

Geotechnical Engineering and Environmental Services across the UK

GEO-ENVIRONMENTAL & GEOTECHNICAL ASSESSMENT (GROUND INVESTIGATION) REPORT

Zone 5 & ESA Harwell Campus Didcot OX11 0FD



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EXECUTIVE SUMMARY

	Site Address	Zone 5 & ESA Harwell Campus, Didcot, OX11 0FD			
tails	National Grid	E: 448164, N: 186576			
e Det	Site Area	8.45ha			
Site	Proposed Development	The proposed development is to comprise the construction of new commercial buildings mainly consisting of offices.			
	Scope of Works	The assessment incorporated a desk study to determine the site's setting to info a preliminary risk assessment followed by an intrusive investigation to confirm t ground and groundwater conditions and support the development of a geotechni and geo-environmental assessment.			
d Conditions		As part of the Desk Study (Jomas, August 2022), it was discovered that there were reports of radioactive waste disposal in a former "Catapult Pit" in the south of site, which was subsequently remediated by the UKAEA. The UKAEA were contacted in the hope of acquiring further information, however, no response was received as and such, Jomas' investigation specifically avoided this feature. Similarly, the historic use of the site (military airbase and UKAEA land) means that there is the potential for radioactivity within soils and potential for radon gas. Advice regarding this should be sought from a specialist consultant.			
counter		Other areas identified as potential hotspots of radioactivity were also purposely avoided as part of Jomas' investigation.			
En	Ground Conditions	The ground conditions encountered beneath a horizon of topsoil (where applicable) comprised Made Ground to depths ranging between 0.2m to >1.2m, over brown sandy gravelly CLAY / firm greyish white gravelly CLAY (Head Deposits) to depths ranging between 0.5m and >2.0m over Structureless CHALK recovered as very stiff greyish white CLAY (Zig Zag Chalk Formation/West Melbury Marly Chalk Formation to a maximum proven depth of 8.8m.			
	Groundwater	Groundwater was not encountered during drilling and subsequent return monitoring.			
Geo-environmental Assessment Summary and Recommendations		Following generic risk assessments, no elevated concentrations of contaminants were detected in soils in excess of generic assessment criteria for the protection of human health within a commercial end-use scenario.			
		No asbestos containing materials or fibres were detected in the Made Ground samples analysed in the laboratory.			
		A significant risk to plant growth has not been identified.			
		The risk to end users associated with vapour risk inhalation from soils is considered negligible.			
		A significant risk to controlled waters has not been identified.			
		Based on the calculated GSVs, and in consideration of the conceptual site model, the site is classified as Characteristic Situation 1 (CS1) and no formal gas protection measures are considered to be necessary.			
		WAC testing has indicated topsoil won't be able to go to an inert tip, as would be expected due to high organic content, but that other natural soils should qualify for			



		this (subject to approva testing once soils are st	al by the landfill op cockpiled).	erator who might re	equest additional	
		Note that a preliminary has not been carried ou Made Ground soils hav Hazardous or Non-haza	waste classification at as this was outsi e therefore not cur ardous for off-site o	on assessment in acc de of our commissic rrently been classific disposal purposes.	cordance with WM3 oned scope of works. ed as being either	
		Based on the ground and groundwater conditions encountered, conventional shallow foundations may be suitable for the proposed development.				
		It is considered that traditional strip/trench-fill foundations up to 1m wide may be formed within the underlying deposits of Chalk at a minimum depth of 0.9m for an allowable bearing capacity of 110kPa. Alternatively, pad foundations with minimum dimensions of 1.2m x 1.2m could be formed, for an allowable bearing capacity of 160kPa. Total and differential settlements should be contained within tolerable limits.				
		Foundations must be deepened to found beneath Made Ground or where building near trees in accordance with NHBC guidance for soils of medium volume change potential (Chalk deposits).				
		Alternatively, a piled foundation would be suitable and indicative pile carrying capacities are given below.				
ıtions	Foundations	To comply with BS EN 1997 and the guidance given by the Federation of Piling Specialists the ground must be proven to a minimum of 5m below the proposed toe of the piles. Consequently, values below 4mbgl are given indicatively in grey italics and a piling specialist should be consulted.				
ē						
nsidera				Pile diameter (mm)		
cal Considera		Pile toe depth (mbgl)	450	Pile diameter (mm) 600	800	
chnical Considera		Pile toe depth (mbgl)	450 Indicative	Pile diameter (mm) 600 e Allowable Pile Capad	800 city (kN)	
eotechnical Considera		Pile toe depth (mbgl) 4	450 Indicative 130	Pile diameter (mm) 600 e Allowable Pile Capad 202	800 city (kN) 320	
Geotechnical Considera		Pile toe depth (mbgl)	450 Indicative 130 224	Pile diameter (mm) 600 e Allowable Pile Capad 202 341	800 city (kN) 320 529	
Geotechnical Considera		Pile toe depth (mbgl) 4 6 8	450 Indicative 130 224 342	Pile diameter (mm) 600 e Allowable Pile Capad 202 341 511	800 city (kN) 320 529 781	
Geotechnical Considera		Pile toe depth (mbgl) 4 6 8 9	450 Indicative 130 224 342 410	Pile diameter (mm) 600 e Allowable Pile Capad 202 341 511 609	800 city (kN) 320 529 781 922	
Geotechnical Considera	Sulphates	Pile toe depth (mbgl) 4 6 8 9 Buried concrete for fou	450 Indicative 130 224 342 410 ndations should be	Pile diameter (mm) 600 e Allowable Pile Capad 202 341 511 609 e designed to Class I	800 city (kN) 320 529 781 922 DS-1 (AC-1).	
Geotechnical Considera	Sulphates	Pile toe depth (mbgl) - 4 6 8 9 Buried concrete for fou Given the presence of s	450 Indicative 130 224 342 410 Indations should be shrinkable soils, it i	Pile diameter (mm) 600 e Allowable Pile Capad 202 341 511 609 e designed to Class I s recommended tha	800 city (kN) 320 529 781 922 DS-1 (AC-1). at suspended floor	
Geotechnical Considera	Sulphates	Pile toe depth (mbgl) 4 6 8 9 Buried concrete for fou Given the presence of s slabs are used with an a	450 Indicative 130 224 342 410 Indations should be shrinkable soils, it i adequate void desi	Pile diameter (mm) 600 Allowable Pile Capac 202 341 511 609 e designed to Class I s recommended that igned according to N	800 city (kN) 320 529 781 922 DS-1 (AC-1). at suspended floor JHBC Standards.	
Geotechnical Considera	Sulphates Ground Floor Slabs	Pile toe depth (mbgl) - 4 6 8 9 Buried concrete for fou Given the presence of s slabs are used with an a As a guide, initial mode 300mm due to the prese (Head deposits).	450 Indicative 130 224 342 410 Indations should be shrinkable soils, it i adequate void desi lling indicates a re sence of shrinkable	Pile diameter (mm) 600 Allowable Pile Capace 202 341 511 609 e designed to Class I s recommended that igned according to N quirement for a sub e soils of high volum	800 city (kN) 320 529 781 922 DS-1 (AC-1). at suspended floor NHBC Standards. -floor void of at least e change potential	
Geotechnical Considera	Sulphates Ground Floor Slabs Excavations	Pile toe depth (mbgl) 4 6 8 9 Buried concrete for fou Given the presence of s slabs are used with an a As a guide, initial mode 300mm due to the prese (Head deposits). Temporary excavations remain stable and some angle is likely to be requ	450 Indicative 130 224 342 410 Indations should be shrinkable soils, it i adequate void desi lling indicates a re sence of shrinkable	Pile diameter (mm) 600 Allowable Pile Capac 202 341 511 609 e designed to Class I s recommended that igned according to N quirement for a sub e soils of high volum Ground and granula ry support or batter	800 city (kN) 320 529 781 922 DS-1 (AC-1). at suspended floor JHBC Standards. -floor void of at least e change potential r soils are unlikely to ing back to a safe	

		Subject to seasonal variations, surface water/groundwater encountered during site works could likely be dealt with by conventional pumping from a sump used to collate waters.	
	Road Pavements	Preliminary CBR design values of 2.5%, 3% and 5% are recommended for pavements constructed within the Made Ground, Head deposits and Chalk, respectively.	
	Surface Water Drainage	 Based on the results of in-situ soil infiltration testing, conventional soakaways may be suitable but infiltration rates have been found to be variable across the site. Therefore, it is recommended that further testing be undertaken at specific location and depths where soakaways are intended to be installed. A drainage engineer should be consulted for design in accordance with the recommendations provided in BRE DG 365 (2016): Soakaway design. 	
Recon Furthe	nmended er Work	 The following works are recommended: Production of a Materials Management Plan (MMP) prior to commencement of works to ensure legal compliance of on-site soil movement; Seek approval of the Generic Quantitative Risk Assessment and Soil Gas Assessment from the Local Authority, NHBC and other relevant stakeholders; Seek confirmation of the water supply pipe requirements by the appropriate service provider. Consult a specialist regarding potential risk of radiological contamination in terms of human health and waste disposal. 	
This D the inv	raft Executive Survestigation. For d	mmary is intended to provide a brief summary of the main findings and conclusions of etailed information, the reader is referred to the main report ref. P4397J2609.	

1 INTRODUCTION

1.1 Terms of Reference

- 1.1.1 Harwell Campus GP Ltd ("The Client") has commissioned Jomas Associates Ltd ('Jomas') to undertake an investigation of the geotechnical and geo-environmental factors pertaining to the proposed development at a site referred to as Zone 5 & ESA Harwell Campus, Didcot, OX11 0FD (herein referred to as 'the site'). The site's location is presented in Figure 1.
- 1.1.2 A Phase 1 Desk Study has been produced for the site and issued separately (detailed in Table 1.1 below), followed by an intrusive investigation (detailed in this report).
- 1.1.3 An intrusive investigation has been undertaken in accordance with Jomas' proposal dated 20 May 2022.

1.2 Proposed Development

- 1.2.1 The proposed development is to comprise the construction of new commercial buildings mainly consisting of offices. No firm design plans have been decided yet but an indicative site layout has been provided and is included as Figure 3 in Appendix 1.
- 1.2.2 For the purpose of geo-environmental assessment and selection of generic assessment criteria, the development is considered "commercial".
- 1.2.3 For the purpose of geotechnical assessment, it is considered that the project could be classified as a Geotechnical Category (GC) 2 site in accordance with BS EN 1997.

1.3 Objectives

- 1.3.1 The objectives of Jomas' investigation are as follows:
 - To undertake an intrusive investigation, to determine the ground and groundwater conditions as well as to assess the nature and extent of contaminants (if any) potentially present at the site;
 - To establish the presence of significant pollutant linkages, in accordance with the procedures set out within Part IIA of the Environmental Protection Act 1990, associated statutory guidance and current best practice including the EA land contamination risk management (LCRM); and,
 - To determine soil properties to inform the preliminary geotechnical assessment for foundations, drainage, excavation stability and recommendations for further action (if required).

1.4 Scope of Works

- 1.4.1 The following tasks were undertaken to achieve the objectives listed above:
 - Intrusive ground investigation to determine shallow ground conditions, and potential for contamination to be present at the site;
 - Undertaking of laboratory chemical and geotechnical testing upon samples obtained;

- Return ground gas/groundwater monitoring;
- The compilation of this report, which collects and discusses the above data, and presents an assessment of the site conditions, conclusions and recommendations.

1.5 Previous Documentation

1.5.1 Prior to the commencement of this investigation Jomas prepared a Desk Study for the site, as detailed in Table 1.1:

Table 1.1: Previous Reports

Title	Author	Reference	Date
Desk Study/Preliminary Risk Assessment Report for Zone 5 & ESA Harwell Campus, Didcot, OX11 0FD	Jomas Associates Ltd	P4397J2609/SC Final v1.0	09 August 2022

1.6 Limitations

- 1.6.1 Jomas has prepared this report for the sole use of Harwell Campus GP Ltd, in accordance with the generally accepted consulting practices and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon by any other party without the explicit written agreement of Jomas. No other third party warranty, expressed or implied, is made as to the professional advice included in this report. This report must be used in its entirety.
- 1.6.2 The records search was limited to information available from public sources; this information is changing continually and frequently incomplete. Unless Jomas has actual knowledge to the contrary, information obtained from public sources or provided to Jomas by site personnel and other information sources, have been assumed to be correct. Jomas does not assume any liability for the misinterpretation of information or for items not visible, accessible or present on the subject property at the time of this study.
- 1.6.3 Whilst every effort has been made to ensure the accuracy of the data supplied, and any analysis derived from it, there may be conditions at the site that have not been disclosed by the investigation, and could not therefore be taken into account. As with any site, there may be differences in soil conditions between exploratory hole positions. Furthermore, it should be noted that groundwater conditions may vary due to seasonal and other effects and may at times be significantly different from those measured by the investigation. No liability can be accepted for any such variations in these conditions.
- 1.6.4 Any reports provided to Jomas have been reviewed in good faith. Jomas cannot be held liable for any errors or omissions in these reports, or for any incorrect interpretation contained within them.
- 1.6.5 This investigation and report has been carried out in accordance with the relevant standards and guidance in place at the time of the works. Future changes to these may require a re-assessment of the recommendations made within this report.
- 1.6.6 This report is not an engineering design and the figures and calculations contained in the report should be used by the Structural Engineer, taking note that variations may apply, depending on variations in design loading, in techniques used, and in site conditions. Our recommendations should therefore not supersede the Engineer's design.

2 DESK STUDY SUMMARY

2.1 Site Information

2.1.1

The site location plan is appended to this report in Figure 1, Appendix 1.

Table 2.1: Site Information

Name of Site	Zone 5 & ESA Harwell Campus
	Harwell
Address of Site	Didcot
	OX11 0FD
Approx. National Grid Ref.	448164 186576
Site Area (Approx)	8.45ha
Site Occupation	Mixed recreational sports field and open space
Local Authority	Vale of White Horse District Council
Proposed Site Use	Commercial, predominantly offices

2.2 Site Walkover

2.2.1

A site Walkover survey was undertaken by Jomas on the 25 July 2022.

Table 2.2: Site Description

Area	Item	Details
On-site:	Current Uses:	The site is a large overgrown grassy field accessible to the public.
		No waste was noted on site.
	Evidence of historic uses:	There was no evidence of historic uses of the site.
	Surfaces:	Much of the site is soft landscaping. There are areas of hard cover predominantly for car parking areas or roadways, predominantly in the south of the site.
		The hard cover is a mixture of concrete, asphalt and block paving.
	Vegetation:	Much of the vegetation around site is either overgrown grass or trees.
		There are a large number of trees around site, with many located along the eastern and northern site boundaries.
		None of the vegetation seen appeared to be exhibiting any evidence of distress.
	Topography/Slope Stability:	Overall, the site reduces in level slightly from south to north.
		A swale is present in the north east of the site.
		Low bunds are located along the north eastern and northern boundary.

Area	Item	Details
	Drainage:	The site appears to be connected to normal drainage facilities. Drain covers are situated around the site.
		No obvious evidence of drainage issues.
	Services:	Streetlights observed along the car park boundary.
		Manhole covers were also observed along the north- eastern and eastern boundary.
	Controlled waters:	No controlled waters were noted on site.
	Tanks:	None observed
Neighbouring land:	North:	Fermi Avenue, Ricardo Energy and Environment and Element Six Global Innovation Centre.
	East:	Newbury Road
	South:	Frome Road and trees.
	West:	Road 7, ongoing construction works at Diamond Light Source and ongoing construction works at/beyond the European Space Agency.

2.2.2 Site photographs taken during the site walkover can be found as Figure 2, in Appendix 1.

2.3 Summary of Preliminary Risk Assessment (Desk Study)

- 2.3.1 As detailed in Table 1.1, a Phase 1 Desk Study report has been produced for the site and issued separately (Jomas Associates Ltd P4397J2609 August 2022). The findings of the Phase 1 Desk Study are presented in the following section. Reference should be made to the original reports and documents for further details. Comments made in the following section regarding possible ground conditions on the site and within the surrounding area are based purely on the desk study. Where appropriate, this information will be used in the later sections of this report as supplementary information to assist in the evaluation of the ground conditions and aid the identification of geotechnical and geochemical constraints and hazards that could impact on the scheme.
- 2.3.2 A review of earliest available (1877) historical map indicates that the site was undeveloped, likely agricultural land. By the map dated 1912, two buildings and a road are shown in the south east of the site. Aerial photography from 1944 indicates the presence of numerous aircraft and runways suggesting a military airfield use. By the 1970s, the runways are no longer shown and a sports field is shown on site. No significant changes then occur up to the most recent maps.
- 2.3.3 The land within which the site is situated was formerly an RAF airfield, before being taken over by the AERE (later UKAEA). A catapult pit located in the south east of Jomas' study site was constructed by the RAF but then used by AERE as a waste transit pit for the storage of radioactive materials, before being backfilled in the 1950s. At the turn of the millennium, UKAEA investigated and subsequently remediated/restored the catapult pit and infilled it with clean material. The feature is still visible on aerial imagery but was not observed during Jomas' walkover.
- 2.3.4 The British Geological Survey indicates that the site is directly underlain by superficial deposits of Head. In the south of site, these superficial deposits are underlain by solid deposits of the Zig Zag Chalk Formation which in turn is underlain by deposits of the West Melbury Marly Chalk

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Formation. These deposits also subcrop in the north-east of site directly under the Head deposits.

- 2.3.5 The superficial deposits underlying the site are identified as a Secondary Undifferentiated Aquifer with both underlying solid deposits identified as Principal aquifers.
- 2.3.6 A review of the Enviro+Geoinsight Report indicates that there are no source protection zones within 500m of the site.
- 2.3.7 There are no active groundwater, surface water or potable water abstractions reported within 1km of the site.
- 2.3.8 There are no surface water features or water networks reported within 250m of the site
- 2.3.9 There are no Environment Agency Zone 2 or Zone 3 floodplains reported within 250m of the site.
- 2.3.10 Correspondence with the Local Authority revealed that they are aware that chlorinated solvent contamination is present in the groundwater beneath the wider Harwell area from chlorinated organic solvents linked to the disposal of chemical wastes into unlined pits.
- 2.3.11 It was recommended that an intrusive investigation be undertaken to clarify potential risks to the identified receptors, and assess the extent of made ground soils present at the site.
- 2.3.12 Soil gas monitoring was not considered necessary given the lack of potential sources of significant ground gas generation.
- 2.3.13 The conceptual site model is reproduced in Table 2.3 overleaf.
- 2.3.14 The catapult pit in the south of site has apparently been remediated, but further information has been requested from UKAEA for details of this.
- 2.3.15 Advice regarding potential radioactivity within soils as a result of past military/UKAEA use should be sought from a specialist consultant.



Sources	Pathways (P)	Pathways (P) Receptors c		Probability of Impact	Risk Estimation	Hazard Assessment
 Potential for contamination associated with previous site use (RAF base/aircraft usage) – on site (S1) Potential for Made Ground associated with removal of previous structures (S2) 	 Ingestion and dermal contact with contaminated soil (P1) Inhalation or contact with potentially contaminated dust and vapours (P2) Permeation of water pipes and attack on concrete foundations by aggressive soil conditions (P6) 	 Construction workers (R1) Maintenance workers (R2) Neighbouring site users (R3) Future site users (R4) Building foundations and on site buried services (water mains, electricity and sewer) (R5) 	Medium	Low	Moderate	GI – Ground Investigation *Assessment relates to typical ground gases of carbon dioxide and
 Bungalow structures in SE of site Runways Infilled catapult pit in south of 	 Accumulation and migration of soil gases (P5) 		Severe	Unlikely*	Low*	methane only. Possible risk associated with radon gas resulting from historic military/atomic energy
 Infilled catapult pit in south of site (S3) Low bunds of unknown composition in north and east of site (S4) Reported chlorinated solvent contamination within groundwater from disposal of waste in unlined pits – off site (S5) 	 Leaching through permeable soils, migration within the vadose zone (i.e., unsaturated soil above the water table) and/or lateral migration within surface water, as a result of cracked hardstanding or via service pipe/corridors and surface water runoff (P3) Horizontal and vertical migration of contaminants within groundwater (P4) 	 Neighbouring site users (R3) Building foundations and on site buried services (water mains, electricity and sewer) (R5) Controlled Waters- Principal aquifer in the Zig Zag Chalk Formation and West Melbury Marly Chalk Formation (R6) 	Medium	Low	Moderate	use may require specialist assessment.

3 GROUND INVESTIGATION

3.1 Scope of Works

- 3.1.1 A ground investigation was undertaken between 7th September and 15th September.
- 3.1.2 A summary of the fieldwork carried out at the site, with justifications for exploratory hole positions, is presented in Table 3.1 below.

Investigation Type	Number of Exploratory Holes Achieved	Exploratory Hole Designation	Depth Achieved	Justification
Windowless Sample Boreholes	8	WS1-8	Max depth 2.00m bgl	Obtain shallow samples for laboratory chemical and geotechnical testing. To allow in-situ geotechnical testing.
Cable Percussion Boreholes	7	BH1-7	Max depth 8.80m bgl	Obtain deeper samples for laboratory geotechnical testing. To allow in-situ geotechnical testing.
Trial Pits	16	TP1-16	Max depth 3.50m bgl	Obtain shallow samples for laboratory chemical and geotechnical testing. TP14 and TP15 were completed to allow inspection of an existing buried utility pipe. To allow soil infiltration testing (see below).
Soil Infiltration Testing	5	TP4, TP6, TP11, TP13 and TP16	Max depth 3.50m bgl	To provide infiltration rates and inform the suitability of soakaways.
CBR Testing by DCP method	12	CBR1-12	Max depth 1m bgl	In-situ geotechnical testing to aid preliminary road/pavement design.
Monitoring Wells	12	BH1-7 WS2, WS3, WS5, WS7 and WS8	Max depth 8m bgl	Gas and groundwater monitoring wells.

