Land North of Ashton Road, Carrington Daines Battery Energy Storage System (BESS)

Peat Survey Report

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Contents

Tables

Appendices

Appendix E Peat Profile Photos

1 Introduction

1.1 Background

1.1.1 Arcadis Consulting (UK) Limited was commissioned by SSE Daines BESS Limited ('the Client'), to undertake a peat depth survey of the land for a proposed Battery Energy Storage System (BESS) development with associated cable route, compound and haul road at Land north of Ashton Road, Carrington in Trafford (**Appendix A**: Auger Bore Plan & Peat Depth Map).

1.1.2 The survey was conducted across two site visits on 8th - 9th January and on 12th February 2025. The survey area is 19.6 hectares (ha).

1.2 Purpose

1.2.1 The aim of the peat survey was to investigate peat depth and stratification to obtain preliminary baseline information to support the future detailed design development and the development of peat mitigation (or compensation as required) strategies where required.

1.2.2 The survey was also undertaken to support consultation with Natural England in response to an objection to Planning Application 115160/FUL/24 raised by Natural England in a letter dated 15 January 2025 (Ref: 497557). The objection raised the following key point:

- *The proposal does not address impacts to on-site restorable peat and would hinder future restoration efforts, beyond the application site, affecting the ability for the wider peat mass to be restored due to potential connecting hydrology.*

1.2.3 Natural England, in their letter of objection, summarised as follows the information and evidence required to overcome the objection:

- *Provision of peat depths overlaid onto the design layout to ensure the development and wider masterplan of Policy JP Allocation 30: New Carrington avoids the loss or deterioration of any irreplaceable habitat such as on and off-site deep restorable peat and informs a suitable compensation strategy, if required*
- *Amendment to the masterplan to avoid the loss and deterioration of habitats contained within locally designated sites and wider Ecological Mitigation Areas of planning application 109755/OUT/22*
- *Tailored and bespoke peat enhancement and compensation design.*

1.2.4 This report provides the required information on peat depths and distribution and provides a summary and recommendations for subsequent actions. It then includes a section providing responses to each point raised by Natural England as far as is possible at this stage in the design of the proposed development.

1.3 Policy and Guidance

1.3.1 The survey was guided by the following national policies and guidance in relation to peat and agricultural land.

1.3.2 Paragraph 187 of the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2025)[1] states that:

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

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

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;

c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;

d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures and incorporating features which support priority or threatened species such as swifts, bats and hedgehogs;

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;".

1.3.3 Footnote 65 of the NPPF states 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".

1.3.4 Paragraph 193 of NPPF states that:

[1] Ministry of Housing, Communities and Local Government (MHCLG) (February 2025). National Planning Policy Framework (NPPF). https://www.gov.uk/government/publications/national-planning-policy-framework--2

"When determining planning applications, local planning authorities should apply the following principles:…c) development resulting in the loss or deterioration of irreplaceable habitats[2] (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists;".

1.3.5 Paragraph 223 of the NPPF states that:

"Planning policies should: a) provide for the extraction of mineral resources of local and national importance, but not identify new sites or extensions to existing sites for peat extraction;...".

1.3.6 Paragraph 224 of the NPPF states that:

"When determining planning applications, great weight should be given to the benefits of mineral extraction, including to the economy. In considering proposals for mineral extraction, minerals planning authorities should:…d) not grant planning permission for peat extraction from new or extended sites;".

1.3.7 The survey adheres to the following guidance:

- England Peat Action Plan (UK Government, 2021)[3];
- Peat Depth Survey Guidance (Nature Scot, 2017)[4];
- Peatland Survey Guidance (Scottish Government, Scottish Natural Heritage, SEPA, 2017)[5];
- Soil Survey Field Handbook (Hodgson, 2022)[6]; and
- Natural England Technical Information Note TIN037(Natural England, 2008)[7];
- Natural England Technical Information Note TIN035- Soil sampling for habitat recreation and restoration (Natural England, 2018) [8]; and
- Natural England Technical Information Note TIN036 -Soil and agri-environment schemes: interpretation of soil analysis (Natural England, 2018)[9].

1.4 Definition of Peat

1.4.1 According to the Soil Survey Field Handbook (Hodgson, 2022) and Natural England Technical Information Note TIN037(Natural England, 2008), peat is defined as a soil as follows:

- "*Peat is a soil texture class. Where >50% organic matter the material is defined as peat.*

[2]Irreplaceable habitat: Habitats which would be technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed, taking into account their age, uniqueness, species diversity or rarity. They include ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen (NPPF, 2024).
[3] UK Government (2021), England Peat Action Plan
[4]NatureScot (2017). Peat Depth Survey Guidance. https://www.nature.scot/survey areas/default/files/2018-03/Guidance-Peatland-Action-Peat-depth-survey-2017-18.pdf
[5] Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. *Guidance on Developments on Peatland,* on-line version only.
[6] Hodgson, J. M (ed). (2022). The Soil Survey Handbook. Soil Survey Technical Monograph No.5, Cranfield
[7] Natural England (2008) Natural England Technical Information Note TIN037, Soil Texture
[8] Natural England (2018) Natural England Technical Information Note TIN035- Soil sampling for habitat recreation and restoration.
[9] Natural England (2018) Natural England Technical Information Note TIN036 -Soil and agri-environment schemes: interpretation of soil analysis.

- *Peaty refers to a soil texture group compromising peat, loamy peat, sandy peat, peaty loam and peaty sand textures.*
- *Peat soil is a soil which meets both of the following criteria:*
    - *More than 40cm of peaty textured material within the upper 80cm of the soil profile and*
    - *Organic mineral or peaty textures present within 30cm depth*."

