY DOZERS BUT MAY BE HANDLED BY TRACKED EXCAVATORS IF CONSISTENCY TEST IS PASSED
If the sample is dry and brittle it will look dry and change colour (darken) if water is added	HANDLING OK IF CONSISTENCY TEST IS PASSED

Consistency Test

Attempt to mould a soil sample into a ball by hand:

Table 2

Impossible because the soil is too hard (dry)	HANDLING OK
Impossible because the soil is too loose (dry)	HANDLING OK
Impossible because the soil is too loose (wet)	HANDLING NOT RECOMMENDED – IF HANDLED STOCKPILED MATERIAL TO BE RECORDED AS PLASTIC
Possible	GO TO TABLE BELOW

Attempt to roll the ball into a thread of 3mm diameter on a flat non-adhesive surface using light pressure from the flat of the hand:

Table 3

Impossible; the soil crumbles or disintegrates	HANDLING OK
Possible	HANDLING NOT RECOMMENDED – IF HANDLED STOCKPILED MATERIAL TO BE RECORDED AS PLASTIC

APPENDIX D

Soil Stockpiling Method

Introduction

This annex presents the methods for the storage (stockpiling) of soils. All topsoil and subsoil shall be stored in stockpiles following the method presented here.

Soils shall be stored in area(s) of the site where they will not interfere with other site operations so that they can be left undisturbed during other construction activities.

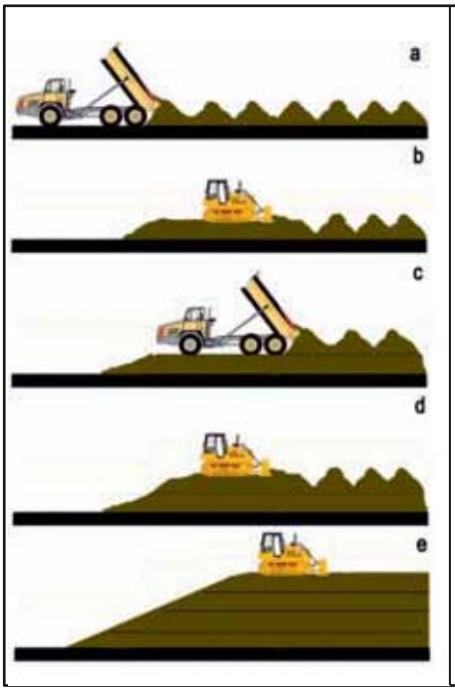
The area(s) designated for soil storage shall be cleared of vegetation and stripped, where required, ahead of stockpile construction. For the topsoil stockpile, which will be created on top of in situ topsoil, a marker layer of straw will first be placed to ensure, at the time of soil recovery, it is clear where the base of the stockpiled material lies.

Prior to storage, the consistency of each soil shall be assessed in-situ to determine soil consistency using the method provided in Annex C. All soils shall be stored using the following method, but soils found to be non-plastic shall be handled and stored separately to plastic soils.

Stockpiling Method

The *Stockpiling Method* illustrated in Figure D1 below shall be used to store non-plastic soils, or plastic soils.

Figure D1 – Stockpiling Method



The process requires the soil to be transported to the storage area in a dump truck, and 'loose tipped' in a line of heaps to form a windrow (a).
Once the heaps cover the storage area, a tracked dozer (e.g. D6 Caterpillar) shall level the heaps to form a level, stable platform for dump trucks to travel across to tip a second layer of topsoil. (b and c) This sequence shall be repeated until the maximum stockpile height is achieved (d).
Assuming that the topsoil is reasonably dry and friable during the stripping and storage operation, it shall be heaped to its maximum permitted height for this site.
To protect from wet weather once the final height is achieved, the excavator or blade shall regrade the sides and top of the stockpile to firm the surface by tracking across it to form a smooth gradient. The aim is to seal in the dry topsoil and reduce rainfall/infiltration and stabilise the surface (e).
Once the stockpile has been completed, the area shall be cordoned off to prevent any disturbance or contamination by other construction activities.
Emergent vegetation resulting from seeding/hydroseeding shall be managed to a maximum height of 300mm and not allowed to 'set seed'.

This method enables soil to be stored with a minimum footprint with a maximum stockpile core volume. This reduces the soils exposure to precipitation and ensures that non-plastic soils are kept dry and their quality is maintained during the storage period.