Table 3.1: Scope of Intrusive Investigation

- 3.1.3 The ground investigation was undertaken in accordance with British Standard BS5930:2015+A1:2020 "Code of practice for ground investigations", British Standard BS10175:2011+A2:2017 "Investigation of potentially contaminated sites - code of practice", NHBC Standards, Chapter 4.1 and AGS Guidelines for Good Practice in Site Investigations.
- 3.1.4 Exploratory hole positions are shown on the exploratory hole location plan presented in Figure 2, Appendix 1. The exploratory hole records are included in Appendix 2.
- 3.1.5 As part of the Desk Study (Jomas, August 2022further information was sought from UKAEA regarding the apparently remediated "catapult pit". However, no response was received as and such, Jomas' investigation specifically avoided this feature.



3.1.6 Where monitoring well installations were not installed, the exploratory holes were backfilled with the arisings (in the reverse order in which they were drilled) and the ground surface was reinstated so that no depression was left.

3.2 In-situ Geotechnical Testing

- 3.2.1 In-situ geotechnical testing included Standard Penetration Tests. The determined 'N' values have been used to determine the relative density of granular materials and have been used with standard correlations to infer various other derived geotechnical parameters including the undrained shear strength of the cohesive strata. The results of the individual tests are on the appropriate exploratory hole logs in Appendix 2.
- 3.2.2 In-situ California Bearing Ratios (CBRs) were determined using a TRL dynamic cone penetrometer (DCP) and the methodology laid out in IAN 73/06. The CBR values have then been calculated using the methodology laid out in both IAN 73/06 and TRL 587. Copies of the test results and calculations are provided in Appendix 7.
- 3.2.3 The determination of infiltration rates for the underlying ground was undertaken by carrying out tests in general accordance with BRE 365. Copies of the results and calculations are provided in Appendix 6.

3.3 Laboratory Analysis

3.3.1 A programme of laboratory testing, scheduled by Jomas Associates Limited, was carried out on selected samples of Made Ground and natural strata.

Chemical Testing

- 3.3.2 Chemical testing of soils was undertaken by i2 Analytical Limited, which holds UKAS and MCERTS accreditations for a wide range of determinands.
- 3.3.3 The samples were analysed for a wide range of contaminants as shown in Table 3.2 below:

Table 3.2: Chemical Tests Scheduled

	No. of tests		
Test Suite	Made Ground / Topsoil	Natural	
Basic Suite 3	6	8	
Basic Suite 5	6	1	
Hydrocarbon Suite	6	1	
Coal Tar	3	1	
Asbestos Screen & ID	12	0	
Jomas Modified BRE SD-1 Suite	1	14	
Waste Acceptance Criteria	2	2	

3.3.4 The determinands contained in the Basic Suite 3 are as detailed in Table 3.3 below. Basic Suite 5 contains the same determinands but without the hydrocarbon compounds to avoid overlapping with the extended hydrocarbon testing.

3.3.5

The Hydrocarbon Suite includes TPHCWG, PAH, phenols and VOCs including BTEX & MTBE.

DETERMINAND	LIMIT OF DETECTION (mg/kg)	UKAS ACCREDITATION	TECHNIQUE
Arsenic	1	Y (MCERTS)	ICPMS
Cadmium	0.2	Y (MCERTS)	ICPMS
Chromium	1	Y (MCERTS)	ICPMS
Chromium (Hexavalent)	4	Y (MCERTS)	Colorimetry
Lead	1	Y (MCERTS)	ICPMS
Mercury	0.3	Y (MCERTS)	ICPMS
Nickel	1	Y (MCERTS)	ICPMS
Selenium	1	Y (MCERTS)	ICPMS
Copper	1	Y (MCERTS)	ICPMS
Zinc	1	Y (MCERTS)	ICPMS
Boron (Water Soluble)	0.2	Y (MCERTS)	ICPMS
pH Value	0.1 units	Y (MCERTS)	Electrometric
Sulphate (Water Soluble)	0.0125g/l	Y (MCERTS)	Ion Chromatography
Total Cyanide	1	Y (MCERTS)	Colorimetry
Speciated/Total PAH	0.05/0.80	Y (MCERTS)	GCFID
Phenols	1	Y (MCERTS)	HPLC
Total Petroleum Hydrocarbons (banded)	-	N Y (MCERTS)	Gas Chromatography

Table 3.3: Basic Suite of Determinands

3.3.6 The laboratory test results are included in Appendix 3.

Geotechnical Laboratory Testing

- 3.3.7 In addition to the contamination assessment, soil samples were submitted to the UKAS Accredited laboratory of i2 Analytical Ltd. for a series of geotechnical analyses.
- 3.3.8 This testing was designed to classify the samples and to obtain parameters (either directly or sufficient to allow relevant correlations to be used) relevant to the technical objectives of the investigation.
- 3.3.9 The following laboratory geotechnical testing was carried out:



Table 3.4: Laboratory Geotechnical Analysis

Methodology	Test Description	Number of tests
BS1377:1990	Moisture Content Determination	30
BS1377:1990	Liquid and Plastic Limit Determination (Atterberg Limits)	30
BS1377:1990	Particle Size Distribution - Sieving	9
BS1377:1990	Method for saturated moisture content of Chalk	6

3.3.10 In addition, 14No. soil samples were analysed for a modified BRE Special Digest 1 suite (acid and water soluble sulphate, total sulphur and pH) to assist with the ACEC classification for buried concrete.

3.3.11 The laboratory test results are included in Appendix 4.

4 GROUND CONDITIONS ENCOUNTERED

4.1 General

4.1.1 A factual record of the conditions encountered during the physical investigation of the site is presented in the following section.

4.2 Ground Conditions

4.2.1 The ground conditions encountered were broadly consistent with those anticipated, i.e. a thickness of Topsoil overlying superficial deposits of Head over the Zig Zag Chalk Formation and/or West Melbury Marly Chalk Formation, and are summarised in Table 4.1 below.

Table 4.1: Ground Conditions Encountered

Stratum and Description	Encountered from (mbgl)	Base of strata (mbgl)	Thickness range (m)
Brown sandy gravel / gravelly clay with occasional rootlets. Sand is fine to coarse. Gravel consists of fine to coarse, angular to subrounded flint and chalk. (MADE GROUND- TOPSOIL)	0.00 - 0.30	0.2 - 1.2	0.2 - >1.2
Concrete/Asphalt Only encountered within WS1, WS8, TP1, TP2, TP3, TP11 (MADE GROUND)	0.0 - 0.6	0.20 - 0.70	0.10 - 0.30
Gravel comprising angular concrete and asphalt (MADE GROUND) WS8 only	0.20	>1.20 [base not proven]	>1.0 [thickness not proven]
Firm greyish white gravelly CLAY. Gravel consists of asphalt fragments. (MADE GROUND) TP12 only	0.20	0.55	0.35
Brown sandy gravelly CLAY / firm greyish white gravelly CLAY. Sand is fine to coarse. Gravel consists of fine to coarse, angular to subrounded flint and chalk. (HEAD)	0.2 - 0.5	0.5 - >2.0	0.20 - >1.80
Structureless CHALK recovered as very stiff** greyish white CLAY with occasional orange staining. (ZIG ZAG CHALK FORMATION) BH1-BH2, WS2-WS4, TP1-TP4	0.5 - 1.6	>1.5 - >8.8 [base not proven]	>0.4 - >7.5 [thickness not proven]
Structureless CHALK recovered as stiff to very stiff** greyish white CLAY with occasional orange staining. (WEST MELBURY MARLY CHALK FORMATION) BH3 – BH7, WS6-WS7, TP5 – TP14	0.35 - 1.30	>1.5 - >6.3 [base not proven]	>0.70 - >5.00 [thickness not proven]

**Consistency estimated using semi-empirical correlations with SPT N-values, Plasticity Indices and published literature

4.2.2 The depth of Made Ground was not proven within WS1 or WS8. These locations targeted former runways that were in place when the site was utilised by the RAF. The description of



the Made Ground and refusal of windowless sampling drilling equipment in these locations is indicative of the remnants of these historic features.

4.3 Groundwater

- 4.3.1 No groundwater strikes were noted during the intrusive ground investigation.
- 4.3.2 4No. return groundwater monitoring visits were carried out between 21st September and 12th October 2022. The results are presented in Appendix 5 and are summarised below.

Exploratory Hole ID	Depth Encountered (mbgl)	Depth to Base of Well – as gauged (mbgl)	Strata targeted by response zone
BH1	DRY	7.84 - 7.90	Head and Zig Zag Chalk Formation Chalk
BH2	DRY	6.63 - 6.70	Zig Zag Chalk Formation Chalk
BH3	DRY	4.84 - 5.88	Head and West Melbury Chalk Formation
BH4	DRY	5.30 - 5.32	West Melbury Chalk Formation
BH5	DRY	4.41	West Melbury Chalk Formation
BH6	DRY	4.37 - 4.41	West Melbury Chalk Formation
BH7	DRY	4.30 - 4.43	West Melbury Chalk Formation
WS2	DRY	1.71 - 1.77	Zig Zag Chalk Formation Chalk
WS5	DRY	1.90 - 1.93	Head
WS7	DRY	1.75	West Melbury Chalk Formation
WS8	DRY	0.70 - 0.74	Made Ground

Table 4.2: Groundwater Monitoring Summary

4.3.3

It should be noted that changes in groundwater levels can occur for a number of reasons including seasonal effects and variations in drainage. Such fluctuations may only be recorded by the measurement of the groundwater level within a standpipe or piezometer installed within appropriate response zones. Changes in groundwater level can have a direct effect on excavation stability and dewatering requirements, and cohesive soils can soften under rising or high groundwater levels.



4.4 Physical and Olfactory Evidence of Contamination

4.4.1 With the exception of asphalt fragment noted within the Made Ground of WS1, WS8 and TP12, no other visual or olfactory evidence of potential contamination was identified within the investigation positions.

4.5 Limitations

- 4.5.1 During the intrusive ground investigation, the 7No. cable percussive boreholes all refused at depths of between 5m bgl and 8.8m bgl on hard deposits of chalk. The boreholes were terminated after between 30 and 50 minutes of chiselling.
- 4.5.2 As discussed above in paragraph 4.2.2, WS1 and WS8 refused in Made Ground deposits at depths of 0.7m and 1.2m bgl. All other windowless sampling holes refused at 2m bgl due hard deposits of chalk.
- 4.5.3 The possible presence of natural and/or manmade obstructions on site cannot be discounted.

5 RISK ASSESSMENT – ANALYTICAL FRAMEWORK

5.1 Context and Objectives

- 5.1.1 This section seeks to evaluate the level of chronic risk pertaining to human health and the environment which may result from both the existing use and proposed future use of the site. It makes use of the ground investigation findings, as described in the previous sections, to evaluate further the potential pollutant linkages identified in the desk study. A combination of qualitative and quantitative techniques is used, as described below.
- 5.1.2 The purpose of generic quantitative risk assessment is to compare concentrations of contaminants found on site against generic assessment criteria (GAC) to establish whether there are actual or potential unacceptable risks. It also determines whether further detailed assessment is required. The approaches detailed all broadly fit within a tiered assessment structure in line with the framework set out in the Department of Environment, Food and Rural Affairs (DEFRA), EA and Institute for Environment and Health Publication, Guidelines for Environmental Risk Assessment and Management.

5.2 Analytical Framework – Soils

- 5.2.1 There is no single methodology that covers all the various aspects of the assessment of potentially contaminated land and groundwater. Therefore, the analytical framework adopted for this investigation is made up of a number of procedures, which are outlined below. All of these are based on a Risk Assessment methodology centred on the identification and analysis of Source Pathway Receptor linkages.
- 5.2.2 The soil analytical test results have been compared to Suitable 4 Use Levels (S4UL) published by the Chartered Institute of Environmental Health in order to assess the potential long-term risks to human health posed by contaminants in the soils. S4UL'S have been derived for a range of land uses and Soil Organic Matter contents. They represent the minimal or tolerable risk, above which further assessment of the risks or remedial action may be required.
- 5.2.3 In the absence of a S4UL recommended concentration, other available general assessment criteria (GAC), including the Category 4 Screening Levels (C4SL) published by DEFRA have been used. Site-specific assessments are undertaken wherever possible and/or applicable. All assessments are carried out in accordance with the CLEA protocol.
- 5.2.4 The assessment criteria used for the screening of determinands within soils are identified within Table 5.1.



Substance Group	Determinand(s)	Assessment Criteria Selected
Organic Substances		
Non-halogenated Hydrocarbons	Total Petroleum Hydrocarbons (TPHCWG banded)	S4UL
	Total Phenols	S4UL
Polycyclic Aromatic Hydrocarbons (PAH-16)	Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, Benzo(ghi)perylene	S4UL
Volatile Organic Compounds (VOCs/sVOCs).	Toluene, Ethylbenzene, Benzene, Xylenes	S4UL
Inorganic Substances		
Heavy Metals and Metalloids	Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Zinc	S4UL
	Copper, Zinc, Nickel	BS: 3882 (2015).
Cyanides	Free Cyanide	CLEA v1.06
Sulphates	Water Soluble Sulphate	BRE Special Digest 1:2005

Table 5.1: Selected Assessment Criteria - Contaminants in Soils

- 5.2.5 It is understood that the site is to be converted to provide commercial units (mainly offices) with associated soft landscaping. As a result, the site has been assessed with regards to a commercial end use scenario.
- 5.2.6 Published GAC have been selected as those derived assuming a SOM of 1% to allow for a conservative assessment.

5.3 BRE

5.3.1 The BRE Special Digest 1:2005, 'Concrete in Aggressive Ground' is used with soluble sulphate and pH results to assess the aggressive chemical environment of future underground concrete structures at the site.

5.4 Analytical Framework – Groundwater and Leachate

- 5.4.1 The requirement to protect groundwater from pollution is outlined in Groundwater Protection: Principles and Practice (GP3, EA, August 2013, v1.1).
- 5.4.2 Where undertaken, the groundwater quality analysis comprises a Level 1 assessment in accordance with the EA Remedial Targets Methodology Document (EA, 2006).
- 5.4.3 The criteria used by Jomas' in the Level 1 assessment of groundwater and leachate quality are shown in Table 5.2.



Substance Group	Determinand(s)	Assessment Criteria Selected
Metals	Arsenic, Boron, Cadmium, Chromium, Copper, Cyanide, Lead, Mercury, Nickel,	EQS/DWS
	Zinc	EQS
	Selenium	DWS
PAHs	Sum of Four – benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, indeno(1,2,3-c,d)pyrene	DWS
РАН	Anthracene, Naphthalene	EQS
PAHs	Benzo(a)pyrene	EQS/ DWS
PAHs	Remainder	LEC
Total Petroleum Hydrocarbons	Aliphatic C5-C6, Aliphatic >C6-C8, Aliphatic >C8-C10. Aliphatic >C10-C12, Aliphatic >C12-C16, Aliphatic >C16-C21, Aromatic C5-C7, Aromatic >C7-C8, Aromatic >C7-C8, Aromatic >C10-C12, Aromatic >C12-C16, Aromatic >C12-C16, Aromatic >C16-C21,	/wно
	Aromatic> C21-C35	
Benzene	Benzene	EQS/ DWS
Toluene	Toluene	EQS/ WHO
Ethylbenzene	Ethylbenzene	WHO
Xylene	Xylene	EQS/WHO

Environmental Quality Standards EQS

Environmental Quality Standards (EQS) have been released by the EA for dangerous substances, as identified by the EC Dangerous Substances Directive. EQS can vary for each substance, for the hardness of the water and can be different for fresh, estuarine or coastal waters.

WHO Health

These screening criteria have been taken from the World Health Organisation Guidelines for Drinking Water Quality (2017). The health value is a guideline value representing the concentration of a contaminant that does not result in any significant risk to the receptor over a lifetime of exposure.



Further criteria have been obtained from 'Petroleum Products in Drinking-water' - Background document for development of WHO Guidelines for Drinking-water Quality (2005).

UK Drinking Water Standards (DWS)

These comprise screening criteria provided by the Drinking Water Inspectorate (DWI) in the Water Supply (Water Quality) Regulations 2018.

6 GENERIC QUANTITATIVE RISK ASSESSMENT – SOIL DATA

6.1 Screening of Soil Chemical Analysis Results – Human Health Risk Assessment

- 6.1.1 Laboratory analysis for soils is summarised in Table 6.1 to Table 6.4. Raw laboratory data is included in Appendix 3.
- 6.1.2 Results have been screened against generic assessment criteria for a "commercial" end use, assuming 1% soil organic matter.

Table 6.1: Soil Laboratory Test Results - Metals, Metalloids, Phenol, Cyanide

Determinand	Unit	No. samples tested	Screenir	ng Criteria	Min	Max	No. Exceeding
Arsenic	mg/kg	21	S4UL	640	5.9	24	0
Cadmium	mg/kg	21	S4UL	190	<0.2	0.5	0
Chromium	mg/kg	21	S4UL	8600	12	50	0
Lead	mg/kg	21	C4SL	2330	6.4	98	0
Mercury	mg/kg	21	S4UL	320	<0.3	<0.3	0
Nickel	mg/kg	21	S4UL	980	9.4	46	0
Copper	mg/kg	21	S4UL	68000	4	31	0
Zinc	mg/kg	21	S4UL	730000	25	350	0
Total Cyanide ^A	mg/kg	21	CLEA v 1.06	33	<1	<1	0
Selenium	mg/kg	21	S4UL	12000	<1.0	<1.0	0
Boron Water Soluble	mg/kg	21	S4UL	240000	0.4	3.3	0
Phenols	mg/kg	21	S4UL	440	<1	1.2	0

Notes: A Generic assessment criteria derived for free inorganic cyanide.

Table 6.2: Soil Laboratory Test Results - Polycyclic Aromatic Hydrocarbons (PAHs)

Determinand	Unit	No. Samples Tested	Screening Criteria		Min	Max	No. Exceeding
Naphthalene	mg/kg	21	S4UL	190	<0.05	2.8	0
Acenaphthylene	mg/kg	21	S4UL	83000	<0.05	<0.05	0
Acenaphthene	mg/kg	21	S4UL	84000	<0.05	6.5	0
Fluorene	mg/kg	21	S4UL	63000	<0.05	4.5	0
Phenanthrene	mg/kg	21	S4UL	22000	<0.05	46	0
Anthracene	mg/kg	21	S4UL	520000	<0.05	12	0
Fluoranthene	mg/kg	21	S4UL	23000	<0.05	34	0
Pyrene	mg/kg	21	S4UL	54000	<0.05	27	0
Benzo(a)anthracene	mg/kg	21	S4UL	170	<0.05	11	0

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Determinand	Unit	No. Samples Tested	Screening Criteria		Min	Max	No. Exceeding
Chrysene	mg/kg	21	S4UL	350	<0.05	9	0
Benzo(b)fluoranthene	mg/kg	21	S4UL	44	<0.05	8.5	0
Benzo(k)fluoranthene	mg/kg	21	S4UL	1200	<0.05	3.8	0
Benzo(a)pyrene	mg/kg	21	S4UL	35	<0.05	7.4	0
Indeno(123-cd)pyrene	mg/kg	21	S4UL	500	<0.05	2.9	0
Dibenzo(ah)anthracene	mg/kg	21	S4UL	3.5	<0.05	0.85	0
Benzo(ghi)perylene	mg/kg	21	S4UL	3900	<0.05	3.2	0
Total PAH	mg/kg	21	-	-	<0.8	179.5	-

Table 6.3: Soil Laboratory Test Results - Total Petroleum Hydrocarbons (TPH)

TPH Band	Unit	No. Samples Tested	Screening Criteria		Min	Max	No. Exceeding
C8-C10	mg/kg	14	S4UL	2000	<0.1	<0.1	0
>C ₁₀ -C ₁₂	mg/kg	14	S4UL	9700	<2	<2	0
>C ₁₂ -C ₁₆	mg/kg	14	S4UL	36000	<4	<4	0
>C ₁₆ -C ₂₁	mg/kg	14	S4UL	28000	<1	22	0
>C ₂₁ -C ₄₀	mg/kg	14	S4UL	28000	<10	84	0
Total TPH	mg/kg	14	-	-	<17.1	112	-

Note: *The lower value of guidelines for Aromatic/Aliphatics has been selected

Table 6.4: Soil Laboratory Analysis Results - Total Petroleum Hydrocarbons (TPHCWG)

TPH Band	Unit	No. Samples Tested	Screening	Screening Criteria		Max	No. Exceeding
>C5-C6 Aliphatic	mg/kg	7	S4UL	3200	<0.001	<0.001	0
>C ₆ -C ₈ Aliphatic	mg/kg	7	S4UL	7800	<0.001	<0.001	0
>C8-C10 Aliphatic	mg/kg	7	S4UL	2000	<0.001	<0.001	0
>C ₁₀ -C ₁₂ Aliphatic	mg/kg	7	S4UL	9700	<1.0	2.4	0
>C ₁₂ -C ₁₆ Aliphatic	mg/kg	7	S4UL	59000	<2	39	0
>C16-C35 Aliphatic	mg/kg	7	S4UL	1600000	<16	285	0
>C ₅ -C ₇ Aromatic	mg/kg	7	S4UL	26000	<0.001	<0.001	0
>C7-C8 Aromatic	mg/kg	7	S4UL	56000	<0.001	<0.001	0
>C8-C10 Aromatic	mg/kg	7	S4UL	3500	<0.001	<0.001	0
>C ₁₀ -C ₁₂ Aromatic	mg/kg	7	S4UL	16000	<1.0	3.8	0
>C ₁₂ -C ₁₆ Aromatic	mg/kg	7	S4UL	36000	<2	34	0
>C ₁₆ -C ₂₁ Aromatic	mg/kg	7	S4UL	28000	<10	120	0

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TPH Band	Unit	No. Samples Tested	Screening Criteria		Min	Max	No. Exceeding
>C ₂₁ -C ₃₅ Aromatic	mg/kg	7	S4UL	28000	<10	340	0
Total TPH (Ali/Aro)	mg/kg	7	-	-	<20	810	-

6.2 Asbestos in Soil

^{6.2.1 14}No samples of the Made Ground were screened in the laboratory for the presence of asbestos. The results of the analysis are summarised below in Table 6.5 below.