2 Methodology

2.1.1 Prior to the survey, the following information was reviewed to understand the existing baseline for the survey area and the context within which it is located, and the relevant information on the following aspects is presented in Section 3 of this report.

- Land use;
- Geology;
- Provisional ALC grades;
- National Soil Survey data; and
- Flood risk.

2.1.2 In accordance with Peatland Survey Guidance, the survey was undertaken at a survey density of at least 100m x 100m. Given the size of the site, the survey was undertaken on a 50m survey grid.

2.1.3 A total of 79 survey locations were mapped prior to the field survey, as shown in **Appendix A**: Auger Bore Plan & Peat Depth Map and were uploaded onto a smart phone and tablet via the Google Earth app to locate the auger bore locations in the field.

2.1.4 A 1m long and a 2m long gouge auger (which have a 3cm diameter open end), and a 5m long peat probe, were used to survey peat depth in the pre-mapped auger bore locations. The 2m gouge auger was used at the majority of survey locations to investigate peat texture, stratification and confirm if the base of the peat had been reached, whilst the peat probe was used at all locations to assess peat depth.

2.1.5 Peat humification was assessed at four survey locations in accordance with the von Post scale.

2.1.6 10% hydrochloric acid was used to determine the presence of carbonate, and the Munsell Soil Colour Chart was used to determine soil matrix colours.

2.1.7 Cable Avoidance Tool and Generator (CAT and Genny) was used to scan each auger bore location to avoid buried services before breaking ground. Peat from each auger bore were reinstated after examination.

2.1.8 A total of 13 samples were collected for the analysis of soil organic matter (OM) content, soil nutrients and particle size distribution (i.e. soil texture).

2.1.9 Bulk nutrient samples from fields F1–F4 were collected at a depth of 0–20 cm. The analysis of soil nutrients includes the following items:

- Available phosphorus (P);
- Available potassium (K);
- Available magnesium (Mg);
- pH; and

- Organic matter (OM).

3 Baseline Information

3.1 Land Use

3.1.1 There are six fields within the survey area boundary, of which two are arable fields in the east of the survey area, and four grassland fields in the west of the survey area. For soil nutrients sampling purposes, these six fields were combined into four, identified as fields F1, F2, F3 and F4 as indicated in **Appendix B** Peat Map.

3.2 Topography & Relief

3.2.1 The Ordnance Survey Map[10] indicates that the survey area is generally flat and predominantly within the 21m above sea level contour.

3.3 Flooding

3.3.1 The Government long term flooding risk[11] service was consulted to assess the flooding risk across the survey area. It indicates that the flooding risk from surface water, rivers and the sea in the survey area is very low (a chance of flooding of less than 0.1% each year), and that from groundwater and reservoirs are unlikely.

3.4 Geology

3.4.1 BGS (British Geological Survey) Geology Viewer[12] indicates that the survey area predominately lies over superficial geology comprising Peat with small area in the northeast part of the survey area which comprises Glaciofluvial Sheet Deposits, Devensian - Sand and gravel. The bedrock geology is Wilmslow Sandstone Formation.

3.4.2 Peat is a sedimentary superficial deposit formed between 2.588 million years ago and the present - day during the Quaternary period.

3.4.3 Glaciofluvial Sheet Deposits, Devensian - Sand and gravel is a sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period.

3.4.4 Wilmslow Sandstone Formation – Sandstone, is a sedimentary bedrock formed between 252.2 and 247.1 million years ago during the Triassic period.

[10] Ordnance Survey Map (2019). OS Map of Manchester: Landranger 109
[11] Government long term flooding risk service [accessed 22/01/2025] https://check-long-term-flood-risk.service.gov.uk/risk
[12] BGS (British Geological Survey) Geology Viewer [accessed 22/01/2025] https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/

3.5 Agricultural Land Classification

3.5.1 Agricultural Land Classification - Provisional (England) from Multi-Agency Geographic Information for the Countryside (MAGIC)[13] indicates that the survey area comprises ALC Grade 2. The Provisional mapping is not considered suitable for site-specific assessments; however, it provides an indication of the likely quality of agricultural land. Given the flat topography and the presence of deep soils which are drained it is considered likely that high grade agricultural land will be present.

3.6 Soils

3.6.1 Soils and their use in Midland and Western England[14] indicates that the soils across the majority of the survey area comprise Turbary Moor Association soils with Blackwood Association soils in a small area in the northeast of the survey area.

3.6.2 Turbary Moor Association are deep earthy peat soils. Groundwater in these areas is usually controlled by ditches and pumps. The soils are very acid with high groundwater levels where uncultivated/undrained. There is a high risk of wind erosion when the soil surface is bare.

3.6.3 The Blackwood Association comprises soils which are deep permeable sandy and coarse loamy soils, with groundwater usually controlled by ditches.

[13] MAGIC (Natural England, 2024) https://magic.defra.gov.uk/magicmap.aspx [accessed 24/01/2025].
[14] Ragg, J.M. (1984). Soils and their use in Midland and Western England (Bulletin / Soil Survey of England and Wales).

4 Survey Result

4.1 Peat distribution and type

4.1.1 The survey indicates that the majority of the survey area comprises peat soils (see **Appendix A** Auger Bore Plan & Peat Depth and **Appendix B** Peat Map). The majority of the peat comprises deep peat (depth > 50cm) with soils within field F1 comprising organic loamy sand.