Plastic soils stored using this method will remain in a plastic state until they have been reconditioned successfully by using the *Soil Reconditioning Method* (Annex E).

APPENDIX E

Soil Reconditioning Method

Introduction

This annex presents the methods for reconditioning plastic soils. All topsoil and subsoil which are plastic in consistency shall be reconditioned using the method presented here.

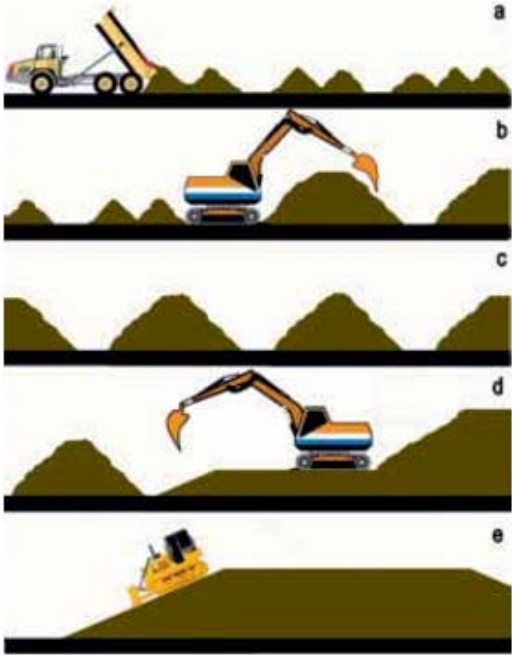
Soils shall be reconditioned in area(s) of the site where they will not interfere with other site operations so that they can be left undisturbed by other construction activities.

The area(s) designated for soil reconditioning shall be cleared of its' vegetation and stripped of topsoil and subsoil (see Annex B) ahead of soil reconditioning activities.

Soil Reconditioning Method

The Soil Reconditioning Method illustrated in Figure E1 below shall be applied to recondition plastic soils in windrows. The method below shows re-stockpiling of soils; once reconditioned soils can also be used in restoration immediately.

Figure E1 – Stockpiling Method 2



Excavate soil from existing stockpile using a hydraulic excavator fitted with a toothed bucket. Load into dump truck and move to reconditioning area.

The soil is tipped in a line of heaps to form a 'windrow', starting at the furthest point in the storage area and working back toward the access point (a).

Any additional windrows are spaced sufficiently apart to allow tracked plant to gain access between them so that the soil can be heaped up to a maximum height of approximately 2m (b). To avoid compaction no machinery, even tracked plant, traverses the windrow.

Once the soil has dried out and is non-plastic in consistency (this usually requires several weeks of dry and windy or warm weather and for the windrows to be turned at least once), (c) the windrows are combined to form large stockpiles to the maximum height for this site using a tracked excavator (d).

The surface of the stockpile is then regarded and compacted (e) by a tracked machine (dozer or excavator) to reduce rainwater infiltration.

This method enables soil to be stored with a minimum footprint with a maximum stockpile core volume. This reduces the soils exposure to precipitation and ensures that non-plastic soils are kept dry and their quality is maintained during the storage period.

APPENDIX F

Soil Placement

This annex presents the methods for the placement of the soils for site restoration/reinstatement (overburden, topsoil and subsoil). It comprises the following:

1. Soil handling considerations;
2. Placement and treatment of overburden;
3. Subsoil and topsoil placement and spreading;
4. Cultivations and monitoring.

Soil Handling Considerations

For the duration of the soil works, the following soil handling recommendations shall be followed. It is important to avoid further physical degradation during all phases of soil placement and handling (e.g. re-spreading/placement, overburden ripping/subsoiling and topsoil cultivation). As a consequence, soil handling operations shall be carried out when soil is non-plastic in consistency.

In particular, it is important to ensure that the soils (topsoil and subsoil) are not unnecessarily compacted by trampling or trafficking by site machinery. In addition, soil handling shall be stopped during and after heavy rainfall, and not continue until the soil is again non-plastic in consistency.

If, during the course of the earthworks, the soil is structurally damaged, it will be important to ensure that it is suitably cultivated to relieve the compaction and restore the structure.