Sample	Screening Result	Quantification result (%)	Comments
WS1 - 0.1mbgl	None Detected	N/A	N/A
WS2 - 0.2mbgl	None Detected	N/A	N/A
WS3 - 0.1mbgl	None Detected	N/A	N/A
WS4 – 0.1mbgl	None Detected	N/A	N/A
WS5 – 0.1mbgl	None Detected	N/A	N/A
WS6 – 0.1mbgl	None Detected	N/A	N/A
WS7 – 0.25mbgl	None Detected	N/A	N/A
WS8 – 0.1mbgl	None Detected	N/A	N/A
WS8 – 1mbgl	None Detected	N/A	N/A
BH1 – 0.5mbgl	None Detected	N/A	N/A
BH2 – 0.3mbgl	None Detected	N/A	N/A
TP2 – 0.5mbgl	None Detected	N/A	N/A
TP3 – 0.4mbgl	None Detected	N/A	N/A
TP12 – 0.3mbgl	None Detected	N/A	N/A

6.2.2 No asbestos containing materials (ACM) or fibres were reported in samples analysed in the laboratory.

6.3 Volatile Organic Compounds

6.3.1 In addition to the suites outlined previously, 7No samples were tested for the presence of volatile organic compounds (VOCs) including BTEX compounds (benzene, toluene, ethylbenzene, xylene).

6.3.2 No VOCs were reported above the laboratory detection limit within any of the samples tested.

6.4 Coal Tar

6.4.1 4No. samples obtained from locations of former runways (WS8, TP2, TP3 and TP12) were analysed for the presence of coal tar, though this was not identified within any of the samples tested.



6.5 Vapour Risk Assessment from a Soil Source

- 6.5.1 As outlined in the tables above, no organic compounds have been found in excess of their generic screening criteria for the protection of human health within a 'commercial' end-use scenario. The generic screening criteria considers all possible pathways between the source and the receptor.
- 6.5.2 Furthermore, no visual or olfactory evidence of hydrocarbon/volatile contamination was reported during the course of the investigation.
- 6.5.3 Therefore, it is considered that there is a negligible risk to end users of the proposed development associated with vapour risk inhalation from soils.

6.6 Summary of Human Health Generic Quantitative Risk Assessment

6.6.1 In summary, no exceedances of contaminants above the GAC were recorded in any of the soil samples tested.

6.7 Screening of Soil Chemical Analysis Results – Potential Risks to Plant Growth

- 6.7.1 Zinc, copper and nickel are phytotoxins and could therefore inhibit plant growth in soft landscaped areas. Concentrations measured in soil for these determinands have been compared with the pH dependent values given in BS:3882 (2015). This does not constitute a full BS:3882 topsoil test.
- 6.7.2 Table 6.6 shows the soil analytical results compared with the relevant screening values, adopting a pH value of greater than 7, as indicated by the results of the laboratory analysis.

Table 6.6: Soil Laboratory Analysis Results - Phytotoxic Determinands

Determinand	Threshold level (mg/kg)	Min (mg/kg)	Max (mg/kg)	No. Exceeding
Nickel	110	9.4	46	0
Copper	200	4	31	0
Zinc	300	25	350	1No
ZINC	500	25	550	WS8 at 0.1mbgl

6.7.3 One sample has recorded Zinc in excess of the threshold level. The current soil in that location may not satisfy the requirements of BS:3882 but as no signs of dieback or vegetation distress were observed, it is not considered to be significantly detrimental to plant growth.

6.8 Screening for Water Pipes Materials

6.8.1 The results of the analysis have been assessed for potential impact upon water supply pipes. Table 6.7 below summarises the findings of the assessment:



Determinand	No. of	Threshold for Polyethylene	Value for sit	te data (mg/kg)	 No of Exceedances 	
Determinand	tests	Pipes* (mg/kg)	Min	Max		
Total VOCs	7	0.5	<0.056	<0.056	0	
BTEX	7	0.1	<0.005	<0.005	0	
MTBE	7	0.1	<0.001	<0.001	0	
EC5-EC10	21	1	<0.006	<0.1	0	
EC10-EC16	21	10	<6	56.2	2No WS8 at 0.5mbgl TP12 at 0.3mbgl	
EC16-EC40	21	500	<11	745	1No TP12 at 0.3mbgl	
Naphthalene	21	5	<0.05	2.8	0	
Phenols	21	2	<1	1.2	0	

Table 6.7: Screening Guide for Water Pipes

* UK Water Industry Research (2010) Source Guidance for Selection of Water Supply Pipes to be Used in Brownfield Sites. Report No. 10/WM/03/21.

6.8.3 The above suggests that upgraded pipe work may be required.

- 6.8.4 Alternatively, it may be possible to utilise other protection methods including (but not limited to):
 - Diversion of the pipe,
 - Localised remediation
 - Embedding the pipe in a sufficient thickness of clean granular material
- 6.8.5 The water supply pipe requirements for this site should be discussed at an early stage with the relevant utility provider.
- 6.9 Assessment of Soil Analytical Data with Respect to Controlled Waters
- 6.9.1 At the Preliminary Risk Assessment (Desk Study) stage, risks to controlled waters were considered moderate.
- 6.9.2 The following controlled waters receptors were identified:
 - Principal aquifer in the Zig Zag Chalk Formation and West Melbury Marly Chalk Formation
- 6.9.3 With reference to Section 4.4, no visual / olfactory evidence of potentially mobile contamination was encountered. Further assessment of the risk to controlled waters is provided in Section 7, with the evaluation of leachate analytical data.

6.10 Waste Characterisation

6.10.1 Waste Acceptance Criteria testing results are summarised in Table 6.8 below.



Sample	Material Type	Exceeds <i>"Inert</i> <i>Waste Landfill</i> " Thresholds?	Exceeds "Stable Non-Reactive Hazardous Waste in Non-Hazardous Landfill" Thresholds?	Exceeds "Hazardous Waste Landfill" Thresholds?	Notes
WS1 at 0.5mbgl	Made Ground	No	No	No	-
WS3 at 0.1mbgl	Topsoil	Yes	No	No	Exceeds inert waste landfill thresholds for pH and TOC
BH3 at 0.6mbgl	Head	No	No	No	-
TP4 at 0.4mbgl	Head	No	No	No	-

Table 6.8: Waste Acceptance Criteria Testing Summary

- 6.10.3 Waste Acceptance Criteria (WAC) testing indicates that topsoil will not be able to be disposed of as inert waste, as would be expected due to high organic content. Made Ground and other natural soils should qualify for inert waste (subject to approval by the landfill operator who might request additional testing once soils are stockpiled.
- 6.10.4 Note that a preliminary waste classification assessment in accordance with WM3 has not been carried out as this was outside of our commissioned scope of works. Made Ground soils have therefore not currently been classified as being either Hazardous or Non-hazardous for off-site disposal purposes.
- 6.10.5 In addition, as recommended within the Desk Study (Jomas, August 2022), a specialist should be consulted regarding potential radioactivity within soils to determine appropriate disposal methods.
- 6.10.6 The above comments are given as guidance and should be confirmed by the waste disposal facility accepting the waste. The waste disposal facility may have their own classification methodology and are under no obligation to honour the comments given above.

7 GENERIC QUANTITATIVE RISK ASSESSMENT – LEACHATE DATA

7.1 Groundwater Sampling

- 7.1.1 11No monitoring wells were installed, and a monitoring visit was conducted on 21st September
 2022 to attempt to obtain samples of groundwater by low flow methodology. However, all the monitoring wells were reported as dry to the base.
- 7.1.2 Subsequently, 5No. soil samples obtained during the initial investigation were submitted for leachate analysis.

7.2 Assessment of Leachate Analytical Data with Respect to Controlled Waters

7.2.1 The results of the laboratory testing are summarised in Table 7.1 to Table 7.2 below and compared to GAC for controlled waters receptors. Analytical laboratory certificates are presented in Appendix 3.

Determinand	Unit	No. samples tested	Screening	Criteria	Min	Max	No of Exceedances
Arconio	µg/l	Г	10	DWS	<1.0	3.3	0
Arsenic	µg/l	5	50	EQS	<1.0	3.3	0
Cadmium	µg/l	-	5	DWS	<0.08	<0.08	0
	μg/l	5 -	0.25	EQS	<0.08	<0.08	0
	µg/l		50	DWS	0.8	16	0
Chromium	μg/l	5	4.7	EQS	0.8	16	1No.: WS8 at 0.5mbgl
	µg/l		10	DWS	2.7	4.4	0
Lead	μg/l	5	1.2*	EQS	2.7	4.4	5No.: WS1 at 0.1mbgl WS6 at 0.5mbgl WS8 at 0.5mbgl BH5 at 0.30mbgl TP1 at 0.4mbgl
	µg/l	5	20	DWS	4	6.1	0
Nickel	μg/l		4*	EQS	4	6.1	4No.: WS1 at 0.1mbgl WS6 at 0.5mbgl BH5 at 0.30mbgl TP1 at 0.4mbgl
Copper	μg/I	5	1.0	EQS	8.7	21	5No.: WS1 at 0.1mbgl WS6 at 0.5mbgl WS8 at 0.5mbgl BH5 at 0.30mbgl TP1 at 0.4mbgl
			2000	DWS	8.7	21	0
Zinc	μg/l	5	10.9*	EQS	8.6	15	3No.: WS1 at 0.1mbgl BH5 at 0.30mbgl TP1 at 0.4mbgl

Table 7.1: Groundwater Laboratory Analysis Results – Metals, Metalloids, Phenol, Cyanide

SECTION 7 GENERIC QUANTITATIVE RISK ASSESSMENT – GROUNDWATER DATA

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Determinand	Unit	No. samples tested	Screening Criteria		Min	Max	No of Exceedances
Morouny	μg/l	5	1.0	DWS	<0.5	<0.5	0
Wercury	μg/l	5	0.07	EQS	<0.5	<0.5	0
Selenium	μg/l	5	10	DWS	<4	9.3	0
Demen	μg/l	F	1000	DWS	10	21	0
Boron	µg/l	5	2000	EQS	10	21	0
	µg/l	F	50	DWS	<10	<10	0
Cyanide (Total)	µg/l	5	1	EQS	<10	<10	0
Phenols (Total)	µg/l	5	7.7	EQS	<10	<10	0

* bioavailable concentration

**bioavailable concentration + ambient background concentration dissolved for Thames Groundwater (2 µg/L)

Table 7.2: Groundwater Analysis Results - Polycyclic Aromatic Hydrocarbons (PAHs)

Determinand	Unit	No. samples tested	Screening	Criteria	Min.	Max.	No. of Exceedances
Naphthalene	μg/l	5	2.0	EQS	<0.01	<0.01	0
Acenaphthylene	μg/l	5	-	-	<0.01	<0.01	0
Acenaphthene	μg/l	5	-	-	<0.01	<0.01	0
Fluorene	μg/l	5	-	-	<0.01	<0.01	0
Phenanthrene	μg/l	5	-	-	<0.01	<0.01	0
Anthracene	μg/l	5	0.1	EQS	<0.01	<0.01	0
Fluoranthene	μg/l	5	0.0063	EQS	<0.01	<0.01	0
Pyrene	μg/l	5	-	-	<0.01	<0.01	0
Benzo(a)anthracene	μg/l	5	-	-	<0.01	<0.01	0
Chrysene	μg/l	5	-	-	<0.01	<0.01	0
Benzo(b)fluoranthene	μg/l	5	0.017	EQS	<0.01	<0.01	0
Benzo(k)fluoranthene	μg/l	5	0.017	EQS	<0.01	<0.01	0
Ponzo(a)nurono	μg/l	5	0.01	DWS	<0.01	<0.01	0
венго(а)ругене	μg/l	5	0.00017	EQS	<0.01	<0.01	0
Indeno(a,h)anthracene	µg/l	5	-	-	<0.01	<0.01	0
Dibenzo(ah)anthracene	µg/l	5	-	-	<0.01	<0.01	0
Benzo(g,h,i)perylene	µg/l	5	0.0082	EQS	<0.01	<0.01	0
Sum of four Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(ghi)perylene Indeno(123-cd)pyrene	μg/I	5	0.1	DWS	<0.04	<0.04	0



- 7.2.2 In addition to the suite outlined above, the 5No.samples were also analysed for TPHCWG and suite of volatile organic compounds (VOCs) including BTEX compounds. None of the compounds analysed for were reported above the laboratory method detection limit.
- 7.2.3 Concentrations of chromium, lead, nickel, copper and zinc were found to exceed environmental water quality standard.
- 7.2.4 The only controlled waters receptors identified by the preliminary risk assessment were the Principal Aquifers within the Zig Zag Chalk Formation and West Melbury Marly Chalk Formation. As no groundwater was reported during drilling or subsequent monitoring (to a depth of 8m), and no nearby surface water features or abstractions have been identified, a significant risk to controlled waters has not been identified.

8 SOIL GAS RISK ASSESSMENT

8.1 Soil Gas Results

- 8.1.1 Four return monitoring visits have been undertaken between 21 September 2022 and 12 October 2022, to monitor wells installed within boreholes at the site for soil gas concentrations and groundwater levels.
- 8.1.2 During these visits atmospheric pressure ranged between 987mb and 1012mb. During these visits pressure trends observed were generally falling.
- 8.1.3 At the request of the client, installed wells BH5 and WS7 were backfilled with bentonite, headworks removed, and ground surface reinstated with surrounding soil after the first monitoring visit.
- 8.1.4 The results of the monitoring undertaken are summarised in Table 8.1 below, with the monitoring records presented in Appendix 5.

Hole No.	Number of monitoring events	CH₄ (%)	CO2 (%)	O₂ (%)	VOCs (ppm)	Steady Flow Rate (l/hr)	Peak Flow Rate (I/hr)	Depth to water (mbgl)	Well Response Zone as installed (top/bottom) (mbgl)	Strata targeted by response zone
BH1	4	0.0-0.2	0.8 - 1.6	19.2 – 20.2	0.0-0.3	-0.3 - +0.3	-0.5 - +0.3	Dry	0.8 to 8	Head and Zig Zag Chalk Formation Chalk
BH2	4	0.0-0.1	0.1-0.3	20.1-21.3	0.0-0.3	-0.1 - +0.2	-0.1 - +0.2	Dry	1 to 8	Zig Zag Chalk Formation Chalk
BH3	4	0.0-0.1	0.7 – 0.8	20.2 – 20.7	0.0 - 1.0	-0.0 - +0.2	-0.0 - +0.2	Dry	1 to 5	Head and West Melbury Chalk Formation
BH4	4	0.0-0.2	0.1-0.4	20.2 – 20.9	0.0-0.3	+0.0 - +0.2	+0.0 - +0.2	Dry	1 to 5.5	West Melbury Chalk Formation
BH5*	1	0.0	0.9	20.4	0.0	+0.2	+0.2	Dry	1 to 4.7	West Melbury Chalk Formation
BH6	4	0.0-0.1	0.0	19.9 – 20.7	0.0-0.3	+0.0 - +0.1	+0.0 - +0.1	Dry	1 to 5	West Melbury Chalk Formation
BH7	4	0.0-0.1	0.6 - 1.3	19.8 – 20.5	0.0 -13.5	+0.0 - +0.2	+0.0 - +0.2	Dry	1 to 5	West Melbury Chalk Formation
WS2	4	0.0-0.2	0.6 - 0.9	20.3 - 21.8	0.0-0.4	+0.0 - +0.2	+0.0 - +0.2	Dry	1 to 2	Zig Zag Chalk Formation Chalk
WS5	4	0.0-0.1	0.7 - 2.3	19.2 - 20.8	0.0-0.2	-0.1 - +0.2	-0.1 - +0.2	Dry	1 to 2	Head
WS7*	1	0.0	0.9	20.5	0.0	+0.3	+0.3	Dry	1 to 2	West Melbury Chalk Formation
WS8	4	0.0-0.2	0.0 - 0.1	20.7 - 20.9	0.0 - 0.4	+0.0 - +0.2	+0.0 - +0.2	Dry	0.5 to 1	Made Ground

Table 8.1: Summary of Gas Monitoring Data

* wells removed on 21/09/22

8.2 Screening of Results

- 8.2.1 As shown in Table 8.1, the maximum concentrations of methane and carbon dioxide recorded were 0.2% and 2.3% v/v respectively. The maximum concentration of Volatile Organic Compounds measured was 13.5 ppm. The maximum gas flow rate recorded was -0.5l/hr.
- 8.2.2 The soil gas assessment method is based on that proposed by Wilson & Card (1999), which was a development of a method proposed in CIRIA publication R149 (CIRIA, 1995). The method uses both gas concentrations and borehole flow rates to define a characteristic situation based on the limiting borehole gas volume flow for methane and carbon dioxide. In both these methods, the limiting borehole gas volume flow is renamed as the Gas Screening Value (GSV).
- 8.2.3 The Gas Screening Value (litres of gas per hour) is calculated by using the following equation

GSV = (Concentration/100) X Flow rate

Where concentration is measured in percent (%) and flow rate is measured in litres per hour (I/hr)

- 8.2.4 In accordance with CIRIA C665, worst case conditions are used in the calculation of GSVs for the site. These have been summarised below in Table 8.2.
- 8.2.5 The Characteristic Situation is then determined from Table 8.5 of CIRIA C665.

Gas	Concentration (v/v %)	Peak Flow Rate (l/hr)	GSV (l/hr)	Characteristic Situation (after CIRIA C665)
CO2	2.3	0.5	0.0115	CS1
CH₄	0.2	0.5	0.001	CS1

Table 8.2: Summary of Gas Monitoring Data and Gas Screening Value

- 8.2.6 Based on the calculated GSVs, and in consideration of the conceptual site model, the site is classified as Characteristic Situation 1 (CS1) and no formal gas protection measures are considered to be necessary.
- 8.2.1 BS 8576:2013 has been used to derived threshold levels for carbon monoxide and volatile organic compounds.
- 8.2.2 Given the recorded levels it is not considered that additional protection measures need to be incorporated to protect end users from the recorded carbon monoxide concentrations.
- 8.2.1 PID screening of the monitoring well headspace has revealed maximum concentrations of VOCs of 13.5ppm. No visual or olfactory evidence of hydrocarbon contamination was observed during the investigation, and no VOCs were reported above laboratory detection limits in soil or leachate analyses. Therefore, it is considered that the PID screening of monitoring wells confirms the assessment that risks to human health receptors via vapour inhalation pathways are negligible.


8.2.2 As noted within the Desk Study (Jomas, August 2022), sources of radon gas may be present beyond the natural background level for the surrounding area due to the site history and association with potentially radioactive materials. This should be assessed further by suitably qualified personnel prior to determining whether newly built structures require radon protection.

9 GEO-ENVIRONMENTAL ASSESSMENT SUMMARY AND RECOMMENDATIONS

9.1 Land Quality Impact Summary

- 9.1.1 Following the ground investigation, the following is noted:
 - It is understood that the proposed development is to comprise the construction of new commercial buildings mainly consisting of offices.
 - Following generic risk assessments, no elevated concentrations of contaminants were detected in soils in excess of generic assessment criteria for the protection of human health within a commercial end-use scenario.
 - No asbestos containing materials or fibres were detected in the Made Ground samples analysed in the laboratory.
 - Any visual asbestos materials may be removed by hand, with extensive dust control measures required during the soil screening operations for the protection of site workers and nearby residents. It should be noted that asbestos fibres will not be visible to the naked eye.
 - A significant risk to plant growth has not been identified.
 - The risk to end users associated with vapour risk inhalation from soils is considered negligible.
 - A significant risk to controlled waters has not been identified.
 - Based on the calculated GSVs, and in consideration of the conceptual site model, the site is classified as Characteristic Situation 1 (CS1) and no formal gas protection measures are considered to be necessary.
 - As with any ground investigation, the presence of further hotspots between sampling points cannot be ruled out. Should any contamination be encountered, a suitably qualified environmental consultant should be informed immediately, so that adequate measures may be recommended.
 - WAC testing indicates most may be disposed of as inert waste. However, a hazardous
 waste assessment has not been undertaken. In addition, a specialist should be consulted
 regarding the potential radioactivity within soils to determine appropriate disposal
 methods.
 - Following the land contamination assessment, no further assessment or risk mitigation is required, and the site can be considered suitable for the proposed use. However, further assessment may be required regarding potential radioactivity within soils as a result of past military/UKAEA use, and advice should be sought from a specialist consultant.
 - As with any ground investigation, the presence of further hotspots between sampling points cannot be ruled out. Should any contamination be encountered, a suitably

qualified environmental consultant should be informed immediately, so that adequate measures may be recommended.

9.1.2 The above conclusions are made subject to approval by the statutory regulatory bodies.

9.2 Review of Pollutant Linkages Following Ground Investigation

9.2.1 The site CSM has been revised and updated from that suggested in the desk study in view of the ground investigation data, including soil laboratory analysis results. Table 9.1 highlights whether pollutant linkages identified in the original CSM are still relevant following the risk assessment, or whether pollutant linkages, not previously identified, exist.

SECTION 9 GEO-ENVIRONMENTAL ASSESSMENT SUMMARY AND RECOMMENDATIONS



Potential Source (from desk study)	Pathway	Receptor	Relevant Pollutant Linkage?	Comment
 Potential for contamination associated with previous site use (RAF base/aircraft usage) – on site (S1) Potential for Made Ground associated with removal of previous structures (S2) Bungalow structures in SE of site Runways Infilled catapult pit in south of site (S3) 	 Ingestion and dermal contact with contaminated soil (P1) Inhalation or contact with potentially contaminated dust and vapours (P2) Permeation of water pipes and attack on concrete foundations by aggressive soil conditions (P6) 	 Construction workers (R1) Maintenance workers (R2) Neighbouring site users (R3) Future site users (R4) Building foundations and on site buried services (water mains, electricity and sewer) (R5) 	Y	See section 9.1 above for remedial measures. The findings of this report should be included in the construction health and safety file, with adequate measures put in place for the protection of construction and maintenance workers. Contact should be made with relevant utility providers to confirm if upgraded materials are required. The concrete classification to protect buried concrete is discussed in Section 11.3Error! Reference source not found.
 Low bunds of unknown composition in north and east of site (S4) 	 Accumulation and migration of soil gases (P5) 		N	Site has been characterised as CS1 and no gas protection measures are deemed necessary.
 Reported chlorinated solvent contamination within groundwater from disposal of waste in unlined pits – off site (S5) 	 Leaching through permeable soils, migration within the vadose zone (i.e., unsaturated soil above the water table) and/or lateral migration within surface water, as a result of cracked hardstanding or via service pipe/corridors and surface water runoff (P3) Horizontal and vertical migration of contaminants within groundwater (P4) 	 Neighbouring site users (R3) Building foundations and on site buried services (water mains, electricity and sewer) (R5) Controlled Waters-Principal aquifer in the Zig Zag Chalk Formation and West Melbury Marly Chalk Formation (R6) 	N	A significant risk to controlled waters has not been identified. The concrete classification to protect buried concrete is discussed in Section 11.3

Table 9.1: Plausible Pollutants Linkages Summary (Pre-Remediation)



10 DERIVATION OF GEOTECHNICAL PARAMETERS

10.1 Introduction

10.1.1 A summary of ground conditions obtained from the ground investigation and the derived geotechnical parameters is provided below.

