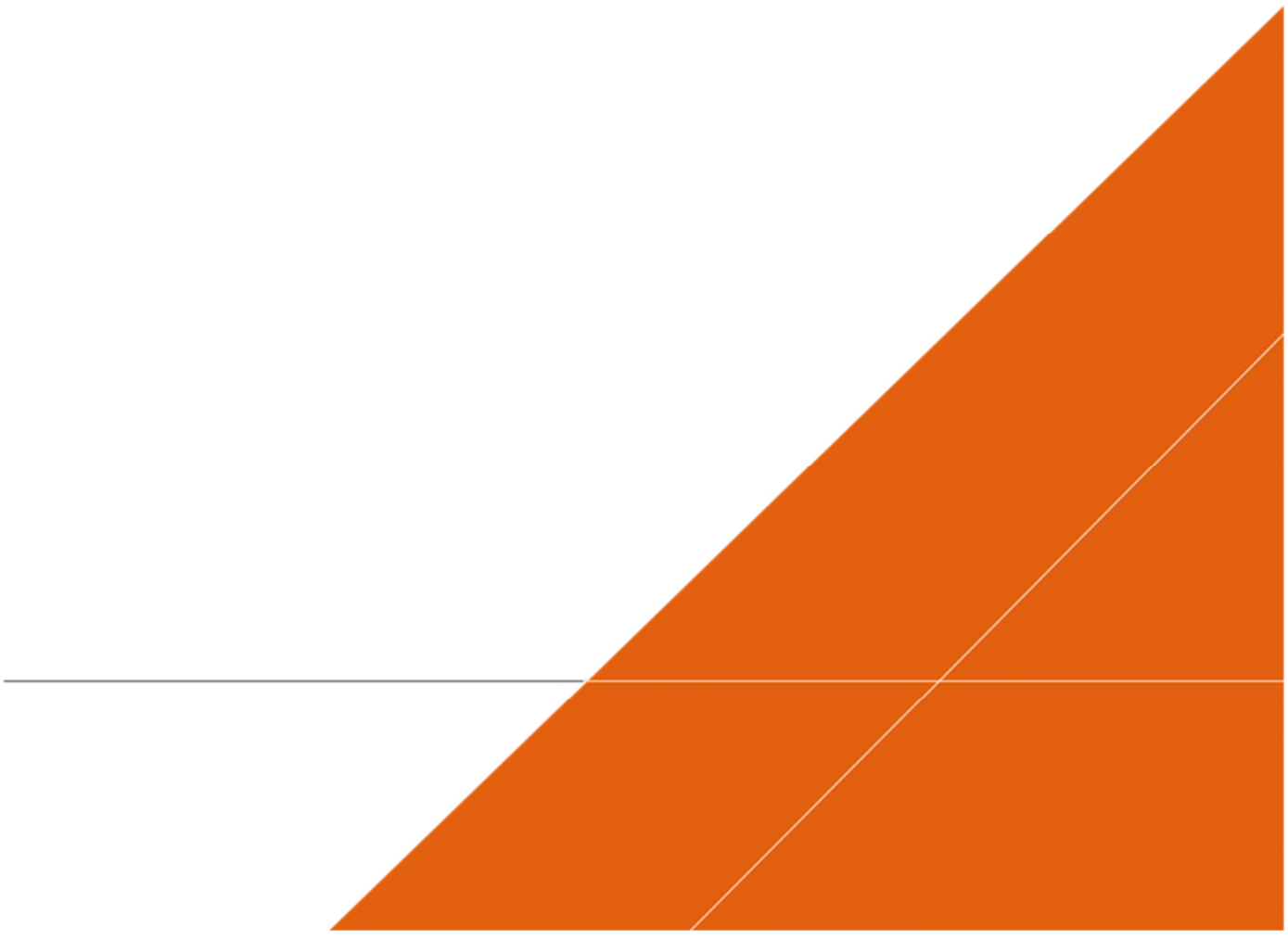
B27

Cotswolds VIP Whittington CSEC

Agricultural Land Classification and Landholding Assessment Report

Document Ref: 30167905-ARC-XX-260-RP-S-00003

JUNE 2024



Version Control

Version	Date	Author	Reviewer	Approver	Changes
V01	03/06/2024	J. Ryan	L. Zhigang	B. Lascelles, N. Hartley	-