4.1.2 The majority of the peat soil is classified as peat (P) with >50% organic matter throughout the profile (see **Appendix B** Peat Map, **Appendix C** Peat Log and **Table 4-1** Peat Depth and Texture) and these soils cover 80% of the survey area.

4.1.3 The northern edge of field F3 (see auger bores 45–53) comprises a peaty loam (PL) topsoil over medium sandy loam (mSL) or peaty subsoils (comprising 7% of the surveyed area). The northern edge of field F2 (see auger bores 54–59) comprises loamy peat (LP) over peat (comprising 5% of the survey area).

4.1.4 Field F1(auger bores 55a and 60–67a) comprises organic loamy sand (LS) (comprising 8% of the survey area) as the organic matter content is 15.1%-17%. The organic nature and textures of the soils identified during the survey were confirmed by lab analysis of organic matter and soil texture, with some textures adjusted based on the lab results. The lab results are presented in **Appendix D** Laboratory Results.

4.1.5 Fragments of pottery and glass as well as coal were observed during the survey, especially in the field F4. It is considered likely that this is due to the historical use of the area for night soil deposition.

4.1.6 Fields F3 and F4 were under arable use at the time of the survey, whilst fields F1 and F2 were grassland being used for grazing. At the time of the survey, field F4 was under winter wheat, and field F3 was stubble from the previous crop. As the land has been drained and cultivated over a long period of time it is not considered that an acrotelm is present. The peat depth survey indicates that the water table lies below 1.5m below ground level; as such a catotelm should be present within the water table where the peat exceeds 1.5m in thickness.

4.1.7 Details of peat texture, horizon and depth are presented in Table 4-1 below (see also **Appendix A** Auger Bore Plan & Peat Depth, **Appendix B** Peat Map and **Appendix C** Peat Log).

Table 4-1 Peat Depth and Texture

Peat Depth (cm)	Approximate extent of survey area covered by peat at this depth (ha)	% of the survey area	Texture	Approximate extent of survey area covered by peat of this texture area (ha)	% of the survey area
0-50	1.29	6.6%	P	15.7	80.1%

Peat Depth (cm)	Approximate extent of survey area covered by peat at this depth (ha)	% of the survey area	Texture	Approximate extent of survey area covered by peat of this texture area (ha)	% of the survey area
51-100	3.13	16%	LP*	0.92	4.7%
101-150	5.59	28.7%	PL*	1.29	6.6%
151-200	6.78	34.6%	PS	1.48	7.5%
201-250	2.57	13.6%	LS	0.2	1%
251-300	0.06	0.4%			
Survey Area: 19.6 ha		**100%**			**100%**

* only in the surface layer

4.2 Peat Depth

4.2.1 The peat depth across the majority of the survey area exceeds 100cm, covering an area of 15.16ha (77.4%), as shown in Table 4-1. Of this, 5.59ha (28.7%) comprises peat of 101-150cm, 6.78ha (34.6%) comprises peat of 151-200cm depth and 2.57ha (13.6%) comprises peat of 201-250cm. A small area, 0.06ha (0.4%) comprises the deepest peat of 251-300cm.

4.2.2 A section of the cable route and small areas in the north of the survey area have shallower peaty loam and loamy sand soils within 50cm from the ground surface.

4.3 Von Post scale

4.3.1 Four von Post scales of humification were recorded in the field.

4.3.2 The top layer (approximately <50cm; 2.5YR 2.5/1) of peaty, loamy peat and peaty loam soils was recorded as H9 of von Post scale (modified version)[6]. The peat material is almost completely decomposed with no identifiable remains.

4.3.3 The lower horizons of the peat are generally dark red (2.5YR3/6), dark reddish brown (2.5YR3/4) and reddish black (2.5YR2.5/2). These layers were recorded at H6 (well decomposed; indistinct plant structure; most remain unidentifiable), H7 (strongly decomposed; few remain identifiable) and H8 (very strongly decomposed; very indistinct plant structure) on the von Post scales of humification.

4.3.4 This level of humification (decay) of the original plant material will be indicative of the extent of drainage, cultivation and aeration of the peat, increasing rates of decomposition. Whilst it was not possible to confirm the von Post scale readings for peat below 2m depth it is possible that less well decomposed material is still present in the zone where drainage has not had an effect (i.e. a catotelm layer).

4.4 Carbon

4.4.1 Table 4.2 below presents the organic matter content and converted carbon content from the analysed samples against peat texture and area. Carbon (%) was calculated by dividing the organic matter (%) by 1.72.

4.4.2 Organic matter and carbon content increase with peat depth.

Table 4-2 Peat Soil Organic Matter and Carbon

Peat	Organic Matter (%w/w)		Carbon (%w/w)	
	Top layer	Sub layer	Top layer	Sub layer
P	52.3-57.1%	64.5-78.5%	30-33%	37.5-46%
LP	43.9%	64.5-78.5%	26%	37.5-46%
PL	28.5%		17%	

4.5 Nutrients

4.5.1 The nutrient analysis (**Appendix D**: Laboratory Results) indicates that all four fields have moderate to high levels of P and Mg. Fields F2, F3, and F4 have low levels of K, while F1 has a moderate level of K.

4.5.2 Due to moderate to high levels of P, the top layer (0-20cm) of peat is not suitable for species-rich grassland establishment. However, the P level in the peat/soil below the top layer should be low, making it suitable for species-rich grassland establishment. The moderate to high levels of P may be due to farming activities.

4.5.3 All the peat/soils throughout the profile are acidic as indicated by field and lab tests.

5 Conclusion and Recommendations

5.1.1 The survey indicates that the majority of the survey area is peat soil except field F1 where organic loamy sand soils are present. The majority of the survey area comprises deep peat (depth > 50cm).