10.2 Plasticity of Cohesive Materials

- 10.2.1 Atterberg Limit determination was undertaken on 30No. samples of Head, Zig Zag Chalk formation and West Melbury Marly Chalk Formation, at depths ranging from 0.5 to 9mbgl.
- 10.2.2 Plasticity Index values in deposits of head ranged from 13% to 55% and were indicative of low to very high plasticity, as illustrated in Figure 10.1 below.
- 10.2.3 Plasticity Index values in the Zig Zag Chalk Formation ranged from 16% to 24% and were indicative of medium plasticity, as illustrated in Figure 10.1 below.
- 10.2.4 Plasticity Index values in the West Melbury Marly Chalk Formation ranged from 17% to 29% and were indicative of medium to high plasticity, as illustrated in Figure 10.1 below.
- 10.2.5 Modified Plasticity Index values in deposits of head ranged from 7.28% to 45.1%, indicating the presence of both non-shrinkable soils and those with a low to high volume change potential.
- 10.2.6 Modified Plasticity Index values in the Zig Zag Chalk Formation ranged from 16% to 24%, indicating soils with low to medium volume change potential.
- 10.2.7 Modified Plasticity Index values in the West Melbury Marly Chalk Formation ranged from 11.5% to 29%, indicating soils with low to medium volume change potential.





Figure 10.1: Plasticity Chart

10.3 Standard Penetration Tests

- 10.3.1 Standard Penetration Tests were undertaken at regular intervals throughout the windowless sample boreholes and cable percussive boreholes. The results of the SPTs are plotted against depth in Figure 10.2 below.
- 10.3.2N_{equi} results have been calculated where the full 300mm of penetration could not be achieved
for 50 or more blows. Where the penetration after 50 blows is low due to the presence of hard
strata, the test is deemed to be a refusal and no value is calculated.





Figure 10.2: SPT 'N' Value v Depth

10.3.3 The results show a general trend of increasing N value with depth.

10.4 Undrained Shear Strength

10.4.1 Figure 10.3 below shows the undrained shear strength inferred by the correlation suggested by Stroud (1974);

 $c_u = f_1 \times N$ can be applied,

in which c_u= mass shear strength (kN) f₁ = constant N= SPT Value achieved during boring operations

- $10.4.2 \qquad \mbox{ In the above equation } f_1 \mbox{ is dependent on the plasticity of the material that the SPT is being carried out in. As the plasticity indices were shown to be greater than 25% a value for f_1 of 4.5 has been adopted after Tomlinson (2001). }$
- 10.4.3 The graph below shows the shear strength profile of the encountered cohesive materials at the site, based on the SPT to shear strength correlation described above.





Figure 10.3: Undrained Shear Strength v Depth

- 10.4.4 It should be pointed out that the correlation between SPT 'N' value and undrained shear strength of weathered chalk is based on the material being recovered as structureless, stiff to very stiff clay. In reality, correlation can vary greatly, as pointed out in CIRIA R143, and therefore the results should be treated with some circumspection.
- 10.4.5 Rotary drilling, including the retrieval of cores, may allow for unconfined compressive strength testing of chalk specimens, to provide a more accurate measurement of the compressive strength of chalk.

10.5 Coefficient of Compressibility

10.5.1 Stroud and Butler (1974) developed a relationship between the coefficient of compressibility (m_{ν}) and SPT 'N' value.

 $m_v = 1/f_2 \times N$ can be applied,

in which m_v = coefficient of compressibility (m²/MN) f_2 = constant dependant on the plasticity index N = SPT Value achieved during boring operations



10.5.2 Using the plasticity indices obtained and the graphs provided in Tomlinson (2001) a value of f_2 of 0.45 has been taken and used with the SPT 'N' values to infer coefficient of compressibility (m_v).



Figure 10.4: Coefficient of Volume Compressibility (m_v) v Depth

- 10.5.3 At shallow depth, the results indicate soils of low to medium compressibility, becoming soils of very low compressibility with increasing depth.
- 10.5.4 The reduction in compressibility is as would be expected for a material which is completely weathered structureless rock.
- 10.5.5 It should be noted that the settlement of chalk is likely to be controlled by the stiffness of the material.

10.6 Bulk Density

10.6.1 In the absence of geotechnical laboratory test results, the correlations and suggested values for both cohesive and granular materials given in BS8004:2015 have been used. The derived bulk densities are summarised below in Table 10.1.

Table 10.1: Derived Bulk Densities

Strata	Unit Weight (kN/m³)	
Made Ground	17	



Strata	Unit Weight (kN/m³)
Head	18
Zig Zag Chalk Formation	20
West Melbury Marly Chalk Formation	20

10.7 Effective Angle of Shearing Resistance / Angle of Friction

10.7.1 In cohesive soils, the effective angle of shearing resistance can be derived from the plasticity index of the soil, using the following equation presented in BS8004:2015.

$$\phi' = 42 - (12.5 x LOG 10(PI))$$

Where PI = Plasticity Index.

10.7.2 Values have been calculated for all available Plasticity Index results and are presented inTable 10.2.

Table 10.2 Derived Angles of Shearing Resistance

Stratum	Derived Angle of Shearing Resistance (°)
Head	20.2 – 28.1
Zig Zag Chalk Formation	24.7 - 26.9
West Melbury Marly Chalk Formation	23.7 – 26.6

10.7.3 In granular materials, the effective angle of friction can be derived directly from shear box testing, or indirectly using the methodology outlined in Table 1 of BS8004:2015, using a combination of the SPT N-Values, Particle Size Distribution of the soil, and the field descriptions of angularity of the gravel fraction. This method assumes that the fines content of the material is less than 15%. An alternative method is to refer to the correlation between angle of friction and SPT N-values postulated by Peck *et al* (1967) and reproduced in Tomlinson (2001).

10.8 Stiffness Moduli

10.8.1 In cohesive materials, the undrained stiffness modulus (Young's Modulus) can be derived using the correlation with SPT N-Values, presented in CIRIA Report R143.

 $\underline{Eu} = 1.2 * N$

10.8.2 The drained Young's Modulus for cohesive material (with the exception of London Clay) can also be derived from the SPT-N values, as follows:



E' = 0.9N

10.8.3 In granular materials, the drained Young's Modulus can be derived using the following correlation:

E' = N

10.8.4 In chalk, the SPT can be used to provide a rough estimate of settlements, which are dependent on the stiffness of the material. CIRIA R143 refers to a correlation by Stroud which provides a conservative estimate of settlement, on the basis that

E' = 5N

10.9 Summary of Derived General Properties

10.9.1 Based on the analysis of the ground investigation data and past experience with similar deposits, the following derived general parameters are given in Table 10.3.

Property*	Head Deposits	Zig Zag Chalk Formation	West Melbury Marly Chalk Formation
Unit Weight ¹⁾	18	20	20
Drained Friction, ϕ' (°)	20 – 28	24.5 – 27	23.5 - 26.5
Drained Cohesion, c' (kPa)	0	0	0
SPT 'N' Value	13 - 51	32 - 91	13 - 75
Undrained Young's Modulus, E _u (MPa) ⁴⁾	15.6 - 61.2	38.4 - 109.2	15.6 - 90
Drained Young's Modulus E' (MPa) ⁵⁾	11.7 – 45.9	28.8 - 81.9	11.7 – 67.5
Drained Young's Modulus E' (MPa) ⁶⁾	-	160 – 455	65 – 375
Undrained Shear Strength, c _u (kPa) ⁷⁾	58 - 229	144 – 409	58 - 337
Plasticity Index (%)	13 - 55	16 – 24	17 - 29
Modified Plasticity Index (%)	7.28 – 45.1	16 - 24	17 - 29
Volume Change Potential [NHBC]	Low to High	Low to Medium	Low to Medium
Modulus of Volume Compressibility, $m_v (m^2/MN)^{8)}$	0.039 – 0.171	0.022 – 0.063	0.030 - 0.111

Table 10.3 Derived Geotechnical Parameters

¹⁾ Derived from Figures 1 and 2 of BS8004:2015

²⁾ Calculated from: $\varphi' = (42^{\circ} - 12.5\log_{10}I_p)$ for 5% $\leq I_p \leq 100\%$ Where, I_p is the soil's plasticity index (BS8004:2015). ³⁾ Calculated from Table 1 of BS8004:2015 (Granular Soils with less than 15% fines) OR Correlation between N value and Φ (see chart in Guides and Standards – Relation of N-values and Friction Angle by Peck et al)

⁴⁾ Calculated from: $E_u = 1.2$ N MPa, based on the guidance given in CIRIA Report 143.

⁵⁾ Calculated from E' = 0.9 N MPa, based on the guidance given in CIRIA Report 143 (COHESIVE SOILS)

⁶⁾ Calculated from E' = 5 N MPa, based on the guidance given in CIRIA Report 143 (CHALK)



Property*	Head Deposits	Zig Zag Chalk Formation	West Melbury Marly Chalk Formation	
⁷⁾ The undrained shear strength (c_u) of the cohesive soils was correlated to the SPT "N" values using Stroud (1974), where $c_u=f_1N$ and f_1 is factor related to the Plasticity Index (PI) of the clay (a value of f_1 equal to 5.0 for PI \leq 25% and a value of f_1 value equal to 4.5 for PI>25).				

⁸⁾ Calculated from: $m_v = 1/f_2 N m^2/MN$, f_2 is a coefficient proposed by Stroud and Butler (1975) and varies with Plasticity Index (PI) as presented in Figure 27 of CIRIA Report 27 or $10/c_u$.



11 GEOTECHNICAL ENGINEERING RECOMMENDATIONS

11.1 General

- 11.1.1 Subsequent to intrusive investigation of the site and receipt of the laboratory test results, the following geotechnical assessments have been made.
- 11.2 Proposed Foundations

<u>General</u>

- 11.2.1 Topsoil should be stripped from beneath proposed structures ahead of development.
- 11.2.2 Made Ground is not considered to provide suitable bearing strata due to its low and variable bearing properties, and the unacceptable risk of total and differential settlement.
- 11.2.3 All foundations should be deepened beneath these deposits and any soft/loose soils encountered in order to found within underlying competent strata.
- 11.2.4 Heave precautions will be required against the side of foundations and ground beams in accordance with the requirements set out in NHBC Standards Chapter 4.2. the Head deposits may be treated as being of high volume change potential and the chalk as being of medium volume change potential.

Conventional Foundations

- 11.2.5 Based on the ground and groundwater conditions encountered, conventional shallow foundations are likely to be suitable for the proposed development.
- 11.2.6 It is considered that traditional strip/trench-fill foundations up to 1m wide may be formed within the underlying deposits of Chalk at a minimum depth of 0.9m for an allowable bearing capacity of 110kPa. Alternatively, pad foundations with minimum dimensions of 1.2m x 1.2m could be formed, for an allowable bearing capacity of 160kPa. Total and differential settlements should be contained within tolerable limits.
- 11.2.7 Foundations must be deepened to found beneath Made Ground or where building near trees in accordance with NHBC guidance for soils of medium volume change potential (Chalk deposits).
- 11.2.8 Where foundations need to change levels as a result, the foundations should be stepped and reinforced. These steps should be no deeper than half of the width of the foundation and each step should not exceed 0.5m.
- 11.2.9 If foundations span different strata, e.g. sand and clay, they should either be deepened to terminate in a single soil stratum, or suitable reinforcement included (to be detailed by the structural engineer).
- 11.2.10 Foundations greater than 2.50m deep would require structure-specific design by a structural engineer.

11.2.11 Where any unexpected or soft ground conditions are encountered during the groundworks, works in that area should cease and the advice of a suitably qualified geotechnical engineer sought.

Piled Foundations

- 11.2.12 In the event that conventional foundations are not suitable, e.g. due to the required depth of construction, high structural loads, the presence of deeper zones of Made Ground or very soft and loose soils and/or where tree influence would dictate conventional foundations exceeding 2.5mbgl, an alternative such as piled foundations would be considered suitable.
- 11.2.13 Preliminary load capacities calculated for varying diameter of CFA piles taken into the Chalk are given in Table 11.1. The design should be used for preliminary purposes only as the actual working load is dependent on the type of pile and method of installation.

	Pile diameter (mm)				
Pile toe depth (mbgl)	450	600	800		
	Indicative Allowable Pile Capacity (kN)				
4	130	202	320		
6	224	341	529		
8	342	511	781		
9	410	609	922		

Table 11.1: Indicative Pile Capacities (kN)

- 11.2.14 To comply with BS EN 1997 and the guidance given by the Federation of Piling Specialists the ground must be proven to a minimum of 5m below the proposed toe of the piles. Consequently, values below 4mbgl are given indicatively in grey italics and a piling specialist should be consulted.
- 11.2.15 The construction of a piled foundation is a specialist job and the advice of a reputable local contractor familiar with the type of ground and groundwater conditions encountered on this site should be sought prior to finalising the design.
- 11.2.16 These working loads have been calculated on the basis of the ground and groundwater conditions encountered in the boreholes and assume the following:
 - The contribution to the working load on the upper 1.0m has been ignored due to the presence of Made Ground.
 - Partial factors were applied on the sum of the end bearing and skin friction working loads as defined by BS EN 1997 using Design Approach 1 Combination 2.
 - No allowance has been made for additional forces acting on the pile shaft, such as negative skin friction, or loading due to desiccation or heave forces.
 - Groundwater level was adopted as 8mbgl.
- 11.2.17 The preliminary working loads given are applicable to single vertically loaded piles. Where groups of piles are to be constructed, the working load of each individual pile should be reduced appropriately and a calculation made to check for the factor of safety against block failure.



- 11.2.18 A temporary working platform is likely to be required. In addition, some form of temporary drainage may also be required to prevent the working platform becoming waterlogged or deteriorating during use. A working platform should be designed in accordance with BRE BR470, or similar design standard.
- 11.2.19 The site overlies a Principal Aquifer and as such the foundation solution adopted should not introduce migration pathways for potential mobile contaminants from the overlying materials. The Environment Agency have a preference for Continuous Flight Auger (CFA) piles undertaken within geology designated as an aquifer as it reduces this risk. It is possible that the Environment Agency will require a Foundation Works Risk Assessment to be undertaken prior to any foundation works being undertaken. Liaison with the Environment Agency will be required in this respect.

Raft Foundations

- 11.2.20 Alternatively, a raft foundation may be a suitable option.
- 11.2.21 Such a foundation should be formed on a suitable thickness of well-engineered granular subbase, should provide an allowable bearing capacity of 100kN/m².
- 11.2.22 Prior to laying the suitable thickness of well-engineered granular sub-base, the formation level should be inspected by a suitably qualified and experienced specialist. Any loose or soft material should be removed to a suitable depth and replaced with well-graded, properly compacted granular fill or lean mix concrete. The formation should be blinded if left exposed for more than a few hours or if inclement weather is experienced.
- 11.2.23 In order to keep settlements within tolerable limits, the raft foundation should comprise a continuously well reinforced slab beneath the building.
- 11.2.24 In addition, reinforced concrete beams / thickening of the raft may be required beneath the structural walls or beneath lines of columns.
- 11.2.25 Any existing granular sub-base or granular Made Ground could potentially be lifted and reengineered.

11.3 Aggressive Ground Conditions

- 11.3.1 Sulphate attack on building foundations occurs where sulphate solutions react with the various products of hydration in Ordinary Portland Cement (OPC) or converted High-Alumina Cement (HAC). The reaction is expansive, and therefore disruptive, not only due to the formation of minute cracks, but also due to loss of cohesion in the matrix.
- 11.3.2 In accordance with BRE Special Digest 1, the characteristic values of sulphate used to determine the concrete classification are determined using the methodology summarised in Table 11.2 below.

No Samples in the dataset	Method for determining the sulphate characteristic value	
1 - 4	Highest value	
5 - 9	Mean of the top 2No highest results	



10 or greater

Mean of the top 20% highest results

11.3.3

Table 11.3 summarises the analysis of the aggressive nature of the ground for each of the strata encountered within the ground investigation.

Stratum	No Samples	pH range	Characteristic WS Sulphate (mg/l)	Characteristic Total Potential Sulphate (%) ¹⁾	Design Sulphate Class	ACEC Class
Made Ground/Topsoil	11	7.5 – 11.1	35.7	n/a	DS-1	AC-1
Head	16	7.0 - 8.8	39.3	n/a	DS-1	AC-1
Chalk	9	8.3 - 9.1	7.5	n/a	DS-1	AC-1

Table 11.3: Concrete in the Ground Class

1) Applies to soils containing more than 0.3% of Oxidisable Sulphides, calculated in accordance with BRE SD-1

- 11.3.4 Analysis of the results indicates that the underlying soils do not contain appreciable concentrations of Oxidisable Sulphates and therefore the Design Class is dependent on the soluble sulphate content and pH only.
- 11.3.5The concrete structures, including foundations, will need to be designed in accordance with BS
EN 1992-1-1:2004+A1:2014. It is recommended that the advice of this publication be taken for
the design and specification of all sub-surface concrete.

11.4 Ground Floor Slabs

11.4.1 Given the presence of shrinkable soils, it is recommended that suspended floor slabs are used with an adequate void designed according to NHBC Standards. As a guide, initial modelling indicates a requirement for a sub-floor void of at least 300mm due to the presence of shrinkable soils of high volume change potential (Head deposits).

11.5 Excavations

- 11.5.1 Temporary excavations within the Made Ground and granular soils are unlikely to remain stable and some form of temporary support or battering back to a safe angle is likely to be required.
- 11.5.2 Temporary excavations within the cohesive soils are likely to remain relatively stable in the short term though some spalling may be anticipated.
- 11.5.3 Ground works should always be designed in such a manner to avoid entry into excavations by construction or maintenance personnel. However, in the event that such works cannot be avoided or designed out, they should only be undertaken in accordance with a safe system of work, following an appropriate risk assessment and in accordance with any legislative requirements, e.g. Confined Spaces Regulations.

11.6 Road Pavements

11.6.1 Table 11.4 summarises the results of the in-situ CBR testing.

SECTION 11 GEOTECHNICAL ENGINEERING RECOMMENDATIONS



Position	Depth Range (mm)	Average DCP CBR (%)
	200 – 300	47.7
CBR1	300 – 500	11.6
	500 – 950	5.0
	50 - 300	11.4
CDD3	300 – 650	28.5
CBRZ	650 – 850	83
	850 – 900	275
	50 - 300	12.4
CBDD	300 - 600	18.7
СВКЗ	600 – 750	42.3
	750 – 950	34.2
	50 – 150	18.2
CBD4	150 – 400	11.4
СВК4	450 – 750	36.9
	800 – 900	31.5
	50 – 250	11.6
CRDE	250 - 400	19.1
CBK5	400 - 600	22.2
	600 – 950	50.8
CBDC	50 – 200	6.9
СВКБ	200 – 950	18.1
	50 - 400	10.3
CBDZ	400 – 750	30
CBK/	750 – 900	43.7
	400 – 900	34.9
	100 - 350	11.4
CDDQ	350 – 450	20.9
CDK8	450 – 850	9.0
	850 – 1000	19.1
	50 – 200	13.8
CBR9	200 - 400	31.5
	400 – 450	275
CBR10	100 – 250	19.1

Table 11.4: Summary of CBR Test Results



Position	Depth Range (mm)	Average DCP CBR (%)
	250 – 450	36.9
	450 – 950	27.8
	50 – 150	10.3
00044	150 – 300	29.7
CBRII	300 – 350	69.4
	350 – 400	275
	50 – 150	5.1
00010	150 – 400	15.6
CBR12	450 – 700	11.3
	700 – 950	19.8

- 11.6.2 The engineering characteristics of Made Ground are variable and the results of in-situ testing do not predict the overall settlements that may occur. It would therefore be prudent to assume a CBR value of 2.5% for the preliminary design of pavements constructed upon Made Ground.
- 11.6.3 In-situ CBR testing using a TRL DCP gives only a short-term estimated value, which may be influenced by seasonal variations in the moisture content of the soil or due to resistance against local granular inclusions.
- 11.6.4 Based on the test results, and with reference to the equilibrium suction-index CBR values provided in the Transport Road Research Laboratory (TRRL) Laboratory Report 1132 (1984), a preliminary CBR value of 3% and 5% are recommended for pavements constructed within the Head deposits and Chalk, respectively.
- 11.6.5 The near-surface soils are deemed to be of low permeability and should therefore be treated as being not frost susceptible.
- 11.6.6 Additional CBR testing should be undertaken after detailed design is complete to confirm suitability.

11.7 Surface Water Drainage

BRE 365 Soakage Tests

11.7.1 Table 11.5 summarises the soakage rates, which were calculated based on the results of the soakage testing:



Decition	Gaalagy	Calcula	ted Infiltration Rate	s (m/s)
Position	Geology	1 st cycle	2 nd Cycle	3 rd Cycle
TP4	Zig Zag Chalk Formation	N/D	N/D	*
TP6	West Melbury Marly Chalk Formation	7.6 x 10 ⁻⁶	1.2 x 10 ⁻⁵	*
TP11	West Melbury Marly Chalk Formation	N/D	*	*
TP13	Head and West Melbury Marly Chalk Formation	5.7 x 10 ⁻⁶	6.8 x 10 ⁻⁵	*
TP16	Zig Zag Chalk Formation	N/D	*	*

Table 11.5: Summary of BRE 365 Soakage Test Results

N/D: Not determined due to insufficient fall in head over a minimum two-day period *No time to attempt 2nd/3rd cycle

- 11.7.2 Based on the above results and ground conditions encountered, conventional soakaways may be suitable but results but infiltration rates have been found to be variable across the site.
- 11.7.3 Therefore it is recommended that further testing be undertaken at specific locations and depths where soakaways are intended to be installed.
- 11.7.4 A drainage engineer should be consulted for design in accordance with the recommendations provided in BRE DG 365 (2016): Soakaway design.