Contents

Appendices

1 Introduction

1.1.1 Arcadis was instructed by National Grid to undertake an Agricultural Land Classification (ALC) survey of the wider proposed Cotswolds VIP Project; this reports the survey of the proposed Whittington Cable Sealing End Compound (CSEC). The Proposed Project site (as shown on Figure 1 in Appendix A and hereafter referred to as the 'site') is located to the east of Cheltenham and west of Whittington.

1.1.2 The site forms part of the wider Cotswolds Visual Impact Provision (VIP) Project (hereafter referred to as the 'wider project'), the purpose of which is to underground a section of 400kV overhead electricity transmission lines, to mitigate the visual impact of existing electricity infrastructure through part of the Cotswolds National Landscape (previously known as Area of Outstanding Natural Beauty). The wider project is located immediately south of the B4632 and from Breakheart Plantation, runs in a south-westerly direction to the east of Cleeve Common Site of Special Scientific Interest (SSSI), past Wontley, Drypool and Wood Farms, towards Dowdeswell Wood.

1.1.3 The wider project will comprise:

- The removal of a section of overhead lines (OHL), including the permanent removal of 16 pylons (18 pylons will be removed in total, however, two will be replaced under Permitted Development).
- Underground cabling of approximately 7km in length.
- Two new CSECs at each end (Whittington and Winchcombe) and associated replacement terminal pylons (as mentioned above), to connect the new underground cables to the remaining existing overhead line.
- Associated temporary works to facilitate construction, including temporary/permanent access junctions and roads, a temporary haul road, construction compounds, material storage and welfare facilities.
- Ancillary off-site infrastructure (including installation of arcing horns and shunt reactor installation/connection).

1.1.4 The majority of the works will be undertaken using Permitted Development rights under Schedule 2 of the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended), however, the CSECs require planning permission. The scope of this report is for the Whittington CSEC only (referred to as the 'site').

1.1.5 The site is for the construction of a CSEC at Whittington to facilitate the connection between new underground cables and the existing OHL and the associated permanent access road (and bell-mouth) to the CSEC, in addition to temporary bell-mouths created to support the cable construction along classified roads. The site is located within Cotswold District.

1.1.6 The proposed works within the site boundary comprise:

- CSEC infrastructure;
- Underground cabling from the Whittington CSEC towards the Winchcombe CSEC (note: this is Permitted Development);
- A permanent access road to the CSEC, including a bell-mouth with Ham Road and a turning area;
- A hardstanding area where the overhead line meets with the new underground cables;

- New screening comprising native trees, woodland and scrub planting; and
- Temporary bell-mouths on three classified roads to facilitate construction.
- The terminal pylon for the Whittington CSEC is located outside the CSEC redline (and is Permitted Development).

1.1.7 The scope of this report is to provide details of the soil types, ALC grades of agricultural land and nature of landholdings within the Proposed Project application boundary and assess the potential impacts on these receptors.

2 Agricultural Land Planning Policy and Context

2.1.1 This ALC assessment is consistent with the direction given by paragraph 180 of the National Planning Policy Framework[1] (NPPF) as follows:

"*Planning policies and decisions should contribute to and enhance the natural and local environment by:(b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland*."

2.1.2 The Ministry of Agriculture, Fisheries and Food (MAFF) ALC[2] system of grading the quality of land for planning divides farmland into five grades and two subgrades, according to the degree of limitation imposed upon land use by the inherent characteristics of climate, site and soils.