5.1.2 In total, 80% (15.7ha) of the survey area comprises peat soils.

5.1.3 The extent of each depth range of peat soil across the site is as follows:

- 0-50cm: 1.29ha (6.6%);
- 50-100cm: 3.13ha (16%);
- 101-150cm: 5.59ha (28.7%);
- 151-200cm: 6.78ha (34.6%);
- 201-250cm: 2.57ha (13.6%); and
- 251-300cm: 0.06ha (0.4%).

5.1.4 The top layer (0-20cm) of peat/soils has moderate to high levels of P and is not suitable for species-rich grassland establishment. However, the peat/soil below the top layer should be suitable for species-rich grassland establishment.

5.1.5 In accordance with Peatland Survey Guidance, a detailed assessment of peat extent and conditions (including identification of acrotelm and catotelm) (on a 10mx10m grid) should be conducted post-consent to inform micro-siting, the development of the detailed design and the development of a detailed Peat Management Plan (PMP).The PMP should be substantially based on the outline PMP submitted alongside this report and should be secured through a planning condition and should include the following as a minimum:

- Details of the development and approach to construction;
- Roles and responsibilities;
- Baseline information (to include information gathered through the more detailed resolution peat survey);
- Volumes of peat to be excavated;
- Approach to peat excavation, stockpiling and re-use on site (including requirements for works to stop due to poor weather/ground conditions); and
- [If required] Re-use of surplus peat off-site and details of off-site peatland restoration.

6 Responses to Comments Raised by Natural England

6.1.1 The table below sets out the points raised by Natural England in their letter dated 15 January 2025.

Item	Natural England comment	Project response
01	The proposal contravenes the following policies outlined in the Places for Everyone (PfE) Joint Development Plan: Policy JP Allocation 30: New Carrington (This requires the development site to utilise the findings of hydrological and ground investigation to determine the extent and quality of any peat identified to inform the masterplanning to ensure that the loss or deterioration of any irreplaceable habitat is avoided. Where loss or deterioration is unavoidable, a suitable compensation strategy should be identified and delivered, including the potential restoration of lowland raised bog and complementary habitats elsewhere within the site.)	The requirement of Policy JP Allocation 30 is noted. The peat survey presented in this report provides information on the extent, depth and quality of the peat resource present across the proposed development site. This data shows that the majority of the site comprises deep peat, and as such it would not be possible to alter the masterplan to substantially reduce the overlap between development and peat. It is also important to note that, whilst the site comprises peat as the substrate, the site does not currently support an irreplaceable habitat. This is because the existing above ground habitats present across the site are not directly related to the presence of below ground peat. The existing habitats do not currently class as irreplaceable habitat in line with Natural England's latest list issued in February 2024[15] and as such there is no change required to the masterplan to avoid loss or deterioration of such habitats. However, the project is aware of the significance of peat as both a carbon store and potential carbon sink should it be restored; this is dealt with further at item 02 below. This report includes a recommendation that, post-consent, a further peat survey is undertaken to provide a greater resolution of peat depths and distribution to inform the detailed design. It also recommends that a Peat Management Plan (PMP) is developed. It would be at this point, once the detailed design and proposed construction approach are known, that a final assessment of the impact on the peat resource can be determined and, based on this, the required measures set out in terms of minimising peat excavation, re-use of excavated peat

[15] Natural England, 2024 https://www.gov.uk/guidance/irreplaceable-habitats [accessed 03/03/2025]