11.8 Groundwater Control

- 11.8.1 Groundwater was not encountered during drilling or subsequent monitoring (to a depth of 8m).
- 11.8.2 Subject to seasonal variations, any groundwater encountered during site works could be readily dealt with by conventional pumping from a sump used to collate waters.
- 11.8.3 Surface water or rainfall ingress may freely drain through the chalk, but if this does not occur, then they too could be dealt with by traditional sump and pump.

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APPENDICES



APPENDIX 1 – FIGURES



Geotechnical Engineering & Environmental Services across the UK

PROJECT NAME	Zone 5 & ESA Harwell Campus, Didcot, OX11 0FD	CLIENT	Harwell Campus GP Ltd
TITLE	Site Location Plan	PROJECT NO.	P4397J2609
DATE	25/07/2022	FIGURE NO.	1
	WORKS BOUNDARY		SITE PLAN SCALE: N.T.S.

JUMAS ENGINEERING ENVIRONMENTAL

WE LISTEN, WE PLAN, WE DELIVER

Geotechnical Engineering & Environmental Services across the UK

PROJECT NAME	Zone 5 & ESA Harwell Campus, Didcot, OX11 0FD	CLIENT	Harwell Campus GP Ltd
TITLE	Completed GI Plan	PROJECT NO.	P4397J2609
DATE	August 2022	FIGURE NO.	2





Practice Project No. Originator Volume Level Type Role Number 20157-SBR-ZZ-00-DR-A-00110

Drawing Title
SITE CONSTRAINTS & ANALYSIS PLAN

Suitability Code Status

^{scale} 1 : 500 @A0

Job Title RESILIENCE PROJECT

Client's Name HARWELL

Revision Description

77 Endell Street London WC2H 9DZ T +44 (0)20 7240 7766 W scottbrownrigg.com

SCOTT⁺ BROWNRIGG

Date

Drawn Checked

Rev

Scale Bar

©Scott Brownrigg Ltd This drawing is to be read in conjunction with all relevant architect's and other designers' drawings and associated specifications. Figured dimensions only are to be taken from this drawing. All dimensions are to be checked on site before any work is put in hand.

APPENDIX 2 – EXPLORATORY HOLE RECORDS

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Loggod Pv:			IAD	well Ca	impus	GP LIG						Data Co	mmoncod:			118.35	
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Type and diame	ter of equipm	nent:			000							Sheet No	n.			2 Of 2	
Water levels r	ecorded dur	ing b	oring	m	.00							Sheet N	0.			2012	
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						1: 084	13 289	2187	⊧: info@j	umasassociates	s.com W: ww	w.jomasasso	ciates.com				

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Checked By:			SC									Date Co	ompleted:		09/09/2022		
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3: Easting: 448	262.368	Nor	rthina:	1865	46.291												
4: *Field descri	ption **	Consist	tency e	estimat	ed usir	ng sem	i-empi	rical co	orrelations	with SPT N-V	alues, Plastic	ity Indices ar	nd published literature				
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									1.50 —				MELBURY MARLY CHAL	K FORMATION)			
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			Jampin	ny cod	e. u- l Jon	nas Ass	ociate	ы - са s Ltd -	Lakeside I	louse, 1 Fur:	an Disturbed zeground Way	, Stocklev P	ark, UB11 1BD	ample			
						T: 084	3 289	2187	E: info@jo	masassociate	es.com W: ww	w.jomasasso	ociates.com				

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						•]	í E					Explor	ratory Hole No:			BH3	
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Client:			Har	well Ca	mpus (GP Lta						Groun				117.54	
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4: *Field descri	ntion **	Consis	tency e	stimat	ed usin	na semi	-emnii	rical co	rrelations	with SPT N-va	alues Plastici	ty Indices	and nublished lite	rature			
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					Jom	nas Ass	ociates	s Ltd -	Lakeside I	House, 1 Furze	eground Way	, Stockley	Park, UB11 1BD				
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<form><form> ingenting index index Concrustion Production Production Production The data the concrustion of the concrustion</form></form>	Client:			Har	well Ca	mpus	GP Ltd						Ground	Level:			118.59		
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(mb) 10 1	Typo	Strata Type Depth (mbgl) Essuit Result Result Legend Depth (mbgl) Water Strikes (mbgl) Strata Description In Type 75 75 75 75 75 75 75 N 0.00 Image: Strata Description Image: Strat															Instal	lation	
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Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com	SPT	5.00	20	5 4 E m m	17 in D5	18	15		50	5.00 —	<u> </u>							1	a
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T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com			5	Samplir	ng Code	e: U- L	Jndistu nas Ass	rbed	B - Lar s I tol -	ge Disturb	ed D - Sma	all Disturbed	W - Water	(U*) Non recovery of ark. UB11 1BD	Sample				
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				-	J	9]	<i>E</i> F	13				Explora	tory Hole No:			BH4	
				-													
Site Address:			Zon	e 5 ano	d ESA	Harwell	Camp	us, Dic	dcot, OX11	OFD		Project	No:			P4397J2609	
Client:			Har	well Ca	mpus	GP Ltd						Ground	Level:			118.59	
Logged By:			JAR									Date Co	ommenced:			09/09/2022	
Checked By:			SC									Date Co	ompleted:			09/09/2022	
Type and diame	ter of equipm	nent:	DAN	IDO 20	00							Sheet N	10:			2 Of 2	
Water levels re	ecorded dur	ing bo	ring, i	m			1							1		1	
Date:																	
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Romarks	20111115.																
1: NO Water St	rike Recorder	4															
2: Chiselling for	50minutes v	with no	progre	ession													
3: Fasting: 448	160.866	Nort	thina:	1865	75.177												
4: *Field descri	ption **	Consiste	encv e	stimat	ed usir	na semi	i-empir	rical co	rrelations v	/ith SPT N-v	alues. Plastici	itv Indices a	nd published lite	rature			
		Sample	e or Te	ests		.9					Strata	.,	1				
												Water	-				
Туре	Depth (mbal)				Result	1				Legend	Depth (mbgl)	Strikes		Strata D	escription		Installation
	(mbgi)	75	75	75	75	75	75	N			(mbgi)	(mbgl)					
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	For 30mm R	2 ,For 4	45mm	in R5					-								
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					Jon	as Ass	ociates	5 Ltd -	Lakeside H	ouse, 1 Furz	eground Way	, Stockley P	ark, UB11 1BD				
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Site Address			700	E on		Llonwol	Comr		haat OV1			Droject	No		0420712600		
Site Address:			Lon	well Ca		GP Ltd	Camp	ous, Dio	acot, UX I	IUFD		Groupd		-	116 05		
Logged By:			IAR		inpus	GF Llu						Date Co	immenced:		09/09/2022		
Checked By:			SC	•								Date Co	mpleted:		09/09/2022		
Type and diame	ter of equipr	oont:			00							Sheet N			1 Of 2		
Water levels r		ing br	ring	m	.00							Sheet N			1012		
Date:	ecolueu uul	ing bu	Ji Irig,				1										
Hele donth:																	
Cocing dopth:																	
Casing deptil.	atullea.																
Level water offs	strike.																
Water Lever arte	er zumins:																
Remarks																	
1: NO Water St	rike Recorde	d															
2: Chiselling for	40minutes		progr	ession	04 757	,											
3: Easting: 448	No Water Strike Recorded Image: Strike Recorded ON/Water Strike Recorded Chiseling for 40minutes with no progression Easting: 44825.521 Northing: 186601.757 Sample or Tests Strata Type Depth (mbgl) Tests Strata Type Brown sandy gravel with occasional rootlets. Sand is fine to coarse. Gravel consists of medium to coarse, sub-rounded to sub-angular flint. (TOPSOIL) ES 0.30 Image: Sine to coarse. Gravel consists of fine to coarse. Sub-rounded to sub-angular flint. (TOPSOIL) ES 0.60 Image: Sine to coarse. Gravel consists of fine to coarse. Gravel cons																
4: *Field descri	Spread Spread<																
	e and similaritie of equipment: DANDO 2000 Instruction of equipment: DANDO 2000 e: e:																
	Depth	SC Under Complete: Option/2022 Option/2022 <t< td=""><td>lation</td></t<>															lation
Туре	(mbgl)					-				Legend	(mbgl)	(mbal)					
		75	75	75	75	75	75	N				(mogi)					
									0.00 —				Brown sandy gravel with	occasional root	lets. Sand	1	72-2-
									-				is fine to coarse. Gravel	consists of med	ium to	는근	E-2-
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ES	0.30								-	-1-1-1-1-1	0.20		Firm* brown sandy gray	elly CLAY Sand	is fine to	+=-=	1-1-1
									-	FI-I-I-I-I			coarse. Gravel consists c	of fine to coarse		FIFI	F==
									0.50 —	F			sub-rounded to sub-ange	ular flint and oc	casional	FIFI	
ES	0.60												chalk (HEAD)			FIFI	
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D	1.00								1.00 —		1		with occasional orange s	taining (WEST N	AFI BURY		<u></u>
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Site Address:			Zone	e 5 and	I ESA I	Harwell	Camp	us, Dic	icot, OX11	0FD		Project I	No:			P4397J2609	
Client:			Harw	vell Ca	mpus	GP Ltd						Ground	Level:			116.95	
Logged By:			JAR									Date Co	mmenced:			09/09/2022	
Checked By:			SC									Date Co	mpleted:			09/09/2022	
Type and diame	ter of equipn	nent:	DANI	DO 20	00							Sheet N	0:			2 Of 2	
Water levels re	ecorded dui	ring bor	ing, n	n			T						I				
Hole denth:							-										
Casing depth:										-		-					
Level water on s	strike:																
Water Level after	er 20mins:																
Remarks																	
1: NO Water St	rike Recorde	d															
2: Chiselling for	40minutes	with no p	progre	ssion													
3: Easting: 448	285.521	Norti	hing:	18660	01.757	a somi	omni	ical co	rrolations	with SPT N ve	aluos Plastici	ty Indicos ar	ad published liter	aturo			
4. Field descri		Sample	or Te	sts	eu usii	ig semi	-empi	ICAI CO	relations	WILLI SPT IN-Va	Strata	ty mulces al		ature			
	Denth		01 10	.515	Deeuli						Danth	Water	-	Strata D			Installation
Туре	(mbgl)	75	75	75	75	75	75	N		Legend	(mbgl)	Strikes (mbgl)		Strata De	escription		Installation
D	5.00								5.00 —				CHALK recover	ed as very	stiff** greyish	white CLAY	******
										┍╴┍╴┍╴┍╹			With occasional	orange sta	aining (WEST N	MELBURY	
													MANEL CHALK		•/		
SPT D	5.45 5.50	15	10	50				50	5.50 —	╵┲┍┺┺┺┪ ┺┺┺┺┺							
	For 36mm F	2. For 2	0mm I	R3						┶┲ ┍┲┍┍┍┍┍ ┍┶┲┶┲┍							
SPT	5.70	25		50				50	-		5.70						
	For 55mm in	n R1. Foi	r 37mr	m in R	3				_								
									_								
									6.00 —								
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									6 50 -								
									0.00								
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									9.50								
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									10.00-								
		Sa	mpling	g Code	e: U- L	Indistur	bed	B - Lar	ge Disturb	ed D - Sma	II Disturbed	W - Water	(U*) Non recov	very of San	nple		
					Jon	has Ass	ociates	s Ltd -	Lakeside H	louse, 1 Furze	eground Way	, Stockley Pa	ark, UB11 1BD				
						i. U84	J 289	∠10/E	@Jor	nasassuciates	SCOTT W: WW	w.jumasasso	vulles.com				

					E			= =	=				CABLE PERCUSSI	ON BOREHOLE	E RECORD		
				-	J	9]	¥ Fa					Explora	tory Hole No:		BH6		
Site Address:			Zon	e 5 and	d ESA	Harwel	I Camp	ous, Dio	dcot, OX11	0FD		Project	No:		P4397J2609		
Client:			Har	well Ca	impus	GP Ltd						Ground	Level:		118.71		
Logged By:			JAR									Date Co	mmenced:		10/09/2022		
Checked By:			SC									Date Co	mpleted:		10/09/2022		
Type and diame	eter of equipm	nent:	DAN	1DO 20	000							Sheet N	0:		1 Of 1		
Date:	ecolueu uul	ing be	, ing,														
Hole depth:																	
Casing depth:																	
Level water on s	strike:																
Water Level after	er 20mins:																
1: NO Water St	rike Pecorde	d															
2: Chiselling for	r 30minutes v	with no	progr	ession													
3: Easting: 448	3174.14	Nortl	hing:	18663	1.657												
4: *Field descri	ption **	Consist	ency e	estimat	ed usir	ng sem	i-empii	rical co	rrelations	with SPT N-va	alues, Plastici	ty Indices ar	nd published literature				
		Sample I	e or Te	ests					-		Strata	Matan	_				
Type	Depth				Result	t				Legend	Depth	Strikes	Strata I	Description		Instal	lation
Type	(mbgl)	75	75	75	75	75	75	N	1	Legena	(mbgl)	(mbgl)					
									0.00 —	~~~~~			Brown sandy gravel with	occasional root	tlets, Sand	[
													is fine to coarse. Gravel	consists of med	ium to		
									-	*******			coarse, sub-rounded to a occasional concrete. (MA	sub-angular flint (DE GROUND)	t and	크림	
											0.40			,		FI	
									0.50 -				CHALK recovered as stif	to very stiff**	greyish	EE	
										╵ <u>┍╹┍╹┍╹</u> ┎┸╖┸╖┸╖┸			FORMATION)	SORT MARET OF		크리	
										┍┷┲┷┲┷┲┙						FI	
																EEE	
									-	┍ <u>┍┍┍┍┍</u> ┍┍ ┓┍╖┍╖┍╖┍╖							
									1.00 —	┍┷╓┷╓┷╓┷ ┲┷┲┷┲┷┲							
SPT	1.20	5	6	7	8	7	8	30									
511	1.20		0	,			0			┍┍┍┍┍┍┍┍ ┍┍┍┍┍┍┍┍┍							
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									1.50 —								
									-	┍ <u>┍┍┍┍┍</u> ┍ ┓┍╖┍╖┍╖┍							
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SPT	2.00	8	8	10	8	10	10	38	2.00 —								
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									2.50 —								
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SPT	3.00	10	11	10	10	11	11	42	3.00 —								
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									3.50 —	<mark>┲┍╖┍╖┍╖┍</mark>							
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CDT	4.00	10	10	12	12	12	10	40	4 00 -								
371	4.00	10	12	12	12	13	12	49	4.00 -								
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									-								
									4.50 -	┍ <u>┍┍┍┍┍</u> ┍┍ ┓┍╖┍╖┍╖┍╖							
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									_								
SPT	5.00	15	10	15	18	17		50	5.00 —		5.00						g · · · ·
	For 50mm R	5.															
SPT	For 25mm P	25 2. For	amplir		e: U- l	Jndistu	rbed	50 <mark>B - Lar</mark>	ge Disturb	ed D - Sma	II Disturbed	W - Water	(U*) Non recovery of Sa	mple			
	L. Lonin N	_, . 01			Jon	nas Ass T: 084	ociate: 3 289	s Ltd - 2187 E	Lakeside I E: info@jo	louse, 1 Furze nasassociates	eground Way s.com W: ww	, Stockley Pa w.jomasasso	ark, UB11 1BD ociates.com				

								= =	7				CABLE PEI	RCUSSIC	N BOREHOLE	E RECORD		
				-	J	•]	¥ Fa	13				Explora	atory Hole No:			BH7		
Site Address:			Zon	e 5 and	d ESA I	Harwell	Camp	us, Dio	icot, OX11	OFD		Project	No:			P4397J2609		
Client:			Harv	well Ca	mpus	GP Ltd						Ground	d Level:			117.52		
Logged By:			JAR									Date C	ommenced:			10/09/2022		
Checked By:			SC									Date C	ompleted:			10/09/2022		
Type and diame	eter of equipn	nent:	DAN	1DO 20	000							Sheet	No:			1 Of 1		
Date:		ing bu	inng,	111			1											
Hole depth:																		
Casing depth:																		
Level water on s	strike:																	
Water Level after	er 20mins:																	
1: NO Water St	rike Recorde	d																_
2: Chiselling for	r 30minutes	with no	progr	ession														
3: Easting: 448	3256.041	Nor	thing:	18666	65.294													
4: *Field descri	ption **	Consist	ency e	estimat	ed usir	ng semi	i-empii	rical co	rrelations	with SPT N-v	alues, Plastic	ity Indices a	and published literat	ture			-	
	:	Sampie	e or Te	ests							Strata	Water	-					
Туре	Depth (mbgl)				Result	İ				Legend	Depth (mbgl)	Strikes		Strata De	escription		Instal	lation
51	(ingi)	75	75	75	75	75	75	N		Ŭ	(ngu)	(mbgl)						
									0.00 —				Brown sandy gra	avel with o	occasional root	tlets. Sand		
									_				is fine to coarse.	Gravel co	onsists of med	ium to t (TOPSOIL)	F====	
											0.35				is angular min		E=33	E-E-
									_		0.00		CHALK recovered	d as very	stiff** greyish	white CLAY	물림	
									0.50 —				(WEST MELBUR	Y MARLY (CHALK FORMA	TION)	E====	83
									_								扫扫	EE:
									_								E=33	EE
									_	┍ <mark>┍┍┍┍┍┍</mark> ┍┍								
									1.00 —	┍┷┲┷┲┷┲┷ ┲┷┲┷┲┷┲							1	<u></u>
									-									
SPT	1.20	10	8	8	7	8	8	31	_	╵┲┸┲┸┲┸┲ ┎┸┲┸┲┸┲								1:::
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SPI	2.00	8	/	8	′	10	10	35	2.00 —									
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SPT	3.00	10	8	11	10	11	12	44	3.00 —									
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									3.50 —	┍╩┲╩┲╩┲╩ ┲╩┲╩┲╩┲╩								Į
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SPT	4.00	10	13	12	13	13	12	50	4.00 —									1 · · ·
	For 40mm in	R6							_	┍╨┍╨┍╨┏╨ ┍╨┍╨┍╨┏╹								
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									-		5.00							1
SPT	5.00	20	5	18	20			38	5.00 —	<u>, , , , , , , , , , , , , , , , , , , </u>	0.00						1	<u> </u>
581	For 50mm i	25 1 R1 Fc	or 75m		23			50										
		S	amplin	ng Cod	e: U- L	Indistu	rbed	B - Lar	ge Disturb	ed D - Sma	II Disturbed	W - Water	(U*) Non recove	ery of Sam	nple			
					JOU	T: 084	3 289	2187 E	: info@jo	nasassociates	s.com W: ww	w.jomasass	ociates.com					

								TRI AL F	PITRECORD		
				10H	A5						
									Exploratory Ho	DIE NO:	P1
Site Address:			Zone 5 and	ESA Harwell Car	mpus, Didcot , O	X11 0FD			Project No:		P4397J2609
Client:			Harwell Car	npus GP Ltd					Ground Level:		118.41
Logged By:			JAR						Date Commen	ced:	13/09/2022
Checked By:			SC						Date Complete	ed:	13/09/2022
Pit Dimension:	eter of equipme	ent:	JCB 3CX	3 10		Wid	th	1.00	Sheet No:	Denth:	1.60
Remarks			Longtin	0.10		, ind		1.00		Doptili	1.00
1: * - Field Ob	servation										
2: No groundw	ater reported										
4:	3212.573	NOTIN	ing: 18645	0.126							
		Samp	le or Tests					Strata			
Туре	Depth (mbgl)			Result			Legend	Depth (mbgl)	Water Strikes		Strata Description
						0.00 —			(11.291)		
						- 0.00		0.10		Asphalt (MADE GR	
						_		0.20		Concrete (MADE G	ROUND)
						_		0.30		Brown sandy grave	lly clay. Sand is fine to coarse. Gravel
ES	0.40					0.50		0.50		consists of fine to c and occasional chal	coarse, sub-angular to sub-rounded flint lk. (HFAD)
						0.50 -		0.00		CHALK recovered a	is stiff* greyish white CLAY. (ZIG ZAG
						_	╘┲╩┲╩┲╩┲ ┏┸┲┸┲			CHALK FORMATION	1)
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						4.50 —					
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						5.00 —					
		Sar	mpling Code	: U- Undisturbed	B - Large Dist	urbed E) - Small Distu	irbed W	- Water (U*)	Non recovery of San	nple
				T: 0843 28	39 2187 E: info@	jomasas	sociates.com \	u way, st V: www.jo	omasassociates.	com	

			,				TRI AL F	PITRECORD
		(JOMAS	,			Exploratory Ho	le No:	TP2
Site Address:		Zone 5 and ESA Harwell Campus, Dide	cot, OX11 OFD			Project No:		P4397J2609
Client:		Harwell Campus GP Ltd				Ground Level:		117.23
Logged By:		JAR				Date Comment	ced:	13/09/2022
Checked By:		SC				Date Complete	d:	13/09/2022
Type and diame	eter of equipm	ent: JCB 3CX	Mid	th.	1.00	Sheet No:	Dopth	1 Uf 1
Remarks		Length. 2.50	Wid		1.00		Deptil.	3.20
1: * - Field Obs	servation							
2: No groundwa	ater reported							
3: Easting: 448	3282.126	Northing: 186409.345						
4:		Sample or Tests			Strata			
						Water	-	
Туре	Depth (mbgl)	Result		Legend	Depth (mbgl)	Strikes		Strata Description
			0.00			(indi)		
			0.00 —		0.10		Asphalt (MADE GRO	DUND)
							Concrete (MADE GF	ROUND)
					0.30		Brown and black sa	ndy gravelly CLAY. Sand is fine to
							coarse. Gravel cons	sists of fine to coarse sub-angular to
ES	0.50		0.50 —		0.60		(MADE GROUND)	
			_				CHALK recovered a	s stiff* greyish white stained orange
				╒┷ <u>╓┍┶╙┍</u> ┍ ┕┲┶┶┖┷				
			1.00 —	┍ ╩┍╩┍╩┍╩┍╩ ┍┲┲┲┲┲┲				
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			-					
D	1.50		1.50 —	┍┷┲┷┲┷┲┷ ┲┷┲┷┲┷┲				
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			-					
			2.00 —	┍╨┲╨┲╨┲╨┥ ┍╨┲╨┲╨┲╢				
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			-	╘╖┵╖┵╖┵╓╴ ┎╴┍╴┍╴┍				
			2.50 —	┍╨┍╜┍╜┍╜ ┍╖┍╖┍╖┍╖				
			_	╵╷┍╷┍╷┍╷┍ ┍╴┍╴┍╴┍				
			3.00 —	┍╨┲╨┲╨┲╨ ┍╨┲╨┲╨┲╢				
					3.20			
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			3.50 —					
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			4.50 —					
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			5.00 -					
		Sampling Code: U. Undistante d. D. J	Disturber 1 - 7	Small Diri	wheed 1	Woter (114)	Non room of C	
		Jomas Associates Ltd - L T: 0843 289 2187 E:	akeside House, info@jomasass	1 Furzegroun 3 Sociates.com V	d Way, St V: www.jo	 vvater (U*) ockley Park, UB omasassociates. 	non recovery of San 11 1BD com	ipie