2.1.3 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 the best and most versatile (BMV) land by the NPPF.

2.1.4 Protecting BMV agricultural land based on a detailed ALC survey is supported by Natural England Guidance to assessing development proposals on agricultural land [3], published in February 2021.

3 Survey Methodology

3.1.1 A desk study to collate baseline information for the site, to include geology, available ALC and soil data and climatic information, was undertaken prior to the survey.

[1] National Planning Policy Framework. Department for Communities and Local Government, December 2023 https://www.gov.uk/government/publications/national-planning-policy-framework--2
[2] 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-guidelines1988.pdf
[3] Agricultural Land Classification: Guide to assessing development proposals on agricultural land. Natural England, February 2021. https://www.gov.uk/government/publications/agricultural-land-assess-proposals-for-development/guide-to-assessing-development-proposals-on-agricultural-land

3.1.2 The ALC survey of the wider project was undertaken on the 1st December 2023. The survey was undertaken with reference to the MAFF revised guidelines and criteria[4] and the Soil Survey Field Handbook: Describing and Sampling Soil Profiles[5]. The maximum soil profile depth was restricted to 100cm following instructions by the client, therefore the required depth of 120cm could not be achieved. Professional judgement was used to conclude this did not pose a limitation on the outcome of the grade assessment; as there was no gleying, slowly permeable layer, sandy subsoil or high stone content recorded in these profiles the ALC grade is possible to confirm within the exposed profile and the characteristics below 100cm would not change the assessed ALC grade. Additionally, limestone bedrock was mostly found to be 30-40cm below ground level; therefore penetration depth of the auger was mostly restricted to 50cm below ground level. Auger bores were mapped using Google Earth prior to entering the field and then geolocated during the survey.

3.1.3 The soil profile at each auger bore was described using the Soil Survey Field Handbook: Describing and Sampling Soil Profiles. Each soil profile was ascribed an ALC grade based on the key criteria listed below (which follows the MAFF ALC Guidelines):

- Climate: Average Annual Rainfall (AAR) and Accumulated Temperature above 0°C between January and June (AT0);
- Site: Gradient, Micro Relief and Flooding; and
- Interactive Factors: Soil Wetness and Soil Droughtiness.

3.1.4 For each soil profiles the following were recorded:

- Soil texture;
- Horizon;
- Stoniness;
- Calcareousness;
- Matrix colour;
- Mottles and mottle colour;
- Structure; and
- Slope.

3.1.5 Within the site there are five auger boring locations (augers 02, 42, 43, 45 and 55) examined and the soil physical properties described. The auger profile descriptions were used to classify the ALC grade within the site as shown in Appendix B. No auger borings were located within 15m either side of known existing utilities.

[4] MAFF (1988). Agricultural Land Classification of England and Wales.

[5] Hodgson, J.M. (2022). Soil Survey Field Handbook: Describing and Sampling Soil Profiles. Cranfield: Cranfield University.

4 Baseline Information

4.1 Land Use

4.1.1 The land use at the time of survey was a grazed grassland field with sheep at auger 42 and 43, arable cropping at augers 45 and 55 and woodland at 02.

4.2 Topography

4.2.1 The site slopes to the south with the altitude falling from 243m to 235m.

4.3 Geology

4.3.1 The British Geological Survey Geology of Britian Viewer[6] shows the site to be underlain by Birdlip Limestone formation which is a white, pale grey and yellow ooidal limestone of ferruginous, sandy, clay and shelly beds.

4.3.2 There is no superficial geology mapped within the site boundary.

4.4 Soils

4.4.1 Available national soil survey[7] information indicates that the soils across the site comprise Elmton 1 and Wickham 2 Associations. Soils of the Elmton 1 Association are described as comprising shallow, well drained brashy calcareous fine loamy soils over limestone, with some similar deeper soils and some non-calcareous and calcareous clayey soils. Soils of the Wickham 2 Association are slowly permeable seasonally waterlogged fine loamy over clayey, fine silty over clayey and clayey soils.