To maximise the effectiveness of the cultivation, all tillage operations (overburden ripping, subsoiling and topsoil cultivations) should be carried out when the soils being worked are non-plastic in consistency.

Placement and Treatment of Overburden

To achieve appropriate loosening of the overburden material over large accessible areas, a heavy duty subsoiler/ripper fixed to a tracked dozer will be used (D8 or equivalent). Where access is limited, a single rigid tine fitted to a hydraulic excavator is appropriate.

Plate 1 – Tracked dozer fitted with subsoiler/ripper

Plate 2 – Subsoiler/ripper close view

Plate 3 – Single rigid tine on a mechanical excavator

Plate 4 – Single rigid tine working

Overburden ripping depth shall be to 0.4m, with tine spacing at a maximum of 1m centres. Any oversized rocks (greater than 0.2m diameter) that are uplifted to the soil surface during ripping will be picked and removed for use as infill elsewhere.

To maximise drainage potential, ripping shall include a straight run across the width of the field/compartment at an angle of approximately 45° to any slope followed by a subsequent oblique pass. If assessed as necessary by the Site Soil Scientist, a third pass shall be run at an angle of 90° to the first pass to ensure that there are no remaining blocks of unbroken compacted soil. Once ripping is complete, the placement of subsoil, followed by topsoil can take place.

Subsoil and Topsoil Placement

An indicative sequential approach for replacement of topsoil and subsoil in each field/compartment (agricultural and non-agricultural areas) is outlined below:

Subsoil Placement

Remove subsoil from stockpiles using hydraulic excavator fitted with toothed bucket to avoid excessive smearing. Transport with dump truck to the appropriate reinstatement/restoration compartment.

The dump truck shall transport the subsoil to the desired location and tip it in a line of heaps. It shall then be spread by either a tracked dozer or second tracked excavator.

Subsoil depths to be checked by Site Soil Scientist to ensure correct subsoil depth is achieved across the entire field/compartment.

Topsoil Spreading

Once satisfactory subsoil placement has been achieved, topsoil shall be removed from stockpiles and spread in the field/compartment, following the same procedures for subsoil above.

Topsoil depths to be checked by Site Soil Scientist to ensure correct topsoil depth is achieved across the entire field/compartment.

Cultivations and Monitoring

Once the soil profile has been formed, an appropriate tracked machine or tractor fitted with a wing-tine subsoiler shall be used for loosening the subsoil (subsoiling). For inaccessible areas, a suitable tracked excavator, fitted with a single rigid tine (ripper tooth) shall be used.

The soil profile should be loosened by subsoiling to a minimum depth of 0.6m below surface level at maximum 0.6m centres.

Plate 5 – Wing-tine subsoiler

Plate 6 – Tractor drawn subsoiler

To maximise drainage potential, subsoiling shall include a straight run across the width of the field/compartment at an angle of approximately 45° to any slope followed by a subsequent oblique pass. If assessed as necessary by the Site Soil Scientist, a third pass shall be run at an angle of 90° to the first pass to ensure that there are no remaining blocks of unbroken compacted soil.

To be fully effective, this shall be carried out when soils are dry and friable to the full depth of working. Otherwise the tine merely cuts and smears the soil rather than lifting, fracturing and loosening it.

After subsoiling the Site Soil Scientist shall assess the subsoil layer to check the effectiveness of the operation.

If the subsoil is found to be compacted, it shall be re-ripped to loosen any residual panning.

Provided the physical condition of the subsoil is acceptable, the topsoil is to be cultivated to its full depth using appropriate tillage equipment (e.g. chisel plough, power harrow or set of discs) to break down any large, compacted lumps to produce a suitable tilth. This operation will also help to re-aerate the topsoil after storage. Repeat cultivation may be required to break down larger clods and achieve a suitable tilth.

Where access is limited, the topsoil may be cultivated using a landscape rake attachment fitted to a suitable hydraulic excavator.

Plate 8 – Example of landscape rake (2)

Plate 7 – Example of landscape rake (1)

Only when the soil has lost any sour odour and grey coloration will it be satisfactory.

Any undesirable material brought to the surface during this exercise shall be removed by picking or raking. For example, stones, fill materials and coarse vegetation larger than 50mm in any dimension.

After topsoil cultivation, the Site Soil Scientist shall assess the topsoil horizon to check the effectiveness of the operation.