									TRIAL F	PIT RECORD
			(JOM	45				Exploratory Ho	le No:	TP3
Site Address:			Zone 5 and ESA Harwell Cam	pus, Didcot, OX11	0FD			Project No:		P4397J2609
Client:			Harwell Campus GP Ltd					Ground Level:		117.61
Logged By:			JAR					Date Commen	ced:	13/09/2022
Checked By:			SC					Date Complete	:d:	13/09/2022
Type and diame	eter of equipme	nt:	JCB 3CX					Sheet No:		1 Of 1
Pit Dimension:			Length: 3.00		Widt	:h:	1.00		Depth:	1.50
Remarks										
1: ^ - Fleid Ob	servation									
3: Easting: 448	3326.611	North	hina: 186410.419							
4:			5							
		Samp	ole or Tests				Strata			
Туре	Depth (mbgl)		Result			Legend	Depth (mbgl)	Water Strikes (mbgl)		Strata Description
				0.0	00 -		0.20		Concrete (MADE GF	ROUND)
					-	- <u>-</u>	0.30		Brown and black sa	ndy gravelly CLAY. Sand is fine to
ES	0.40			0.5	io —	·	0.50		coarse. Gravel cons sub-rounded flint, c	ists of fine to coarse sub-angular to halk and rare asphalt (MADE GROUND)
									CHALK recovered a CLAY. (ZIG ZAG CH	s stiff* greyish white stained orange IALK FORMATION)
				1.0	00 -					
D	1.20									
				1.5	io		1.50			
					_					
				2.0	- - 00 -					
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				3.5	00 -					
				4.0	- - - 00					
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				4.5	- io					
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				5.0						
		Sa	mpling Code: U- Undisturbed Jomas Associate T: 0843 289	B - Large Disturbe es Ltd - Lakeside Ho 2187 E: info@jom	ed D ouse, nasass	- Small Distu 1 Furzeground sociates.com V	rbed W I Way, St /: www.jo	- Water (U*) ockley Park, UB omasassociates.	Non recovery of San 11 1BD com	nple

								TRI AL F	PITRECORD		
				19. ji	TAS				Exploratory Ho	le No	TP4
									Exploratory ric		
Site Address:			Zone 5 and	ESA Harwell	Campus, Didcot ,	OX11 OFD			Project No:		P4397J2609
Client:			Harwell Car	npus GP Ltd					Ground Level:		118.09
Logged By:			JAR						Date Commen	ced:	13/09/2022
Type and diam	eter of equipme	ent:	JCB 3CX						Sheet No:		1 Of 1
Pit Dimension:			Length:	2.50		Wid	th:	1.00		Depth:	3.30
Remarks											
1: * - Field Ob	servation										
3: Easting: 44	8228.638	North	ina: 18653	6.328							
4: Soil infiltrat	ion testing unde	ertaken	within trial	pit							
	1	Samp	le or Tests			_		Strata		-	
Туре	Depth (mbgl)			Result		0.00	Legend	Depth (mbgl)	Water Strikes (mbgl)		Strata Description
						0.00	<u>-9-1-1</u>	0.20		Brown sandy grave to coarse. Gravel c sub-rounded to sub	I with occasional rootlets. Sand is fine onsists of medium to coarse, o-angular flint. (TOPSOIL)
ES	0.40					0.50 —		0.50		Brown sandy grave consists of fine to c and occasional cha	Ily CLAY. Sand is fine to coarse. Gravel coarse sub-rounded to sub-angular flint (HEAD)
						-				CHALK recovered a CHALK FORMATION	s stiff* greyish white CLAY. (ZIG ZAG I)
						1.00 —					
						-					
D	1.50										
						-					
						2.00					
						-					
						2.50 —					
						-					
						3.00 —					
						-		3.30			
						3.50 —					
						4.00					
						-					
						4.50 —					
						5.00 —					
	· · · · · ·	Sar	npling Code	: U- Undisturk Jomas Asso T: 0843	ed B - Large D ciates Ltd - Lake 289 2187 E: infe	isturbed E side House, o@jomasas) - Small Distu 1 Furzegroun sociates.com V	rbed W d Way, St V: www.jo	- Water (U*) cockley Park, UB omasassociates.	Non recovery of Sar 11 1BD com	nple

										TRI AL F	PITRECORD
				[0]	A5				Exploratory Ho	No:	TD5
										NC NO.	11.5
Site Address:			Zone 5 and E	SA Harwell Cam	pus, Didcot, O	X11 0FD			Project No:		P4397J2609
Client:			Harwell Cam	ous GP Ltd					Ground Level:		117.31
Logged By:			JAR						Date Commen	ced:	13/09/2022
Checked By:			SC						Date Complete	ed:	13/09/2022
Type and diame	eter of equipme	ent:	JCB 3CX			10/1-14	1.	1.00	Sheet No:	Dauth	1 Of 1
Pit Dimension:			Length:	2.30		vviat	:n:	1.00		Deptn:	3.00
1: * - Field Obs	servation										
2: No groundw	ater reported										
3: Easting: 448	3262.987	North	hing: 186580.	144							
4:											
		Samp	ole or Tests					Strata	1 Mator	4	
Туре	Depth (mbgl)			Result			Legend	Depth (mbgl)	Strikes (mbgl)		Strata Description
						0.00 —	<u>-ēē-</u>	0.20		Brown sandy grave to coarse. Gravel co sub-rounded to sub	I with occasional rootlets. Sand is fine onsists of medium to coarse, -angular flint. (TOPSOIL)
FS	0.40									Brown sandy grave	Ily CLAY. Sand is fine to coarse,
20	0.10					0.50 —		0.60		coarse sub-rounded	to sub-angular flint and occasional
						-		0.00		CHALK recovered a MELBURY MARLY C	s stiff* greyish white CLAY. (WEST HALK FORMATION)
						1 00 -					
D	1.20					-	· · · · · · · · · · · · · · · · · · ·				
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						3.00 —	<u>' </u>	3.00			
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						4.00 —					
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						4.50 —					
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						5.00					
						5.UU —					
		Sa	mpling Code:	U- Undisturbed Jomas Associate	B - Large Dist	urbed D le House,	- Small Distu 1 Furzegroun	irbed W d Way, St	/ - Water (U*) tockley Park, UB	Non recovery of San 11 1BD	nple
				1: 0843 289	7 Z I87 E: INTO@	Joinasass	ociates.com \	v: www.ji	unasassociates.	COTT	

				-				TRI AL F	PITRECORD
			<i>(JOMA</i>	3			Exploratory Ho	le No:	TP6
Site Address:			Zone 5 and ESA Harwell Campus,	Didcot, OX11 0FD			Project No:		P4397J2609
Client:			Harwell Campus GP Ltd				Ground Level:		116.72
Logged By:			JAR				Date Commen	ced:	14/09/2022
Checked By:	ton of couloms		SC ICP 2CV				Date Complete	:d:	14/09/2022
Pit Dimension:			Length: 2.50	Wig	dth:	1.00	Sheet NO.	Depth:	3.10
Remarks			5						
1: * - Field Obs	servation								
2: No groundw	ater reported	Northi	ing: 196502.667						
4: Soil infiltrati	on testing unde	ertaker	n within trial pit						
		Samp	ple or Tests			Strata			
Туре	Depth (mbgl)		Result		Legend	Depth (mbgl)	Water Strikes (mbgl)		Strata Description
ES	0.50					0.30		Brown sandy grave to coarse. Gravel o sub-rounded to sut Brown sandy grave sub-rounded to sut coarse sub-rounded chalk (HEAD) CHALK recovered a MELBURY MARLY C	I with occasional rootlets. Sand is fine onsists of medium to coarse, p-angular flint. (TOPSOIL) Ily CLAY. Sand is fine to coarse, p-angular. Gravel consists of fine to d to sub-angular flint and occasional s stiff* greyish white CLAY. (WEST HALK FORMATION)
				5.00					
		Sa	ampling Code: U- Undisturbed B - Jomas Associates Ltv T: 0843 289 218	Large Disturbed d - Lakeside House 7 E: info@jomasas	D - Small Distu , 1 Furzegroun sociates.com V	urbed W d Way, St N: www.jo	7 - Water (U*) cockley Park, UB omasassociates.	Non recovery of San 11 1BD com	nple

				_				TRI AL F	PIT RECORD
			IGMA	5			E	1. N.	707
			(Exploratory Ho	DIE NO:	
Site Address:			Zone 5 and ESA Harwell Campus.	Didcot . OX11 0FD			Project No:		P4397.J2609
Client:			Harwell Campus GP Ltd				Ground Level:		118.28
Logged By:			JAR				Date Commen	ced:	14/09/2022
Checked By:			SC				Date Complete	ed:	14/09/2022
Type and diame	eter of equipn	nent:	JCB 3CX				Sheet No:		1 Of 1
Pit Dimension:			Length: 3.20	Wid	th:	1.00		Depth:	1.60
Remarks									
2: No groundw	ater reported								
3: Easting: 448	3183.576	Nort	hing: 186603.517						
4:									
		Sam	ple or Tests			Strata		_	
	Depth					Depth	Water		Strata Description
Гуре	(mbgl)		Result		Legend	(mbgl)) (mbgl)		
				0.00 —					
								Brown sandy grave consists of medium	 I. Sand is fine to coarse. Gravel to coarse, sub-rounded to sub-angular
						0.20		flint. (TOPSOIL)	
				-				sub-rounded to sub	angular. Gravel consists of fine to
					<u> </u>			coarse sub-rounded	d to sub-angular flint and chalk (HEAD)
ES	0.50			0.50 —		0.60			
								CHALK recovered a	s greyish white GRAVEL. (WEST
				_	┍╴┍╶┍╶┍╶┍ ╻╴╴			INIELBURT MARLT C	HALK FORMATION)
					┝┲┶┲┶┲┷┲┙ ┲┷┲┷┲┷┲┷				
				1.00 —					
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D	1.20			-	<mark>┢┸╓┸╓┸╓┸</mark>				
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				1.50 -					
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				4.00 —					
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				4.50 -					
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				5.00 -	1				
		Sa	ampling Code: U- Undisturbed B - L	arge Disturbed	0 - Small Distu	urbed W	/-Water (U*)	Non recovery of San	nple
			Jomas Associates Ltd	I - Lakeside House,	1 Furzegroun	d Way, St	tockley Park, UB	11 1BD	
			1. 0043 207 218	, ല. നന്യാന്നമാമട		•. ••••••.J	ornasassociates.		

										TRI AL F	PITRECORD
			-	JOR	AS				Exploratory Ho	ole No:	TP8
Site Address:			Zone 5 and	ESA Harwell Ca	ampus, Didcot ,	OX11 OFD			Project No:		P4397J2609
Client:			Harwell Can	npus GP Ltd					Ground Level:		117.69
Logged By:			JAR						Date Commen	ced:	14/09/2022
Checked By:			SC						Date Complete	ed:	14/09/2022
Type and diame	eter of equipm	ent:	JCB 3CX	0.50		10/1-1	141-	1.00	Sheet No:	Dauth	1 Of 1
Pit Dimension: Remarks			Length:	2.50		vvid	ith:	1.00		Deptn:	3.20
1: * - Field Obs	servation										
2: No groundw	ater reported										
3: Easting: 448	3214.239	Nort	hing: 186614	4.004							
4:											
		Sam	ole or Tests			-		Strata	Mator	-	
Туре	Depth (mbgl)			Result		0.00	Legend	Depth (mbgl)) (mbgl)		Strata Description
						- 0.00		0.30		Brown sandy grave consists of medium flint. (TOPSOIL)	I. Sand is fine to coarse. Gravel to coarse, sub-rounded to sub-angular
FS	0.50					- 0.50	- <u>0</u> 00			Brown sandy grave sub-rounded to sub coarse sub-rounded	Ily CLAY. Sand is fine to coarse, o-angular. Gravel consists of fine to d to sub-angular flint and chalk (HEAD)
	0.00					-		0.60		CHALK recovered a orange staining (W	IS greyish white GRAVEL with rare
						-				FORMATION)	
						1.00 —					
D	1.20					-					
						1.50 —					
						-					
						-	┍╖┍╖┍╖┍╖ ┍╖┍╖┍╖┍╖				
						2.00 -					
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D	2.40					2 50 -					
						-					
						-					
						3.00 —					
						-		3.20			
							-				
						3.50 -					
						-					
						4.00 -					
						-	-				
						4.50 —					
						-					
						5.00 -					
	·	Sa	mpling Code:	: U- Undisturbe Jomas Associ T: 0843 2	ed B - Large Dis iates Ltd - Lakes 289 2187 E: info	turbed [ide House, @jomasas	D - Small Distu 1 Furzegroun sociates.com V	rbed W d Way, St V: www.jo	/ - Water (U*) tockley Park, UB omasassociates.	Non recovery of San 11 1BD com	nple

								TRI AL F	PIT RECORD
		-	JOH	15			Exploratory Ho	le No:	TP9
Site Address:		Zone 5 and	ESA Harwell Cam	ous, Didcot, OX11 0FD			Project No:		P4397J2609
Client:		Harwell Car	npus GP Ltd				Ground Level:		116.89
Logged By:		JAR					Date Comment	ced:	14/09/2022
Checked By:		SC					Date Complete	d:	14/09/2022
Type and diame	eter of equipme	ent: JCB 3CX	2.50	Mid	th	1.00	Sheet No:	Dopth:	1 Uf 1
Remarks		Length.	2.50	Wid		1.00		Deptil.	2.70
1: * - Field Obs	servation								
2: No groundwa	ater reported								
3: Easting: 448	3307.762	Northing: 18662	9.032						
4:		Sample or Tests				Strata			
Туре	Depth (mbgl)		Result		Legend	Depth (mbgl)	Water Strikes (mbgl)	-	Strata Description
				0.00 —		0.30		Brown sandy grave consists of medium flint. (TOPSOIL)	I. Sand is fine to coarse. Gravel to coarse, sub-rounded to sub-angular
ES	0.50			0.50 —		0.00		Brown sandy grave sub-rounded to sub coarse sub-rounded	lly CLAY. Sand is fine to coarse, -angular. Gravel consists of fine to I to sub-angular flint and chalk (HEAD)
				-	 	0.70		CHALK recovered a orange staining (W	s stiff* greyish white GRAVEL with rare EST MELBURY MARLY CHALK
				1.00 —				FORMATION)	
U	1.20								
				1.50 —					
				2.00 —					
				-					
U	2.40			2.50 —					
				3.00		2.90			
				-					
				3.50 —					
				-					
				4.00 —					
				4.50 —					
				5.00 —					
		Sampling Code	: U- Undisturbed Jomas Associate T: 0843 289	B - Large Disturbed E s Ltd - Lakeside House, 2187 E: info@jomasass) - Small Distu 1 Furzegroun sociates.com V	rbed W d Way, St V: www.jo	' - Water (U*) ockley Park, UB omasassociates.	Non recovery of San 11 1BD com	nple

				-				TRI AL F	PIT RECORD
							Exploratory Ho	le No:	TP10
			`						
Site Address:			Zone 5 and ESA Harwell Campus, Dic	dcot, OX11 0FD			Project No:		P4397J2609
Client:			Harwell Campus GP Ltd				Ground Level:		119.13
Logged By:			JAR				Date Commen	ced:	14/09/2022
Checked By:			SC				Date Complete	ed:	14/09/2022
Type and diame	eter of equipm	nent:	JCB 3CX	14/2-1	*1-	1.00	Sheet No:	Danth	1 Of 1
Pit Dimension:			Length: 3.30	vvid	un:	1.00		Depth:	1.50
1. * - Field Obs	servation								
2: No groundw	ater reported								
3: Easting: 448	3125.149	Nort	hing: 186645.466						
4:			- °						
		Sam	ple or Tests			Strata			
	Depth					Depth	Water		Strata Description
Туре	(mbgl)		Result		Legend	(mbgl)	Strikes (mbal)		
							(mbgi)		
				0.00 —				Brown sandy grave	I. Sand is fine to coarse. Gravel
								flint. (TOPSOIL)	to coarse, sub-rounded to sub-angular
				_		0.40			
FS	0.50			0.50 -				Brown sandy grave	Ily CLAY. Sand is fine to coarse,
				_	===================			coarse sub-rounded	I to sub-angular flint and chalk (HEAD)
				_	=======				
				–	<u></u>	0.80		CHALK recovered a	s stiff* arouish white CLAV (MEST
								MELBURY MARLY CI	HALK FORMATION)
				1.00 —					
D	1.20								
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				-					
				5.00 —					
		¢.	ampling Code: U- Undisturbed - B - Lar	ae Disturbed) - Small Disti	rbed W	- Water (II*)	Non recovery of San	nple
		50	Jomas Associates Ltd -	Lakeside House,	1 Furzegroun	d Way, St	ockley Park, UB	11 1BD	10 - 1
			T: 0843 289 2187 E	: info@jomasass	sociates.com V	V: www.jo	omasassociates.	com	
I									

				3				TRI AL F	PIT RECORD
			<i>JOMA</i>				Exploratory Ho	le No:	TP11
Site Address:			Zone 5 and ESA Harwell Campus, D	idcot, OX11 0FD			Project No:		P4397J2609
Client:			Harwell Campus GP Ltd				Ground Level:		118.29
Checked By:			SC				Date Complete	d:	13/09/2022
Type and diame	eter of equipm	nent:	JCB 3CX				Sheet No:		1 Of 1
Pit Dimension:			Length: 2.50	Wid	th:	1.00		Depth:	3.50
Remarks									
1: * - Field Obs	servation								
2: No groundw	204 648	Nort	hing: 186665.052						
4: Soil infiltrati	on testing und	dertakei	n within trial pit						
		Sam	ple or Tests			Strata			
Туре	Depth (mbgl)		Result		Legend	Depth (mbgl)	Water Strikes (mbgl)		Strata Description
				0.00 —	*****			Brown sandy grave	l. Sand is fine to coarse. Gravel
				-		0.20		consists of medium	to coarse, sub-rounded to sub-angular
				_		0.20		Concrete (MADE G	ROUND)
				_					
				0.50 —		0.50		Prown sandy grave	Illy CLAV. Sand is find to coarso. Gravel
								consists of fine to c	coarse sub-rounded to sub-angular flint
					<u></u>			and chalk (HEAD)	
ES	0.80								
				1.00 -					
				-	<u> </u>				
D	1.20			-	<u>-</u>	1.20		CHALK recovered a	s stiff* arevish white CLAY with
				-				occasional orange	staining. (WEST MELBURY MARLY
				1 50				CHALK FORMATION	N)
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D	2.00			2.00 —					
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				2.50 —					
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				3.50 —	<u> </u>	3.50			
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				4.00 —					
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				4.50 —					
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				5.00 -					
		Sa	ampling Code: U- Undisturbed B - La	arge Disturbed) - Small Distu	rbed W	- Water (U*)	Non recovery of Sar	nple
			Jomas Associates Ltd T: 0843 289 2187	 Lakeside House, E: info@iomasas 	1 Furzeground	d Way, St /: www.i/	ockley Park, UB	11 1BD com	
				j = 1110000					

				-				TRI AL F	PIT RECORD
			<i>(JOMA</i>)	5			Exploratory Ho	ble No:	TP12
Site Address:			Zone 5 and ESA Harwell Campus,	Didcot, OX11 0FD			Project No:		P4397J2609
Client:			Harwell Campus GP I td				Ground Level:		118.41
Logged By:			JAR				Date Commen	ced:	14/09/2022
Checked By:			SC				Date Complete	vd.	14/09/2022
Type and diame	tor of oquipr	oont:					Shoot No:	.u.	1 Of 1
Dit Dimonsion	eter of equiph	nem.	Longth: 2 10	Wid	th.	1.00	Sheet NO.	Dopthy	1.50
Pit Dimension.			S. TO	Wid		1.00		Deptil.	1.50
1: * Field Ob	sonyation								
1 Field Obs									
2: No groundwa		Northir							
3. Lasting. 440	0241.4	NOLUII	Ig. 180700.987						
4.		Sam	nle or Tests			Strata			
						50140	Water	-	
Туре	Depth (mbgl)		Result		Legend	Depth (mbgl)) Strikes (mbgl)		Strata Description
				0.00 —				Brown sandy grave consists of medium	I. Sand is fine to coarse. Gravel to coarse, sub-rounded to sub-angular
				-		0.20		Very firm* greysih	white garvelly clay. Gravel cosists of MADE GROUND)
ES	0.50			0.50 —		0.55			, , , , ,
				–		0.65		Concrete. (MADE G	ROUND)
								CHALK recovered a	s stiff* greyish white CLAY. (WEST
								IVIELBURT WARLT C	HALK FORMATION)
					┍┍┍┍┍┍┍┍ ┍┍┍┍┍┍┍┍┍				
				1.00 —	┍┍┍┍┍┍┍ ┍┖╓┖╓┖╓┖				
					┍┍┍┍┍┍┍ ┍┖╓┖╓┖╓┖				
D	1.20				<mark>└╖╵╷╵╷╵╷</mark>				
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				5.00 —					
		Sa	ampling Code: U- Undisturbed B - I	arge Disturbed) - Small Distu	urbed W	/-Water (U*)	Non recovery of San	nple
			Jomas Associates Ltd	I - Lakeside House,	1 Furzegroun	d Way, St	tockley Park, UE	11 1BD	
			T: 0843 289 218	/ E: info@jomasas	sociates.com	₩: www.jo	omasassociates	com	