4.5 ALC

4.5.1 MAGIC mapping[8] indicates that the site is entirely mapped as Provisional Grade 3. There are no available detailed ALC survey data within the site.

[6] The British Geological Survey of Britain Viewer: https://webapps.bgs.ac.uk/lexicon/lexicon.cfm?pub=INO [accessed 23 April 2024]
[7] Landis soil association description https://www.landis.org.uk/ [accessed 23 April 2024]
[8] Defra MAGIC maps Magic Map Application (defra.gov.uk) [accessed: 05 January 2024]

4.6 Flood Risk

4.6.1 A review of the Government flood risk service[9] shows that the flood risk of the site is very low (a chance of flooding of less than 0.1% each year) and that flooding from reservoirs and groundwater is unlikely (Flood Zone 1). As such, the chances of flooding are considered to be rare and only for a short period of time, resulting in no limitation to ALC grade within the site.

4.7 Climatic Data

4.7.1 The Climate data required for the ALC assessment are provided for 5km intersections of the National Grid by the Meteorological Office. Interpolated data at Grid Reference SO9913320857 for the site is below.

Table 4-1 ALC Climate Data

Altitude	Average Annual Rainfall AAR (mm)	Accumulated Temperature ATO (day degrees)	Moisture Deficit for Wheat (mm)	Moisture Deficit for Potatoes (mm)	Field Capacity Days (FCD)
240	810	1247	76	58	179

4.8 Agricultural Landholdings

4.8.1 To ensure data use compliance, the farm holding have been anonymised. There are three landholdings identified within the site, CV12 and CV13 are used for grazing and CV11 is used for both grazing and arable cropping. The location and details of the farm holding is presented in Appendices A and C.

5 Agricultural Land Classification

5.1 Climate

5.1.1 The main parameters used in the assessment of whether there is an overall climatic limitation are AAR as a measure of overall wetness, and AT0 as a measure of the warmth in the growing season. According to the values of AAR and AT0 presented in Table 4-1, there is a slight overall climate limitation at the site, with the site having both relatively moderate rainfall and a moderate growing season. As such, climate limits the ALC grade across the site to Grade 2.

[9] Flood Risk: https://check-long-term-flood-risk.service.gov.uk/risk [accessed: 05 January 2024]

5.2 Site Limitations

5.2.1 The gradient across the site is less than 7° with no complex microrelief. As such, gradient and microrelief are not limiting factors.

5.2.2 Flood risk across the site is low and as such flooding is not a limiting factor.

5.3 Soil Limitations

5.3.1 Topsoil textures recorded included medium clay loam, medium silty clay loam, heavy silty clay loam and heavy clay loam, which are not considered to be a direct limiting factor. Subsoil texture and structure affects soil wetness and droughtiness, and the assessments and calculation of wetness and moisture balance of droughtiness are presented in Appendix B.

5.3.2 The soils were shallow and soil depth was the most limiting factor recorded. The soil depths observed at each auger point, and corresponding grade, are shown in Appendix B. The soil depths were recorded as being 20cm - 29cm, resulting in a limitation to Grade 3b (>20cm & <30cm). Soil depth within the woodlands was deeper; however, ALC grade is only assessed for agricultural land.

5.3.3 No chemical limitation was found or observed.

5.4 Interactive Factors

5.4.1 The Wetness Class and grade at each auger location were assessed and are presented in Appendix B. The calculated Wetness Class is I which would result in ALC Grades 2 or 3a in the absence of other limitations. Gleying and slowly permeable layers were not observed.