If the topsoil is found to compacted or shows signs of anaerobism, it shall be re-cultivated to a suitable depth to eliminate any remaining compaction and assist the re-aeration process.

APPENDIX G

Soil Stockpile/Windrow Inspection Checklist

This annex presents the considerations for assessing the soil storage stockpiles.
All soil stockpiles shall be inspected during their construction and once completed. Afterwards each stockpile shall be inspected monthly.

Inspection checklist – during stockpile and window construction

The inspection checklist during stockpile and window construction shall include but may not be limited to the following:

Inspection Detail – During Stockpile / Window Construction	
1	Stockpile/window construction operations to ensure that a single soil type is stores per stockpile / windrow.
2	Soil plasticity to ensure non-plastic and plastic and plastic soils are properly segregated.
3	Non-compliant stockpile/windrow construction methods or machinery which cause additional or avoidable compaction or loss of soil structure.
4	Any signs of inappropriate vehicle tracking, indicating inappropriate access and trafficking, causing additional unnecessary compaction.
5	Stockpile surface following temporary or final sealing to ensure successful restriction of water infiltration.
5a	Windrow surface left rough/uneven to encourage drying.
6	Any locations where boundaries between segregated soil stockpiles/windrows have become amalgamated, causing contamination of one soil type with another.

Inspection checklist – after stockpile or windrow completion

The inspection checklist after stockpile/windrow construction will include but may not be limited to the following:

Inspection Detail – During Stockpile / Window Construction	
1	Any locations where boundaries between segregated soil stockpiles/windrows have become amalgamates, causing contamination of one soil type with another.

2	Vegetation – any plants over 300mmm height or beginning to develop seeds.
3	Identification of any unacceptable weed colonisation.
4	Any signs of surface soil erosion – caused by surface water runoff or wind, or any locations of surface water pending indicating that stockpile is not shedding water correctly.
5	Any signs of water surface water run-off or soil wash out from the stockpiles.
6	Any signs of inappropriate vehicle tracking, indicating inappropriate access and trafficking, causing additional unnecessary compaction.
7	Monitor plasticity of reconditioning soil within windows to depth of 1m.

APPENDIX H

List of Data to be included in Soil Stripping/Stockpiling Documentation and Database

No	Information to be Recorded	Cross Reference
	All In-situ Soils	
1	Field or compartment identification code (refer to Soil Stripping Plan)	Soil Stripping Plan showing coded fields/compartment locations
2	Field/compartment vegetation type	Existing Landscape Features Plan
3	Successful treatment of vegetation?	SMP methods of vegetation treatment
4	Identification of soil ownership	SRP
5	Confirmation of soil type	SRP
6	Soil depth stripped	SRP
7	Soil plasticity (determined as 'plastic' or 'non-plastic')	SMP Field assessment of soil plasticity
8	Date (s) stripped, weather conditions during stripping, equipment/plant used for stripping.	
9	Date and location code when soil moved to stockpile (refer to Stockpile Plan). Designate each stockpile or stockpile portion as 'plastic' or 'non-plastic'	Soil Stockpiling Plan showing coded locations
	All Stockpiles	
10	Record any stockpile non-compliance from stockpile inspections. Detail, date and stockpile location code (refer to Stockpile Inspection Checklist and Stockpile Plan)	Stockpile Inspection Checklist Soil Stockpiling Plan showing coded locations
	Soil Reconditioning Windrows	
11	Date and location code of plastic soil stockpile	Soil Stockpiling Plan

	when soil is removed from stockpile to reconditioning area. Record the location of code of soil within reconditioning area.	showing coded locations. Soil Reconditioning Plan showing coded locations.
12	Plasticity status of each soil windrow within reconditioning area	SMP Field assessment of soil plasticity Soil Reconditioning Plan showing coded locations.
13	Record the location code of soil which meets the acceptability criteria and is moved to the storage area. Designate soil as ‘non-plastic’. (If acceptability criteria are not achieved, schedule further soil reconditioning).	Soil Stockpiling Plan showing coded locations.
	Re-use	
14	Date and stockpile location code when non-plastic soil is removed from stockpile to reinstatement or restoration field/compartment. Record the location code of reinstatement or restoration field/compartment (refer to Landscape Reinstatement of restoration Plan)	Relevant Restoration Plan showing coded field/compartment locations.
15	Date and location code of reinstatement or restoration field/compartment for all soil sampling and analysis (*in situ* assessment and laboratory analysis). If acceptability criteria are achieved, sign off on reinstatement/restoration. If acceptability criteria are not achieved, schedule further soil management operations and further assessment suite of in situ testing.	Relevant Reinstatement Plan showing coded field/compartment locations.
	Sign-off	
17	Sign off final completion of soil reinstatement/restoration work.	