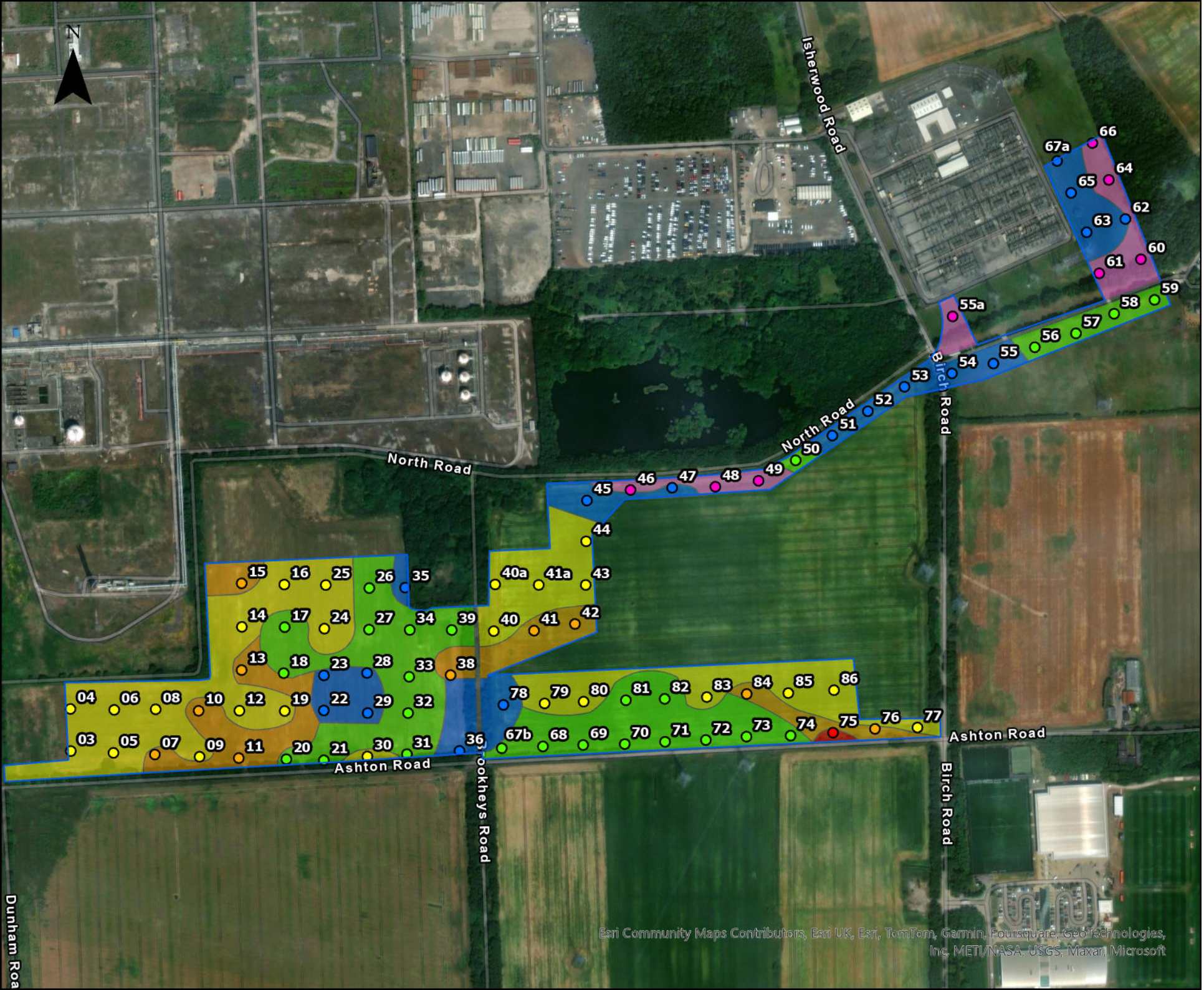
		on- or off-site and, if required, details of off-site peatland restoration. Furthermore, the development would be time limited to 40 years, after which point all above ground infrastructure would be removed and the land would be restored, . In addition, during construction of the cable route, the peat disturbed to lay the cable would be reinstated following cable installation and so there would be no long-term impacts on the peat resource. It should be noted that the site is part of a wider allocation for development and the use of the site for critical energy infrastructure has been accepted by the LPA in principle. The allocation was found sound at Examination on the basis that the public benefit of its development would in principle clearly outweigh the loss or deterioration of the habitat subject to a suitable compensation strategy being delivered (PfE paragraph 11.376). The outline PMP prepared for this proposal and the detailed PMP that would be provided through planning condition would support this wider compensation strategy and set out a suitable approach to compensation and/or restoration.
02	The proposal does not address impacts to on-site restorable peat and would hinder future restoration efforts, beyond the application site, affecting the ability for the wider peat mass to be restored due to potential connecting hydrology.	The Natural England objection letter provides further notes on this, requiring the design of all development within the allocated site to be influenced by avoiding development upon deposits of deep restorable peat and offering suitable bespoke compensation whereby development is unavoidable, to fulfil Policy JP Allocation 30. Therefore, Natural England note that the development proposal may need to consider the wider development allocation masterplan when determining positioning of the development and the potential for suitable compensation habitat. The site, and the peat body, has been affected by agricultural use and associated drainage. The fields across Carrington are often bordered by deep ditches and it is known that agricultural drainage has been installed, at least in parts of the Carrington site. The effect of drainage and repeated cultivation will reduce the waterlogging in the peat, aerate the surface and as such result in increased rates of decomposition.

		This is reflected in the von Post scale recordings, all showing the peat investigated to be highly to well decomposed. It is also notable that the upper peat layer is nutrient-rich, again indicating the influence agriculture has had on this land. Rewetting of any given field should be technically feasible but would need to take into account the effects of trying to raise the water table in a single field on neighbouring fields (or areas of development) which essentially share the same drainage ditches. Given the extent of the land allocated in the local plan across Carrington should off-site compensation be an option, it would be most appropriate to look at the whole of the Carrington Moss peat to find a suitable area which could be restored through rewetting, one which provides the best potential to recreate an active peatland system.
03	Natural England do not support development within or immediately adjacent to wider Ecological Mitigation Areas associated with Planning Application 109755/OUT/22	The masterplan for the proposed development has been co-ordinated with the wider proposed Ecological Mitigation Areas and it is not proposed for any planting or landscaping to be undertaken where the two sites cross. There is also an agreement in place with the landowner to implement the cable route across this area in a co-ordinated programme to minimise impact on the habitats. The outline PMP requires the detailed PMP to include information on hydrological management measures required to protect the existing hydrology and hydrogeology of adjacent land parcel, including the wetland (Shell Pool) at Carrington Moss SBI.
04	Impacts to restorable peat: • Efforts have not been made for evidence to inform the masterplan to avoid impacts to peat	See response to Item 01 – this report provides information on the extent and depth of the peat present. Changes to the masterplan would not materially change the overlap between infrastructure and peat.
	• Concern that peat requires a supply of water to achieve restoration and maintain presence - the proposal requires the extraction of deep peat and	It is noted that any future restoration of peat would require a source of water to enable rewetting. The proposed development is temporary and a PMP will be in place to inform how construction can be