5.4.2 The survey, soil wetness class assessment and soil droughtiness calculations indicate that soil droughtiness is the second most limiting factor after soil depth. Calculations for moisture balance and droughtiness are presented in Appendix B. An additional 30cm horizon of 20% soil and 80% limestone was added to shallow soils to calculate the droughtiness of the profiles. An extra horizon was included in the calculations as root penetration and water holding capacity are expected to extend past the observed bedrock depth. This assumption is based on prior findings in similar soil types and bedrocks as well as geological data. Root penetration and evidence of water were observed within the shallow pit dug within the wider project survey justifying the addition of an extra horizon in these calculations.

5.4.3 No significant erosion was observed during the survey; as such soil erosion does not comprise a limiting factor.

6 Assessment of Impacts

6.1 Effects on Agricultural Land

6.1.1 The sensitivity of agricultural land is medium as the ALC Grade across the entire site is Grade 3b (non-BMV land). As the total loss of land is less than 5ha the magnitude of impact on agricultural land is minor.

6.2 Effects on Landholdings

6.2.1 As CV12 and CV13 are used for sheep grazing there is limited associated infrastructure and access requirements are infrequent; therefore, the sensitivity is low. CV11 is used for both grazing and arable cropping which, like CV12, has minimal associated infrastructure. However, there is a private water supply located within the site boundary. As such, the severance of this from the rest of the landholding will be investigated to ensure there is no long-term loos of this facility (in discussion with the landowner). The sensitivity of CV11 is therefore considered to be moderate.

6.2.2 The Proposed Project would result in permanent land take of 3.3ha from CV12. The rest of the land within the site boundary is only required temporarily; as such the magnitude of impact is considered to be minor based on the extent of land take and the replacement of the private water supply such that there are no permanent severance impacts.

6.2.3 The overall impact on agricultural landholdings is slight and this is considered to be Not Significant.

7 Conclusions and Recommendations

7.1.1 The ALC grade was Grade 3b across the entirety of the site which comprises a total of 1.9 ha of agricultural land.

7.1.2 The permanent land loss is entirely non-BMV land. The significance of impacts on agricultural land and agricultural landholdings are considered to be Not Significant.

7.1.3 It is recommended that a Soil Management Plan is prepared post-planning consent and implemented during construction to protect agricultural land quality and soil resource, ensuring that good practice measures are implemented for soil stripping, stockpiling and reinstatement. The implementation of good practice construction measures, along with compensation payments, will limit the construction effects.

Appendix A

ALC Grade Distribution, Auger Bore and Site Locations

Legend

CSEC Boundary

ALC Grade

3b

Non- Agricultural

Woodland

Notes:
World Imagery: Maxar, Microsoft
World Topographic Map: Esri UK, Esri, TomTom, Garmin, Foursquare, FAO, METI/NASA, USGS

Rev	Date	Description	Drawn	Check	Approv
01	30/05/24	INITIAL ISSUE	SS	JR	NL

Client:

nationalgrid

PROJECT:
COTSWOLD VIP

Site
Whittington

Client
1-3 Strand
London
WC2N 5EH

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ALC Grade

Designed	J. Ryan	Date: 30 MAY 24	Signed:
Drawn	S. Sarkar	Date: 30 MAY 24	Signed:
Checked	J. Ryan	Date: 30 MAY 24	Signed:
Approved	A. Macdonald	Date: 30 MAY 24	Signed:
Scale:	1:8,000	Datum:	AOD
Original Size:	A3	Grid:	OS
Suitability Code:	S2	Project Number:	30167905