APPENDIX I

Soil Audit Checklist

Ref	Audit Item / Activity Checks	Frequency	Date Due	Responsible Person*	Sign-off and Date
A	**Training and Communication (See also Section E below)**				
1	Present key issues of Soil Management Plan to the Site Environmental Lead, the Earthworks Lead and his workforce	Once, at start of site prep works		Soil Scientist	
2	Train key staff in identification of topsoil and subsoil resources to ensure accurate soil stripping and prevention of contamination	Once, at start of site prep works		Soil Scientist	
3	Train Earthwork Lead or appointed delegate to assess soil plasticity using the prescribed Field Technique	Once, at start of site prep works		Soil Scientist	
B	**Inspections**				
1	Check adherence to access/haul route + compliance with no off-route access (to prevent trafficking and compaction of off-route soil)	Continuous through site prep works		Site Environmental Lead	
2	Inspection of site vegetation and foreign matter in compartment ahead of sol stripping	Ahead of soil stripping		Site Environmental Lead	

Ref	Audit Item / Activity Checks	Frequency	Date Due	Responsible Person*	Sign-off and Date
3	Check that all soils designated as plastic and non-plastic are segregated and are accurately documented and annotated on soil stripping and stockpiling phasing plan.	Ahead of soil stripping		Soil Scientist	
4	Inspection of soil storage stockpiles, using checklist	Monthly		Soil Scientist	
5	Inspection of soil reconditioning windrows	Weekly or as frequently as required		Soil Scientist	
C	**Monitoring Schedules**				
1	Acceptability Criteria – Site Vegetation and Foreign Matter	Prior to stripping – as required by the stripping programme		Soil Scientist	
2	Determination of soil plasticity status + compartment/field location code	Prior to stripping – as required by stripping programme		Soil Scientist	
3	Acceptability Criteria – Soil storage stockpiles	During construction, once completed. Monthly thereafter		Soil Scientist	
4	Acceptability Criteria – Soil reconditioning windrows	During construction, once		Soil Scientist	

Ref	Audit Item / Activity Checks	Frequency	Date Due	Responsible Person*	Sign-off and Date
		completed Monthly thereafter			
5	Acceptability Criteria – physical parameters of soil profile – landscape/habitat end-uses	During soil replacement and once completed		Soil Scientist	
6	Acceptability Criteria – physical parameters of soil profile – agriculture end-use	During soil replacement and once completed		Soil Scientist	
Ref	Audit Item / Activity Checks	Frequency	Date Due	Responsible Person	Sign-off and Date
D	**Interpretation of Findings**				
1	Interpretation and reporting of *in-situ* replaced soil physical conditions	To be agreed with Site Environment Lead		Soil Scientist	
E	**Tool Box Talks Delivered**				
1	Why soil resources need to be protected. Where valuable soil resources are located on site. Site restrictions and good practice activities in order to protect soil resources	To be agreed with Site Environment Lead		Soil Scientist	
2	Planning soil management. Access and egress routes	To be agreed with Site Environment Lead		Soil Scientist	
3	Soil stripping. How to identify the difference	To be agreed with Site		Soil	

Ref	Audit Item / Activity Checks	Frequency	Date Due	Responsible Person*	Sign-off and Date
	between soil types. Why soil segregation is important	Environment Lead		Scientist	
4	Demonstration of field technique to assess soil plasticity. Importance of the distinction – vulnerability of wet/plastic soils	To be agreed with Site Environment Lead		Soil Scientist	
5	Soil storage techniques – formation of stockpiles	To be agreed with Site Environment Lead		Soil Scientist	
6	Soil reconditioning techniques – formation of windrows	To be agreed with Site Environment Lead		Soil Scientist	

*Delegated authorities will be confirmed and authorised by the Site Environment Lead

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