	permanent sealing of peat / interception of water into cabling trenching etc. Development design should not compromise future rewetting and restoration of the peat deposits.	undertaken to minimise impacts, in particular minimising any excavation of peat. Whilst it is not yet possible to confirm the approach to construction, options will be assessed, based on post-consent ground investigation (to include hydrogeological studies as required), and may include: • Piling to avoid/minimise the requirement to excavate peat with the approach to piling such that impacts to groundwater are minimised; • Surcharging ('floating design') to avoid avoid/minimise the requirement to excavate peat; whilst this would result in compaction of the peat and possible hydrogeological changes, the peat would remain in situ should restoration be an option in the future (following decommissioning)
	• Implications for the natural drainage and quality of water within the wider peat assets, beyond the Application Site	Given the prevalence of deep drainage ditches along most field boundaries, the potential for further drawdown/wider hydrogeological impacts as a result of the drainage design are limited.
	• Concerns with the provision of a cess pit to treat foul wastewater due to potential for cracking and/or leaking	Through ongoing consultation with the Environment Agency there has been agreement that either portable loos will be used for the site due to its temporary nature, or if there is a viable foul connection available this will be used. The submission of the detailed foul drainage plan would be included as a pre-commencement planning condition.
05	Natural England summarise the information and evidence required to overcome our objection stance: • Provision of peat depths overlaid onto the design layout to ensure the development and wider masterplan of Policy JP Allocation 30: New Carrington avoids the loss or deterioration of any irreplaceable habitat such as on and off-site deep restorable peat and informs a	Refer to the response provided above at Item 01.

	suitable compensation strategy, if required • Amendment to the masterplan to avoid the loss and deterioration of habitats contained within locally designated sites and wider Ecological Mitigation Areas of planning application 109755/OUT/22 • Tailored and bespoke peat enhancement and compensation design	
06	Soils and agricultural quality	The report notes the likely Agricultural Land Classification grades for the land within the Application Site. The PMP noted above will provide all the information required to ensure the sustainable management of the soils (peat) present (as would be expected to find within a Soil Management Plan). As set out in the Planning Statement NE provisional Agricultural Land Classification (ALC) indicates that the Application Site is potentially Grade 2 agricultural land and therefore the Proposed Development may result in the loss of the BMV agricultural land. It is recognised that the PfE allocates the wider area (including the Application Site) for employment development and that the loss of the BMV agricultural land would occur as a result of the spatial strategy for this area. The LPA has confirmed that the nature of the scheme aligns with the 'urban use' or surrounding land and thus will not require an Agricultural Land Classification Report. It should also be noted that this is a temporary proposed development and there will be a decommissioning requirement to revert the Application Site back into agricultural fields following the end of the operational life. Finally, the Application Site has been historically used for night soils so the quality of the land in this location is lesser compared to land which has not been used for this purpose.

Appendix A Auger Bore Plan and Peat Depth


N
Isherwood Road
North Road
North Road
Birch Road
Birch Road
Ashton Road
Ashton Road
Brookheys Road
Dunham Roa
Survey Area
Survey Points
Peat Depth (cm)
0 - 50
51 - 100
101 - 150
151 - 200
201 - 250
251 - 300
Peat Depth Distribution
Peat Depth (cm)
0-50
51-100
101-150
151-200
201-250
251-300
<all other values>
Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Maxar, Microsoft
0.00 0.01 0.02 0.04 0.06 0.08
Miles

Appendix B Peat Map


N
Isherwood Road
Field 1
Field 2
Field 1
North Road
North Road
Birch Road
Field 3
Field 4
Field 3
Ashton Road
Ashton Road
Brookheys Road
Birch Road
Dunham Roa
Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS, Maxar, Microsoft
Survey Area
Peat (P)
Peaty Loam (PL)
Loamy Peat (LP)
Peaty Sand (PS)
Loamy Sand (LS)
0.02 0.010 0.02 0.04 0.06 0.08
Miles

Appendix C Peat Survey Log

Auger Bore No	Surveyor Initials	Horizon Top (cm)	Horizon Bottom (cm)	Texture	Matrix Colour
1	Not surveyd - not within Site boundary				
2	Not surveyd - not within Site boundary				
3	ZL	0	40	P	5YR 2.5/1
		40	190	P	2.5YR 3/6
4	ZL	0	40	P	5YR 2.5/1
		40	180	P	2.5YR 3/6
5	ZL	0	40	P	5YR 2.5/1
		40	70	P	2.5YR 3/6
		70	170	P	2.5YR 2.5/1
6	JP/ZL	0	20	P	5YR 2.5/1
		20	185	P	2.5YR 3/4
7	ZL	0	40	P	5YR 2.5/1
		40	210	P	2.5YR 3/6
8	JP/ZL	0	25	P	2.5YR 2.5/1
		25	35	P	2.5YR 2.5/1
		35	180	P	2.5YR 3/4
9	ZL	0	40	P	5YR 2.5/1
		40	1.85	P	2.5YR 3/6
10	JP/ZL	0	35	P	2.5YR 2.5/1
		35	205	P	2.5YR 3/4
11	ZL	0	55	P	5YR 2.5/1
		55	210	P	2.5YR 3/6
12	JP/ZL	0	20	P	2.5YR 2.5/1
		20	80	P	2.5YR 3/4
		80	190	P	2.5YR 3/4
13	LH	0	250	P	
14	JP/LH	0	25	P	2.5YR 2.5/1
		25	155	P	2.5YR 3/4
15	JP/LH	0	40	P	2.5YR 2.5/1
		40	230	P	2.5YR 3/4
16	ZL/LH	0	40	P	5YR 2.5/1
		40	165	P	2.5YR 3/6
17	LH	0	150	P	
18	LH	0	150	P	
19	JP/ZL	0	25	P	2.5YR 2.5/1
		25	190	P	2.5YR 3/4
20	ZL	0	25	P	5YR 2.5/1
		25	35	P	2.5YR 3/6
		35	150	P	2.5YR 2.5/1
21	JP	0	100	P	2.5YR 2.5/1
		100	150	mSL	5YR 4/1
22	ZL	0	100	P	2.5YR 2.5/1
23	LH	0	100	P	
24	LH	0	180	P	
25	JP/LH	0	20	P	2.5YR 2.5/1