								TRI AL F	PIT RECORD
			<i>C JOMA</i>	3			Exploratory Ho	ble No:	TP13
Site Address:			Zone 5 and ESA Harwell Campus,	Didcot , OX11 0FD			Project No:		P4397J2609
Client:			Harwell Campus GP Ltd				Ground Level:		
Logged By:			JAR				Date Commen	ced:	14/09/2022
Checked By:			SC				Date Complete	ed:	14/09/2022
Type and diame	eter of equipm	ent:	ЈСВ ЗСХ				Sheet No:		1 Of 1
Pit Dimension:			Length: 3.20	Wid	th:	1.00		Depth:	2.80
Remarks			· · · · ·						
1: * - Field Obs	servation								
2: No groundw	ater reported								
3: Soil infiltrati	on testing und	lertaker	n within trial pit						
4:									
		Sam	ple or Tests			Strata			
Туре	Depth (mbgl)		Result		Legend	Depth (mbgl)	Water Strikes (mbgl)		Strata Description
				0.00		0.20		Brown sandy grave to coarse. Gravel co sub-rounded to sub	I with occasional rootlets. Sand is fine onsists of medium to coarse, p-angular flint. (TOPSOIL)
ES	0.50			0.50 —				Firm* greyish white	e CHALK. (HEAD)
				-		0.80		Brown sandy grave	Ily CLAY. Sand is fine to coarse. Gravel
D	1.00			1.00 —		1.10		and occasional cha	soarse sub-rounded to sub-angular filmt lk (HEAD)
D	1.20							MELBURY MARLY C	HALK FORMATION)
				1.50 — — —					
				2.00 —					
D	2.40								
	2.40			2.50 —					
				3.00 —		3.00			
				-					
				3.50 —					
				4 00					
				4.50 —					
				5.00 —					
		Sa	Impling Code: U- Undisturbed B - Jomas Associates Lt T: 0843 289 218	Large Disturbed E d - Lakeside House, 37 E: info@jomasas) - Small Disti 1 Furzegrour sociates.com	urbed W d Way, St N: www.jo	- Water (U*) cockley Park, UE omasassociates	Non recovery of Sar 11 1BD .com	nple

								TRI AL P	PIT RECORD
			JOM	A5			Exploratory Ho	le No:	TP16
Site Address:		Zone 5	and ESA Harwell Car	npus, Didcot , OX11 0FD			Project No:		P4397J2609
Client:		Harwell	Campus GP Ltd				Ground Level:		
Logged By:		JAR					Date Comment	ced:	15/09/2022
Checked By:	ton of one immed	SC					Date Complete	ed:	15/09/2022
Pit Dimension	eter of equipmen	Length	3 10	Wid	th	1.00	Sheet NO:	Denth:	3 10
Remarks		Longtin	0.10	1110		1100		Doptili	
1: *Field descri	ption								
2: No groundwa	ater reported								
3: Soil infiltration	on testing under	taken within I	rial pit						
4:		Sample or To	acto			Strata			
		Sumple of T					Water	1	
Туре	Depth (mbgl)		Result	0.00 —	Legend	Depth (mbgl)	Strikes (mbgl)	Provense de server	Strata Description
				-	<u>-oe</u>	0.20		to coarse. Gravel co sub-rounded to sub	with occasional rootiets. Sand is fine onsists of medium to coarse, -angular flint. (TOPSOIL)
					<u> </u>			Brown sandy grave	Ily CLAY. Sand is fine to coarse. Gravel
				0.50 -		0.70		and chalk (HEAD)	
				-	┍ <u>╶╸</u> ╶╴╴╴╴╴ ┍╖╹╖╹╖╹╖	0.70		CHALK recovered a	s stiff* greyish white CLAY. (ZIG ZAG
				-				CHALK FORMATION)
				-					
				-					
				1.50 —					
				-					
				-					
				2.00 —					
				-					
				-					
				2.50 —	┍╖┍╖┍╖┍╖ ┍┍┍┍┍┍┍┍┍┍ ┍┍┍┍┍┍┍┍┍				
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				3.00		3.10			
				-	-				
				3.50 —	-				
				-					
				4.00 —					
				-					
				-					
				4.50 —					
				-					
				5.00					
		Sampling (Code: U- Undisturbed Jomas Associa T: 0843 28	B - Large Disturbed I tes Ltd - Lakeside House, 9 2187 E: info@jomasas	D - Small Distu 1 Furzegroun sociates.com V	rbed W d Way, Sto V: www.jc	- Water (U*) ockley Park, UB omasassociates.	Non recovery of Sam 11 1BD com	nple

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					J	e]	¥F					Explorat	tory Hole No:			WS1	
Site Address:			Zon	e 5 & I	ESA Ha	rwell C	ampus	, Didco	ot OX11 0	FD		Project	No:			P4397J2609	
Client:			Har	well Ca	mpus	GP Ltd		,				Ground	Level:			117.85	
Logged By:			JAR									Date Co	mmenced:			12/09/2022	
Checked By:			SC									Date Co	mpleted:			12/09/2022	
Type and diame	ter of equipn	nent:	Win	dowles	s Sam	pler Ri	9					Sheet N	0:			1 Of 1	
Date:		ing be	Jing,				T										
Hole depth:																	
Casing depth:																	
Level water on s	strike:																
Water Level after	er 20mins:																
1. *Eield descri	ntion																
2: Groundwater	r not reported	d															
3: Easting: 448	358.586	Nor	thing:	18644	1.819												
4:																	
		Sample	e or Te	ests					-		Strata	Mator	-				
Type	Depth				Resul	t				Leaend	Depth	Strikes	Str	rata De	escription		Installation
.,,,,,,	(mbgl)	75	75	75	75	75	75	N	1	9	(mbgl)	(mbgl)					
									0.00 —	******	\$		Brown sandy grave	el, with o	occasional roo	tlets. Sand	******
ES	0.10								-		3		is fine to coarse. Gr	iravel co	onsists of med	ium to	
											0.20		GROUND - Topsoil))			
									-		\$		Brown sandy grave Gravel consists of f	elly clay fine to c	. Sand is fine oarse sub-and	to coarse. gular to	
ES	0.50								0.50 —				sub-rounded flint a	and chal	k. (MADE GRO	DUND)	
									-		0.60		Asphalt. (MADE GR	ROUND)			
									-	~~~~~~	0.70		Concrete. (MADE G	GROUND))		~~~~~~
									_								
									1.00 —	-							
									-	-							
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									1.50 —	-							
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									2.00 -	-							
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									4.00 -	-							
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									4.50 -	-							
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									-	1							
									5.00 -	-							
		5	Samplir	ng Cod	e: U- l Jon	Jndistu nas Ass	rbed sociate:	B - Lar s Ltd -	ge Distur Lakeside	bed D - Sm House, 1 Fur:	all Disturbed zeground Way	W - Water , Stockley Pa	(U*) Non recovery ark, UB11 1BD	of Sam	ple		
						T: 084	13 289	2187	L: info@jo	masassociate	es.com W: ww	w.jomasasso	ociates.com				

					-	-		-	=			W		OWLESS S	SAMPLING BO	OREHOLE RE	CORD	
						9]	¥ F					Explorat	tory Hole No:			WS2		
Site Address			700	050	50 11~	rwell C	ampur	Dide	nt () V 1 1 4	0ED		Project	No:			P4307 12400		
Client:			Lon			CPLtd	ampus	, Diace		UFD		Ground				110 20		
Logged By:			IAR	Well CE	impus							Date Co	mmenced.			12/09/2022		
Checked By:			SC									Date Co	mpleted:			12/09/2022		
Type and diamet	er of equipn	nent:	Win	dowles	s Sam	pler Rig	7					Sheet N	0:			1 Of 1		
Water levels re	corded du	ing bo	oring,	m			-											
Date:																		
Hole depth:																		
Casing depth:																		
Level water on s	trike:		_															
Water Level after	r 20mins:																	
Remarks	tion																	
2: Groundwater	not reporte	h																
3: Easting: 4482	248.621	Nor	thing:	1864	59.109													
4: **Consistenc	y estimated	using s	semi-e	mpirica	al corre	ations	with S	SPT N-	values, P	lasticity Indices	and publishe	ed literature						
	:	Sample	e or Te	ests							Strata							
	Depth				Result	ł					Depth	Water		Strata De	escription		Instal	lation
Туре	(mbgl)									Legend	(mbgl)	Strikes (mbal)		Strata Bi	sonption			lation
		75	75	75	75	75	75	N	0.00			(mbgi)						
FS	0.10								0.00 -				Brown sandy g	ravel, with	occasional roc	otlets. Sand	E==	
LJ	0.10												coarse, angula	e. Gravel co r to sub-rou	unded flint. (T	OPSOIL)		
										_ <u></u>	0.20				<u></u>		듣려	[
									.				Brown sandy g Gravel consists	ravelly CLA s of fine to a	Y. Sand is fine coarse sub-and	e to coarse. gular to	티크	
ES	0.50								0.50 -				sub-rounded fl	int and cha	Ik. (HEAD)		F====	
									.								E크	133
									· ·		0.80						노크	
											0.00		Structureless (CHALK recov	vered as very	stiff**	논극	
													greyish white (CLAY. (ZIG	ZAG CHALK F	ORMATION)	들크	
U	1.00	2	2	,	,		10	22	1.00 -									
501		3	3	0	°	8	12	32										
										<u>└┲╩┲╩┲╩┲</u>								
									1.50 -	╶┢┸╓┸╓┸╖┸┥								
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D	2.00	_							2.00 -		2.00							× · · ·
SPI		/	10	13	22	26	30	91		7								
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									5.00 -	-								
		S	Samplir	ng Cod	e: U- L	Indistu	rbed	B - Lar	ge Distu	rbed D - Sma	II Disturbed	W - Water	(U*) Non reco	very of San	nple			
		-			Jon	nas Ass	ociate	s Ltd -	Lakeside	House, 1 Furze	eground Way	, Stockley Pa	ark, UB11 1BD					
						1: 084	3 289	2187	_: into@j	omasassociates	.com W: ww	w.jomasasso	ciates.com					

								34	=			W	INDOW/WIND	OWLESS S	AMPLING BO	DREHOLE RE	CORD	
					J	0]	¥ Fa					Explorat	tory Hole No:			WS3		
Site Address			700	e 5 8. 0	SA HA	rwell C	ampus	Dide	nt () ¥11)FD		Project	No			P4397 12600		
Client:			Har			GP Ltd	ampus	, Diuci		510		Ground				117 97		
Logged By:			IAR	Well Oc	mpus							Date Co	mmenced.			12/09/2022		
Checked By:			SC									Date Co	mpleted:			12/09/2022		
Type and diamet	er of equipn	nent:	Win	dowles	s Sam	pler Rid	a					Sheet N	0:			1 Of 1		
Water levels re	ecorded dur	ing bo	ring,	m		<u> </u>	<u>,</u>							I				
Date:																		
Hole depth:																		
Casing depth:																		
Level water on s	trike:																	
Water Level afte	r 20mins:																	
Remarks																		
1: *Field descrip	otion																	
2: Groundwater	not reported	d																
3: Easting: 4483	324.658	Nor	thing:	1864	70.738													
4: **Consistenc	y estimated	using s	semi-e	mpirica	al corre	elations	with S	SPT N-	values, P I	lasticity Indices	and publishe	ed literature						
		Sample T	e or T	ests					-		Strata		-					
-	Depth				Result	t					Depth	Water Strikes		Strata De	escription		Instal	lation
Туре	(mbgl)	75	75	75	75	75	75	N		Legend	(mbgl)	(mbgl)						
									0.00 -				Brown sandy g	ravel. Sand	is fine to coar	rse. Gravel	L	1
ES	0.10												consists of med	dium to coa	rse angular to		논크	
									· ·	-00	0.20		sub-rounded fl	int. (TOPSO		occasional	문려	[====
													rootlets. Sand	is fine to co	arse. Gravel c	consists of	扫扫	[====
													fine to coarse s	sub-angular	to sub-round	ed flint and	扫扫	
ES	0.50								0.50 -				HEAD)				FEE	===
										<u> </u>							Fifi	
																	F===1	
																	F===	
D	1.00								1 00 -								<u>[]]</u>	
SPT	1.00	2	4		6	5	6	21	1.00	- • - •								
511		2	4	"			0	21										
										<u> </u>								
									1.50 -									
											1.60							
										Frrrrrrr			Structureless C	CHALK recov	/ered as very : ZAG CHALK FO	Stiff**		
										┟┍┍┍┍┍┍			greyisir write c	56711. (210)		51(11)/11/01()		
										<mark>┍┍┍┍┍┍┍┍</mark>								
D	2.00								2.00 -	<u> </u>	2.00							
SPT		4	6	12	13	13	12	50		-								
										-								
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		S	amplii	ng Cod	e: U- L Jon	undistu nas Ass	rbed ociates	в - Lar s Ltd -	ge Distu Lakeside	rbed D - Sma House, 1 Furze	II Disturbed ground Way	W - Water , Stockley Pa	(U*) Non reco ark, UB11 1BD	very of Sam	ple			
						T: 084	3 289	2187	E: info@j	omasassociates	.com W: ww	w.jomasasso	ciates.com					

					J	Ø	Y	13				Explora	VI NDOW/WI NDOWI	/LESS S	AMPLING BC	WS4	CORD
Site Address:			Zon	ie 5 & I	ESA Ha	rwell C	ampus	, Didco	ot OX11 OF	D		Project	No:			P4397J2609	
Client:			Har	well Ca	mpus	GP I td						Ground	Level:			118.39	
Logged By:			IAR									Date Co	mmenced.			12/09/2022	
Checked By:			sc									Date Co	mnleted:			12/09/2022	
Type and diamet	er of equipr	nent:	Win	dowles	s Sam	pler Rid	а П					Sheet N	lo:			1 Of 1	
Water levels re	corded du	rina ba	rina.	m			5										
Date:		<u> </u>															
Hole depth:																	
Casing depth:																	
Level water on s	trike:																
Water Level afte	r 20mins:																
Remarks												_					
1: *Field Descri	otion																
2: No Groundwa	ter Reporte	d															
3: Easting: 448	183.848	Nor	thing:	1865	12.503												
4: **Consistenc	y estimated	using s	semi-e	mpirica	al corre	lations	s with S	SPT N-V	values, Pla	sticity Indices	and publishe	ed literature					
		Sample	e or T	ests							Strata						
	Dopth				Posuli	•					Dopth	Water	Str	rata Do	scription		Installation
Туре	(mbal)				Resul					Legend	(mbal)	Strikes	50	iala De	scription		Instanation
	(75	75	75	75	75	75	N			((ingam)					
									0.00 —				Brown sandy grave	el, with d	occasional roo	tlets. Sand	******
ES	0.10								_				is fine to coarse. Gr	iravel co	nsists of medi	ium to	
									_				coarse, angular to s	sub-rou	nded flint. (10	OPSOIL)	
									-		0.40						
									-		0.40		Firm** brown sand	dy grave	Ily CLAY with	occasional	
ES	0.50								0.50 —				rootlets. Sand is fin	ne to coa	arse. Gravel c	onsists of	
									-	<u> </u>			tine to coarse, sub-	-angular	to sub-round	ied flint and	
									_								
									_								
									_								
D	1.00								1.00 —								
SPT		2	3	3	3	4	3	13	_								
									_								
									_								
									_		1 50						
									1.50 —	╶╛╶┄═╘╴╕	1.00		Structureless CHAL	K recov	ered as very s	stiff**	
									-				greyish white CLAY	7. (ZIG Z	AG CHALK FC	ORMATION)	
									_								
									_								
									_		2 00						
D	2.00								2.00 —		2.00						
SPT		8	7	12	14	13	14	53	_								
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									2.50 —								
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		S	amplii	ng Cod	e: U- l Ion	undistu nas Ass	rbed	в-Lar sItd-	ge Disturb Lakeside F	ed D-Sma House 1 Furza	II Disturbed	W - Water	(U*) Non recovery ark. UB11 1BD	or Sam	ріе		
					501	T: 084	13 289	2187	E: info@joi	masassociates	.com W: ww	w.jomasasso	ociates.com				

					J	0]						Explorat	ory Hole No:	SS SAMPLING BO	WS5	CORD	
Site Address			700	e 5 8 1	SA Ha	rwell (ampus	Dide	ot 0X11 0	FD		Project	No.		P4397 12600		
Site Address:			Zon		25A Ha	rweir c	ampus	, Diaco		FD		Project i			117.00		
Client:			Har	well Ca	mpus	GP Ltd						Ground	Level:		117.30		
Logged By:			JAR									Date Co	mmenced:		12/09/2022		
Checked By:			SC									Date Co	mpleted:		12/09/2022		
Type and diamet	er of equipr	nent:	Win	dowles	s Sam	pler Rig	g					Sheet N	0:		1 Of 1		
Water levels re	ecorded du	ring bo	oring,	m													
Date:																	
Hole depth:																	
Casing depth:																	
Level water on s	trike:																
Water Level afte	r 20mins											-					
Remarks	2011110		_														
1: *Eiold Obson	ation																
2: No groupdwo		orod															
2. No groundwa		ereu Nor	thing	1044	1 5 102												
3: Easting: 448.	240.918	NOF	thing:	1800	15.493												
4: **Consistenc	y estimated	using s	semi-e	mpirica	al corre	elations	s with S	SPIN-V	values, Pla I	isticity Indices	and publishe	ed literature					
		Sample	e or T	ests					-		Strata		-				
	Depth				Result	t					Depth	Water	Strata	a Description		Instal	lation
Туре	(mbgl)									Legend	(mbgl)	Strikes (mbal)					
		75	75	75	75	75	75	Ν				(ingain)					
									0.00 —	///////////////////////////////////////			Brown sandy gravel w	ith occasional roo	tlets Sand	<u>L</u>]	+=-=-
ES	0.10								-				is fine to coarse. Grav	el consists of med	lium to		
							1		-		0.00		coarse, angular to sub	o-rounded flint. (T	OPSOIL)	E===	EE
							1		-	╻╹╹╹╹╹╹	<u> </u>		Gravish white claver (FE-EI	[===
							1		-	<mark>┍╹┍╹╹┍╹╹</mark>			Gregisi white clayey (JIALN. (HEAD)		FEE	[===]
							1		0.50 —	<mark>┟╖┶╖┶╖┵╖┙</mark>						F===1	[===]
ES	0.60						1		-	<mark>┟╖┶╖┶╖┵╖┙</mark>						F===1	
							1		-	┟┲╘┲╘┲┖┲┖ ┪┖╗┖╗┖╗┖┥						[-:-]	[=-==
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									_	<u>P p P p P p P p </u>						E	1
D	1 00								1 00 -		1.00						
CDT	1.00	2	2				4	15	1.00	- <u>o</u> o			Firm rapidly becoming	veyr stiff** brow	n sandy		
521		3	3	4	3	4	4	15					gravelly CLAY. Sand is	s fine to coarse. Gi	ravel		
									-	<u>-</u>			sub-rounded chalk and	d flint. (HEAD)	0		
														. ,			
									-								
									1.50 —								
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SPT		2	4	14	12	13	12	51	_								
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		S	Samplii	ng Cod	e: U- L	Indistu	rbed	B - Lar	ge Disturi	oed D - Sma	II Disturbed	W - Water	(U*) Non recovery of	Sample			
					Jon	nas Ass	sociate:	s Ltd -	Lakeside	House, 1 Furze	eground Way	, Stockley Pa	irk, UB11 1BD				
						1. U84	rs 289	∠18/t	1110@J0	masassuciates	.com w: ww	w.jumasasso	ciates.com				

							E	24				W	/INDOW/WINE	OWLESS S	SAMPLING BO	DREHOLE RE	ECORD
					J	SE.		35				Explorat	tory Hole No:			WS6	
Site Address:			Zon	e 5 & I	ESA Ha	rwell C	ampus	s, Didco	ot OX11 OF	D		Project I	No:			P4397J2609	
Client:			Har	well Ca	ampus	GP I td	umpus	, Diace		0		Ground	level:			117 72	
Logged By:			JAR									Date Co	mmenced:			12/09/2022	
Checked By:			SC									Date Co	mpleted:			12/09/2022	
Type and diame	ter of equipr	nent:	Win	dowles	s Sam	pler Rig	3					Sheet N	0:			1 Of 1	
Water levels re	ecorded du	ring bo	oring,	m			-							1			
Date:																	
Hole depth:																	
Casing depth:																	
Level water on s	strike:																
Water Level after	er 20mins:																
Remarks																	
1: *Field Descri	iption																
2: No groundwa	ater reported	 	at la tra av	10/5	75 044												
3: Easting: 448	218.592		rtning:	1865	/5.211	lations	with 9		alues Die	cticity Indicos	and publich	ad litaratura					
4: "Consistenc	cy estimated	using :	semi-e	mpirica	arcorre	ations	with a	SPT IN-V	alues, Pla	sticity malces	Stroto	ed interature					
		Sampi	eorn	ests							Silaia	Water	-				
Type	Depth				Result	t i				Logond	Depth	Strikes		Strata De	escription		Installation
туре	(mbgl)	75	75	75	75	75	75	N		Legena	(mbgl)	(mbgl)					
		75	75	75	75	75	75	IN	0.00 —								
									_				Brown sandy g	ravel with c	occasional root	lets. Sand	
ES	0.20								_				coarse, angula	r to sub-rou	unded flint. (T	DPSOIL)	
-									_								
									_								
ES	0.50								0.50 —		0.50		Structuroloss (vorod as firm*	* rapidly	
									_				becoming very	stiff** grey	yish white CLA	Y. (WEST	
									_				MELBURY MAR	LY CHALK F	ORMATION)		
									-								
									_								
SPT	1.00	2	2	3	3	3	4	13	1.00 —	<mark>┍┍┍┍┍┍┍</mark>							
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U	2.00		10	14	14	1/	15		2.00 —								
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		5	Samplir	ng Cod	e: U- L	Indistu	rbed	B - Lar	ge Disturb	ed D - Sma	II Disturbed	W - Water	(U*) Non reco	very of Sam	nple		
					Jon	nas Ass	ociate	s Ltd -	Lakeside I	House, 1 Furze	eground Way	, Stockley Pa	ark, UB11 1BD				
						1: 084	3 289	2187 E	⊥: into@joi	masassociates	.com W: ww	w.jomasasso	ciates.com				