Suitability Description:
For Information

Drawing Number:
30167905-ARC-EGN-ZZ-DR-ZZ-00051

Revision:
P01

Print Date: 06-04-24 10:11:28

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Appendix B

Auger Bore Logs

Auger Bore No	Horizon Top (cm)	Horizon Bottom (cm)	Horizon Thickness	Texture	Matrix Colour	Mottle Colour	Mottle %	Mottle Size	Gley	Depth from Gley (cm)	CaCo3%	Slope	Soft Stone Content	Soft Stone Content % >2mm	Soft Stone Content %>2cm	Soft Stone content %>6cm	Soft Stone Type	Slowly permeable layer (SPL)	Wetness Class	Wetness Grade	Moisture Balance Wheat	Moisture Balance Potato	Droughti-ness Grade	Limitation of Depth Grade	Final ALC Grade	Mapping Grade	AAR	ATO	FCD	MDW	MDP
SA002	0	23	23	hZCl	10 YR 3/2						moderately calcareous	level	few stones	3%	2%	<1%	Soft Limestone	N							**Woodland**	**Woodland**	777	1303	176	83	67
SA002	23	38	15	C	10 YR 4/6						very calcareous	level	few stones	1%			Soft Limestone	N											176	83	67
SA042	0	20	20	mCL	7.5YR 4/3						very calcareous	level	common stones	8%	5%	1%	Soft Limestone	N	I	2	-22.7	-4.7	3a	3b	**3b**	**3b**			180	74	56
SA043	0	25	25	hCL	7.5YR 4/3						very calcareous	level	common stones	15%	5%	2%	Soft Limestone	N	I	3a	-20.5	-1.5	3b	3b	**3b**	**3b**			179	76	58
SA045	0	20	20	hZCL	10YR 3/4						very calcareous	level	common stones	8%	5%	2%	Soft Limestone	N	I	3a	-20.7	-1.7	3b	3b	**3b**	**3b**			179	74	55
SA055	0	24	24	mZCL	10 YR 4/2						very calcareous	level	few stones	5%	3%	1%	Soft Limestone	N	I	2	-5.3	15.7	3b	3b	**3b**	**3b**	820	1203	178	73	54
SA055	24	29	5	hZCL	7.5 YR 4/4						very calcareous	level	few stones	2%			Soft Limestone	N											179	72	53

Texture Key

mCL	**Medium Clay Loam**	**C**	**Clay**	**Below each soil profile it is assumed to be a limestone bedrock**
hCL	**Heavy Clay Loam**	**hZCL**	**Heavy Silty Clay Loam**	**Grey cells indicate subsoil horizons**
mZCL	**Medium Sility Clay Loam**			

Appendix C

Farm Holding Information

Farm Name	Soil Auger bores within farm	Farm Type/Land Use	Infastructure	Severance	Severance	Sensitivity	Magnitude	Significance
CV11	SA045, SA055	Grazing /Arable land	Private Water supply	Yes	Yes - however we will look to address any accommodation works would the landowner require access	M	MINOR	Slight
CV12	SA043	Grazing	Not applicable	Not applicable	Not applicable	L	Negligible	Neutral or slight
CV13	SA042	Grazing	Not applicable	Not applicable	Not applicable	L	Negligible	Neutral or slight

Appendix D

Laboratory Results

ANALYTICAL REPORT

Report Number	**16254-24**	**B106**	**ARCADIS HUMAN RESOURCES LTD**	**Client**	**ARCADIS HUMAN RESOURCES LTD**
Date Received	**03-JAN-2024**		**80 FENCHURCH STREET**		
Date Reported	**18-JAN-2024**		**LONDON**		
Project	**SOIL**		**EC3M 4BY**		
Reference	**ARCADIS HUMAN RESOUR**				
Order Number	**UK2505592**				

Laboratory Reference		**SOIL672584**	**SOIL672585**
Sample Reference		**TS 136**	**USS 136**
Determinand	**Unit**	**SOIL**	**SOIL**
Sand 2.00-0.063mm	% w/w	26	15
Silt 0.063-0.002mm	% w/w	42	55
Clay <0.002mm	% w/w	32	30
Textural Class **		HCL	HZCL

Notes

Analysis Notes

The sample submitted was of adequate size to complete all analysis requested.
The results as reported relate only to the item(s) submitted for testing.
The results are presented on a dry matter basis unless otherwise stipulated.

** Please see the attached document for the definition of textural classes.

Reported by

Teresa Clyne

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