		20	170	P	2.5YR 3/4
26	ZL/LH	0	39	P	5YR 2.5/1
		39	150	P	2.5YR 3/6
27	ZL/LH	0	38	P	5YR 2.5/1
		38	45	P	2.5YR 3/6
		45	120	P	
28	JP/LH	0	25	P	2.5YR 2.5/1
		25	35	P	2.5YR 3/4
		35	100	P	2.5YR 3/4
29	JP	0	10	P	2.5YR 2.5/1
		10	70	P	2.5YR 2.5/1
		70	75	mSL	5YR 4/1
30	ZL	0	40	P	5YR 2.5/1
		40	120	P	2.5YR 2.5/1
		120	180	P	2.5YR 3/7
31	JP	0	100	P	2.5YR 2.5/1
		100	105	mSL	5YR 4/1
32	ZL	0	110	P	
33	JP/LH	0	30	P	2.5YR 2.5/1
		30	110	P	2.5YR 3/4
34	ZL/LH	0	30	P	5YR 2.5/1
		30	150	P	2.5YR 3/6
35	LH	0	60		
36	ZL	0	20	P	2.5YR 2.5/1
		20	80	P	2.5YR 2.5/1
		80	90	mSL	5YR 4/1
37	Not surveyd - gas pipeline				
38	JP/LH	0	55	P	2.5YR 2.5/1
		55	206	P	2.5YR 3/4
39	JP/LH	0	60	P	2.5YR 2.5/1
		60	150	P	2.5YR 3/4
40	ZL	0	190	P	
40a	ZL	0	185	P	
41	ZL	0	220	P	
41a	JP/ZL	0	100	P	2.5YR 2.5/1
		100	160	P	2.5YR 3/4
42	JP/ZL	0	30	P	2.5YR 2.5/1
		30	50	P	2.5YR 2.5/1
		50	205	P	2.5YR 3/4
43	JP/ZL	0	20	P	2.5YR 2.5/1
		20	190	P	2.5YR 3/4
44	JP/ZL	0	70	P	2.5YR 2.5/1
		70	100	P	2.5YR 2.5/1
		100	160	P	2.5YR 3/4
45	ZL	0	80	PL	
46	ZL	0	45	PL	
47	JP	0	70	PL	2.5YR 2.5/1
		70	72	mSL	2.5Y 6/4

48	JP/ZL	0	49	PL	2.5YR 2.5/1
49	JP/ZL	0	45	PL	2.5YR 2.5/1
50	JP	0	110	PL	2.5YR 2.5/1
		110	120	mSL	2.5Y 6/4
51	JP	0	45	PL	2.5 YR 2.5/1
		45	60	LP	5YR 2.5/1
		60	65	mSL	2.5Y 6/4
52	JP	0	50	PL	2.5YR 2.5/1
		50	55	mSL	2.5YR 3/1
53	JP	0	45	PL	2.5YR 2.5/1
		45	55	P	2.5YR 2.5/1
		55	60	mSL	2.5YR 3/1
54	ZL/LH	0	60	P	
55	ZL	0	60	LP	2.5YR 2.5/1
		60	95	P	2.5YR 3/6
		95		LmS	2.5YR 6/3
55a	ZL/LH	0	23	LmS	
56	JP	0	25	SP	10R 2.5/1
		25	50	LP	10 R 2.5/1
		50	90	P	5YR 2.5/1
		90	150	P	2.5YR 2.5/1
57	JP	0	20	LP	2.5 YR 2.5/1
		20	50	P	2.5YR 2.5/1
		50	100	P	5YR 2.5/1
		100	150	P	5YR 2.5/1
58	JP/LH	0	10	LP	2.5YR 2.5/1
		10	80	P	2.5YR 2.5/1
		50	150	P	5YR 2.5/1
59	ZL/LH	0	10	PS	
		10	110	P	
60	ZL/LH	0	50	LmS	
61	ZL/LH	0	35	LmS	
62	ZL/LH	0	50	LmS	
		50	60	LmS	
63	ZL/LH	0	50	LmS	
		50	60	LmS	
64	ZL/LH	0	48	LmS	
65	ZL/LH	0	70	LmS	
66	ZL/LH	0	50	LmS	
67a	ZL/LH	0	60	mSL	
67b	LH	0	120	P	
68	ZL	0	150	P	
69	ZL	0	150	P	
70	ZL	0	50	P	5YR 2.5/1
		50	120	P	2.5YR 2.5/1
71	ZL	0	30	P	5YR 2.5/1
		30	109	P	2.5YR 2.5/1
72	ZL	0	130	P	

73	LH	0	110	P
74	LH	0	145	P
75	ZL	0	260	P
76	ZL	0	206	P
77	ZL	0	190	P
78	LH	0	95	P
79	LH	0	175	P
80	LH	0	165	P
81	LH	0	125	P
82	LH	0	125	P
83	LH	0	100	P
		100	140	P
		140	160	PS
84	LH	0	215	P
85	LH	0	190	P
86	LH	0	200	P

Appendix D Laboratory Results

ANALYTICAL REPORT

Report Number	**73030-25**	**B106**	**ARCADIS HUMAN RESOURCES**	**Client**	**ARCADIS CONSULTING UK LTD**
Date Received	**13-JAN-2025**		**LTD**		
Date Reported	**22-JAN-2025**		**80 FENCHURCH STREET**		
Project	**SOIL**		**LONDON**		
Reference	**ARCADIS HUMAN RESOUR**		**EC3M 4BY**		
Order Number	**UK2509172**				

Laboratory Reference		**SOIL731603**	**SOIL731604**	**SOIL731605**	**SOIL731606**	**SOIL731607**	**SOIL731608**	**SOIL731609**			
Sample Reference		**07 TOP**	**11 SUB**	**44 LOWER**	**50 TOP**	**56 TOP**	**56 SUB**	**58 TOP**			
Determinand	**Unit**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**			
Organic Matter LOI	% w/w	57.1	67.5	78.5	28.5	43.9	64.6	47.0			

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.

Document Control

Reported by

Gabrielle Parkes

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ANALYTICAL REPORT

Report Number	**73031-25**	**B106**	**ARCADIS HUMAN RESOURCES**	**Client**	**ARCADIS CONSULTING UK LTD**
Date Received	**13-JAN-2025**		**LTD**		
Date Reported	**21-JAN-2025**		**80 FENCHURCH STREET**		
Project	**SOIL**		**LONDON**		
Reference	**ARCADIS HUMAN RESOUR**		**EC3M 4BY**		
Order Number	**UK2509172**				

Laboratory Reference		**SOIL731610**
Sample Reference		**31 TOP**
Determinand	**Unit**	**SOIL**
Coarse Sand 2.00-0.63mm	% w/w	17
Medium Sand 0.63-0.212mm	% w/w	12
Fine Sand 0.212-0.063mm	% w/w	12
Silt 0.063-0.002mm	% w/w	24
Clay <0.002mm	% w/w	35
Organic Matter LOI	% w/w	52.3
Textural Class **		P-C/HCL

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.

Document Control

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

Reported by

Teresa Clyne

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ANALYTICAL REPORT

Report Number	**79639-25**	**B106**	**ARCADIS HUMAN RESOURCES**
Date Received	**18-FEB-2025**		**LTD**
Date Reported	**21-FEB-2025**		**80 FENCHURCH STREET**
Project	**SOIL**		**LONDON**
Reference	**ZHIGANG LIU**		**EC3M 4BY**
Order Number			

Laboratory Reference		**SOIL738317**	**SOIL738318**
Sample Reference		**64**	**65**
Determinand	**Unit**	**SOIL**	**SOIL**
Organic Matter LOI	% w/w	17.0	15.1

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.

Document Control

Reported by

Teresa Clyne

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ANALYSIS REPORT

Contact : ARCADIS HUMAN RESOURCES LTD
80 FENCHURCH STREET
LONDON
EC3M 4BY
Tel. : 02920 926764

B106

Please quote the above code for all enquiries

Client : F1-F4

Local Rep : ZHIGANG LIU

Telephone : 07826 511757

Sample Matrix : Agricultural Soil

Laboratory Reference

Card Number 64981/25

Date Received 18-Feb-25
Date Reported 25-Feb-25

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
352138/25	1	**F1** *No cropping details given*	**6.0**	**2**	**2-**	**2**	**20.6**	**132**	**80**
352139/25	2	**F2** *No cropping details given*	**5.9**	**3**	**1**	**2**	**28.4**	**84**	**82**
352140/25	3	**F3** *No cropping details given*	**5.9**	**3**	**1**	**3**	**34.0**	**79**	**103**
352141/25	4	**F4** *No cropping details given*	**6.0**	**3**	**1**	**2**	**36.0**	**64**	**79**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the AHDB Fertiliser Recommendations RB209 9th Edition.

Released by Sandy Cameron On behalf of NRM Date 25/02/25

ANALYSIS REPORT

DATE **25th February 2025**

SAMPLES FROM **F1-F4**

Report Reference: 64981/25

ARCADIS HUMAN RESOURCES LTD
80 FENCHURCH STREET
LONDON
EC3M 4BY

Tel: 02920 926764

Lab Ref.	Field Details		Soil Organic Matter [LOI%] Result
	No.	Field Name or Reference	
352138	1	F1	13.7
352139	2	F2	22.9
352140	3	F3	39.9
352141	4	F4	49.8

Your Organic Matter Results Interpretation

Land use	Rainfall	Soil type	Very Low	Low	Target	High
Arable	Low <650mm	Light	<=1.0	1.1-2.1	2.2-3.2	>=3.3
		Medium	<=1.7	1.8-3.3	3.4-5.0	>=5.1
		Heavy	<=2.2	2.3-4.4	4.5-6.5	>=6.6
	Moderate 650-800mm	Light	<=1.0	1.1-3.0	3.1-4.5	>=4.6
		Medium	<=1.9	2.0-4.0	4.1-6.0	>=6.1
		Heavy	<= 2.7	2.8-5.2	5.3-7.6	>=7.7
	High 800-1100mm	Light	<=1.3	1.4-3.7	3.8-6.1	>=6.2
		Medium	<=2.5	2.6-5.0	5.1-7.5	>=7.6
		Heavy	<=3.6	3.7-6.2	6.3-8.8	>=8.9
Grassland (Lowland)	All	Light	<=2.1	2.2-4.9	5.0-7.9	8.0-14.9
		Medium	<=3.4	3.5-6.4	6.5-9.3	9.3-19.9
		Heavy	<=4.6	4.7-7.6	7.7-10.5	10.6-19.9

Appendix E Peat Profile Photos

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