						_		_	-			V	VINDOW/WIND	OWLESS S	SAMPLING BC	REHOLE RE	CORD	
					J	9]	¥ P.	13				Explorat	tory Hole No:			WS7		
Site Address			700	0 E 9 I	5 A 110	rwoll (`ompur	Didor	+ 0 1 1 0	-D		Draiget	No			D420712600		
Client:			ZUII				ampus	, Diuce		0		Project	NO.			117.20		
				well Ca	impus	GP Llu						Ground	Level.			117.30		
Chockod But			JAR									Date Co	mplatad			13/09/2022		
Type and diamet	tor of oquing	nont:	- Min	dowlos	e Sam	nlor Di	~					Shoot N				1 Of 1		
Water levels re		ring bo	ring	m	3 5411		9					Sheet N	10.			1011		
Date:		ing be	, ing,															
Hole denth																		
Casing depth:																		
Level water on s	trike:																	
Water Level afte	r 20mins:																	
Remarks			_															
1: *Field descrip	otion																	
2: No groundwa	ter reported																	
3: Easting: 448	246.908	Nor	thing:	1866	15.484													
4: **Consistence	y estimated	using s	semi-e	mpirica	al corre	elations	with S	SPT N-\	values, Pla	sticity Indice	s and publishe	ed literature	-					
		Sample	e or Te	ests							Strata							
	Depth				Result	t					Depth	Water		Strata De	escription		Insta	llation
Туре	(mbgl)			-		-				Legend	(mbgl)	(mbal)						
		75	75	75	75	75	75	N	0.00			(
									0.00 —				Soft consistency	y* brown g	gravelly clay wi	ith	F==3	1-1-1
									_		0.05		flint (TOPSOIL)	lets. Grave N	l consists of fir	ne to coarse	F===1	
ES	0.25										g U.25		Stiff consistency	, v* ljaht bri	own gravelly C	LAY, Gravel	문리	
													consists of fine	angular ch	alk and flint. (HEAD)	논크	
FS	0.50								0.50 —	<u> </u>	1						<u>t==</u>]	
									_								별려	[====
									_								臣日	[===]
									_	╤╤╤╤╤╤	0.80		Structuroloss ()	HALK reco	vorod as stiff t		F==1	===
									_				stiff** grey silty	y CLAY. (W	EST MELBURY	MARLY	FIFI	
ES	1.00								1.00 —				CHALK FORMAT	ION)			[===]	
SPT		3	3	4	4	5	6	19	_									§
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									_	<mark>╷┍╷┍╷┍╷┍</mark>								<u>]</u>
									_	<mark>╷┍╷┍╷┍╷┍</mark>	-							
									1.50 —	╷┍┍┍┍┍┍┍								<u></u>
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									_	<mark>╷╷╷╷╷╷╷</mark>	1							
									_	<mark>╷╷╷╷╷╷╷</mark>	1							<u></u>
D	2.00								2 00 -		2.00							
SPT	2.00	8	q	12	12	13	13	50	2.00									
511				12	12		15		_									
									_									
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		S	Samplir	ng Cod	e: U- L	Jndistu	rbed	B - Lar	ge Disturb	ed D - Sm	all Disturbed	W - Water	(U*) Non recov	very of San	nple			
					Jon	nas Ass T: 08/	sociate: 13.280	s Ltd - 2187 F	Lakeside I	House, 1 Furz masassociate	eground Way	v, Stockley Pa w.iomasasso	агк, UB11 1BD ociates.com					
							- 20/			2220000000		.,						

									W	/INDOW/WIND	OWLESS S	SAMPLING BO	DREHOLE RE	ECORD)			
					J	9]	i E					Explorat	tory Hole No:		WS8			
Site Address			700	0 5 9 1		ruoll C	ompus	Dido	ot 0V11 (Drojoct	No			D420712400		
Client:			Har			GP Ltd	ampus	, Diace		JFD		Ground			118 79			
Logged By:			IAR	Well Ca	impus							Date Co	mmenced:		13/09/2022			
Checked By:			SC									Date Co	mpleted:			13/09/2022		
Type and diamet	er of equipr	nent:	Win	dowles	s Sam	pler Rid	1					Sheet N	lo:			1 Of 1		
Water levels re	corded du	ring bo	pring,	m			,						-					
Date:																		
Hole depth:																		
Casing depth:																		
Level water on s	trike:																	
Water Level afte	r 20mins:																	
Remarks																		
1: *Field Descrip	otion																	
2: No groundwa	ter reported	1																
3: Easting: 448	138.135	Nor	thing:	1866	41.197													
4:		Sample	o or T	octo							Stroto							
		Sample	e or Te	ests					-		Strata	Wator	-					
Туре	Depth (mbgl)	75	75	75	Resul	t 75	75	N	-	Legend	Depth (mbgl)	Strikes (mbgl)	Strata Description				Installation	
FS	0.10	75	75	75	75	10	70		0.00 -				Soft consistency	y* brown s	andy clay with	n occasional		E
	5.10								.		0.10		Topsoil)	s nne to co	ai se. (IVIADE (UNDOND -	1	[====
									-		0.20		Concrete Slab (MADE GRO	DUND).			[====
									-		8		Gravel comprisi	ing angular	r concrete and	asphalt.		
ES	0.50								0.50 -		8		(MADE GROUNL))				
									-		×							
											×							
									-		×							Ø
									-		X							Ø
D	1.00								1.00 -		Š.						×××	
SPT		3	3	4	5	13		22	-		1 20							
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									-									
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									5.00 -	-								
		<	amnlir	na Cod	e: U- I	Indistu	rbed	B-lan	ae Distur	bed D - Sm	all Disturbed	W - Water	(U*) Non recov	erv of San	nple			
				5 - 54	Jon	nas Ass	ociates	s Ltd -	Lakeside	House, 1 Fur	zeground Way	, Stockley Pa	ark, UB11 1BD	, <u>.</u>	•			
						T: 084	3 289	2187 I	E: info@jo	omasassociat	es.com W: ww	w.jomasasso	ociates.com					



APPENDIX 3 – CHEMICAL LABORATORY TEST RESULTS





Shaw Carter Jomas Associates Ltd Lakeside House 1 Furzeground Way Stockley Park UB11 1BD

i2 Analytical Ltd. 7 Woodshots Meadow, Croxley Green Business Park, Watford, Herts, WD18 8YS

- t: 01923 225404
- f: 01923 237404
- e: reception@i2analytical.com

e: Jomas Associates -

Analytical Report Number : 22-85708

Project / Site name:	Zone 5 and ESA Harwell campus, Didcot OX11	Samples received on:	20/09/2022
Your job number:	JJ2609	Samples instructed on/ Analysis started on:	22/09/2022
Your order number:	P4397JJ2609.14	Analysis completed by:	30/09/2022
Report Issue Number:	1	Report issued on:	30/09/2022
Samples Analysed:	5 leachate samples - 22 soil samples		

Nonja Signed:

Dominika Warjan Junior Reporting Specialist For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Lab Sample Number				2433418	2433419	2433420	2433421	2433422
Sample Reference				WS1	WS2	WS3	WS4	WS5
Sample Number				None Supplied				
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	8.2	8.7	7.1	13
Total mass of sample received	kg	0.001	NONE	1	1	1	1	1
							•	
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSA	DSA	DSA	DSA	DSA
General Inorganics	pH Units	N/A	MCERTS	7.8	75	81	7.6	79
Total Cvanide	ma/ka	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	1100	770	1000	250	910
water Soluble SO4 16nr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.007	0.0053	0.0079	0.0015	0.0044
Equivalent)	mg/l	1.25	MCERTS	7	5.3	7.9	1.5	4.4
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs					•		-	
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Eluorene	ma/ka	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

lidorene		0.05	HOLINIO	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.38	1.7	< 0.05	< 0.05	3.6
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.45	< 0.05	< 0.05	0.96
Fluoranthene	mg/kg	0.05	MCERTS	1.3	7.2	0.63	< 0.05	7
Pyrene	mg/kg	0.05	MCERTS	1.2	6.6	0.58	< 0.05	6.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.88	5	0.38	< 0.05	3.3
Chrysene	mg/kg	0.05	MCERTS	0.66	3.3	0.32	< 0.05	2.6
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.92	3.9	0.44	< 0.05	2.9
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.55	3.4	0.28	< 0.05	2.3
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.94	4.8	0.43	< 0.05	3.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.54	2.7	< 0.05	< 0.05	1.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.7	< 0.05	< 0.05	0.37
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.66	3.1	< 0.05	< 0.05	2.1

Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	8	42.9	3.06	< 0.80	36.4
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.3	13	11	11	8.2
Boron (water soluble)	mg/kg	0.2	MCERTS	2.9	2.2	2.5	0.7	1.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.5	0.4	< 0.2	0.5
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	33	26	30	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	10	14	7.9	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	36	38	36	16	98
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	27	24	24	17
Selenium (agua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

< 1.0

71

< 1.0

81

< 1.0

66

< 1.0

44

Selenium (aqua regia extractable)

Zinc (aqua regia extractable)

mg/kg

1

MCERTS

< 1.0

62





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Lab Sample Number	Sample Number					2433420	2433421	2433422
Sample Reference				WS1	WS2	WS3	WS4	WS5
Sample Number				None Supplied				
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
		Lir						
		nito	Acc					
Analytical Parameter	Uni	ofd	redi Stat					
(Soil Analysis)	ts	ete	tati					
		ctio	9					
N		ă.						
Monoaromatics & Oxygenates			MCEDTO	4.0				
Benzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Toluene	µg/кд	1	MCERTS	< 1.0	-	-	-	-
Ethylbenzene	µд/кд	1	MCERTS	< 1.0	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µу/ку	1	MCERTS	< 1.0	-	-	-	-
Petroleum Hydrocarbons		0.1	MOTOTO					
Petroleum Range Organics (C6 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7 HS 1D AR	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8 HS 1D AR	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10 HS 1D AR	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12 FH CIL 1D AR	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16 FH CU 1D AR	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21 EH CULID AR	mg/kg	10	MCERTS	< 10	-	-	-	_
TPH-CWG - Aromatic >EC21 - EC35 EN CULID AD	mg/kg	10	MCERTS	32	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35) FH CIL+HS 1D AR	mg/kg	10	MCERTS	37	-	-	-	-
TPH (C10 - C12) TH CH ID TOTAL	mq/kq	2	MCERTS	-	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) ru cu up Total	ma/ka	4	MCERTS	-	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) FU CU ID TOTAL	ma/ka	1	MCERTS	-	22	< 1.0	< 1.0	13
TPH (C21 - C40) FH CU 1D TOTAL	mg/kg	10	MCERTS	-	84	< 10	< 10	51
					01	10	10	51
VOCs								
Chloromothano	ua/ka	1	ISO 17025	< 1.0	_	_	_	-
Chloroethane	ug/kg	1	NONE	< 1.0	_	_	-	_
Bromomothano	ug/kg	1	ISO 17025	< 1.0	_	_	_	_
Vipyl Chlorido	µg/kg	1	NONE	< 1.0				_
Trichlorofluoromethano	µg/kg	1	NONE	< 1.0	-	-	-	-
	µg/kg	1	NONE	< 1.0	-	-	-	-
1,1-Dichloroethene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Cis 1.2 disklassethere	µg/kg	1	MCEDTS	< 1.0	-	-	-	-
CIS-1,2-CICHIOFOELHENE	µg/kg	1	MCEDTS	< 1.0	-	-	-	-
	µg/kg	1	MCEDIC	< 1.0	-	-	-	-
	µg/kg	1	MCEDIC	< 1.0	-	-	-	-
	µg/kg	1	MCEDIC	< 1.0	-	-	-	-
	µg/kg	1	MCEDIC	< 1.0	-	-	-	-
1,1,1-iricnioroetnane	µg/kg	1	MCEDIC	< 1.0	-	-	-	-
1,2-Dichloroethane	µу/кд	1	MCEDIC	< 1.0	-	-	-	-
1,1-UICNIOropropene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
I rans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	-	-	-
Benzene	µу/кд	1	MCERTS	< 1.0	-	-	-	-
I etrachloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Lab Sample Number	Sample Number					2433420	2433421	2433422
Sample Reference				WS1	WS2	WS3	WS4	WS5
Sample Number				None Supplied				
Depth (m)				0.10	0.10	0.10	0.10	0.10
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Styrene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Tribromomethane	µg/kg	1	NONE	< 1.0	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	-	-	-

Miscellaneous Organics	iscellaneous Organics									
Coal Tar		N/A	NONE	-	-	-	-	-		
Total Residue	mg/kg	10	NONE	-	-	-	-	-		

U/S = Unsuitable Sample I/S = Insufficient Sample





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

l ab Sample Number				2433423	2433424	2433425	2433426	2433427
Sample Reference				WS6	WS7	WS8	WS8	WS8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Denth (m)				0.10	0.25	0.10	0.50	1.00
Depth (m)				21/00/2022	21/00/2022	21/00/2022	21/00/2022	21/00/2022
Time Taken				Z1/09/2022	21/09/2022	21/09/2022	21/09/2022	Z1/09/2022
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	None Supplied	ivone Supplied	None Supplied	ivone Supplied	ivone Supplied
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	51	-
Moisture Content	%	0.01	NONE	9.3	11	15	9.3	-
Total mass of sample received	kg	0.001	NONE	1	1	1	1	-
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSA	DSA	DSA	N/A	DSA
General Inorganics pH - Automated	pH Units	N/A	MCERTS	7.8	7.7	7.9	11.1	-
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Total Sulphate as SO4	mg/kg	50	MCERTS	650	930	2000	4800	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.011	0.011	0.0035	0.056	-
Equivalent)	mg/l	1.25	MCERTS	10.9	11.1	3.5	56.1	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.2	< 1.0	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.9	< 0.05	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.22	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.38	3.5	0.58	-
Pyrene	mg/kg	0.05	MCERTS	< 0.05	0.37	3.3	0.67	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.19	1.9	0.58	-
Chrysene	ma/ka	0.05	MCERTS	< 0.05	0.24	2.2	0.4	_

Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.24	2.6	0.89	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.22	1.7	0.27	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.25	2.4	0.73	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.6	0.46	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.37	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.9	0.52	-

mg/kg	0.8	MCERTS	< 0.80	1.89	22.7	5.1	-
mg/kg	1	MCERTS	11	12	7.4	24	-
mg/kg	0.2	MCERTS	1.5	2.3	3.3	1.3	-
mg/kg	0.2	MCERTS	< 0.2	0.5	0.5	< 0.2	-
mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	-
mg/kg	1	MCERTS	28	41	14	23	-
mg/kg	1	MCERTS	7.4	9.7	24	31	-
mg/kg	1	MCERTS	21	66	70	15	-
	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	mg/kg 0.8 mg/kg 1 mg/kg 0.2 mg/kg 0.2 mg/kg 1.8 mg/kg 1 mg/kg 1	mg/kg 0.8 MCERTS mg/kg 1 MCERTS mg/kg 0.2 MCERTS mg/kg 0.2 MCERTS mg/kg 1.8 MCERTS mg/kg 1 MCERTS	mg/kg 0.8 MCERTS < 0.80 mg/kg 1 MCERTS 11 mg/kg 0.2 MCERTS 1.5 mg/kg 0.2 MCERTS < 0.2	mg/kg 0.8 MCERTS < 0.80 1.89 mg/kg 1 MCERTS 11 12 mg/kg 0.2 MCERTS 1.5 2.3 mg/kg 0.2 MCERTS < 0.2	mg/kg 0.8 MCERTS < 0.80 1.89 22.7 mg/kg 1 MCERTS 11 12 7.4 mg/kg 0.2 MCERTS 1.5 2.3 3.3 mg/kg 0.2 MCERTS < 0.2	mg/kg 0.8 MCERTS < 0.80 1.89 22.7 5.1 mg/kg 1 MCERTS 11 12 7.4 24 mg/kg 0.2 MCERTS 1.5 2.3 3.3 1.3 mg/kg 0.2 MCERTS < 0.2

< 0.3

< 0.3

< 0.3

< 0.3

MCERTS

mg/kg

0.3

Mercury (aqua regia extractable)





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Lab Sample Number		2433423	2433424	2433425	2433426	2433427		
Sample Reference				WS6	WS7	WS8	WS8	WS8
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.25	0.10	0.50	1.00
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
	1	_	1	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
		imi	A					
Analytical Parameter	ç	of,	Sta					
(Soil Analysis)	nits	det	dita					
		ecti	s' tion					
		ion	-					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
p & m-xvlene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
o-xvlene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
				\$ 1.0		\$ 1.0	\$ 1.0	
Petroleum Hydrocarbons								
Petroleum Range Organics (C6 - C10) us us anno	ma/ka	0.1	MCERTS		< 0.1			
Petroledin Kange Organics (Co - CTO) HS_1D_TOTAL	iiig/kg	0.1	HCERTS	-	< 0.1	-	-	-
		0.001	MORDER			-		
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	-	< 1.0	2.1	-
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	-	< 2.0	39	-
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	-	< 8.0	71	-
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	-	< 8.0	180	-
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	< 10	-	< 10	290	-
TPH-CWG - Aromatic >EC5 - EC7 He ID AD	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic > EC3 - EC8 up up up	ma/ka	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 μ_{rs} μ_{rs}	ma/ka	0.001	MCERTS	< 0.001	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 - R_{AR}	ma/ka	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH_{CU_{1D}_{AR}}}$	ma/ka	2	MCERTS	< 2.0		< 2.0	~ 1.0	_
TPH-CWG - Atomatic > EC12 - EC10 $_{EH_{CU}_{1D}_{AR}}$	mg/kg	10	MCERTS	< 2.0	-	< 2.0	7.5	-
TPH-CWG - Alomatic > EC10 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	-	14	20	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH_{CU_{1D_{AR}}}}$	mg/kg	10	MCERTS	< 10	-	84	52	-
TPH-CWG - Aloinauc (ECS - ECSS) EH_CU+HS_ID_AR	ilig/kg	10	FICER13	< 10	-	98	/9	-
TPH (C10 - C12) _{EH_CU_1D_TOTAL}	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH (C12 - C16) _{EH_CU_1D_TOTAL}	mg/kg	4	MCERTS	-	< 4.0	-	-	-
TPH (C16 - C21) EH_CU_1D_TOTAL	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH (C21 - C40) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	-	< 10	-	-	-
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Chloroethane	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
Bromomethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
1.1-Dichloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
1.1.2-Trichloro 1.2.2-Trifluoroethane	µg/kq	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Cis-1.2-dichloroethene	µa/ka	1	MCERTS	< 1.0	-	< 1.0	< 1.0	
MTRE (Methyl Tertiany Butyl Ether)	µa/ka	1	MCERTS	< 1.0		< 1.0	< 1.0	
1 1-Dichloroethane	10/kg	1	MCERTS	< 1.0		< 1.0	< 1.0	
	P9/N9	1	MCEDTC	< 1.0 < 1.0	-	< 1.0	< 1.0 < 1.0	-
2,2-Dichloropropane	µg/kg	1	MCEDIC	< 1.0	-	< 1.0	< 1.0	-
	µg/kg	1	MCEDTC	< 1.0	-	< 1.0	< 1.0	-
1,1,1-Irichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,2-Dichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Totrachloromothano	ua/ka	1	MCERTS	< 1.0		< 1.0	< 1.0	





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Lab Sample Number				2433423	2433424	2433425	2433426	2433427
Sample Reference				WS6	WS7	WS8	WS8	WS8
Sample Number				None Supplied				
Depth (m)				0.10	0.25	0.10	0.50	1.00
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Trichloroethene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Dibromomethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
p & m-Xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Styrene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Tribromomethane	µg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	-
o-Xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Bromobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
n-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Butylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	-

Miscellaneous Organics								
Coal Tar		N/A	NONE	-	-	-	Not Identified	-
Total Residue	mg/kg	10	NONE	-	-	-	390	-

U/S = Unsuitable Sample I/S = Insufficient Sample





Benzo(b)fluoranthene

Benzo(k)fluoranthene

Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Lab Sample Number				2433428	2433429	2433430	2433431	2433432
Sample Reference				BH1	BH2	TP2	TP3	TP4
Sample Number				None Supplied				
Depth (m)				0.50	0.30	0.50	0.40	0.40
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	15	17	13	12
Total mass of sample received	kg	0.001	NONE	1	1	1	1	1
Asbestos in Soil	Туре	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	DSA	GFI	GFI	GFI	N/A
General Inorganics pH - Automated	pH Units	N/A	MCERTS	8	7.3	8.1	8.5	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	750	1000	270	340	190
	g/l	0.00125	MCERTS	0.016	0.024	0.0086	0.026	< 0.0013
Equivalent)	mg/l	1.25	MCERTS	15.5	24.2	8.6	25.5	< 1.3
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.4	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.41	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	3.6	0.41	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	3.2	0.36	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2	0.25	< 0.05	< 0.05	< 0.05
Chrysona	ma/ka	0.05	MCERTS	17	0.26	< 0.0F	< 0.0F	< 0.0F

Benzo(a)pyrene	mg/kg	0.05	MCERTS	2	0.28	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.24	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(abi)nen/lene	mg/kg	0.05	MCERTS	1.3	< 0.05	< 0.05	< 0.05	< 0.05
Denzo(gni)perviene				-				
Total PAH		1						
Total PAH Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	20.3	2.01	< 0.80	< 0.80	< 0.80

2.1

1.2

0.2

0.25

< 0.05

< 0.05

< 0.05

< 0.05

< 0.05

< 0.05

MCERTS

MCERTS

0.05

0.05

mg/kg

mg/kg

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	9	9.8	19	14
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	2.2	0.6	1.4	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.4	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	24	27	41	33
Copper (aqua regia extractable)	mg/kg	1	MCERTS	11	10	6.4	13	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	37	22	15	19	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	21	22	46	39
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68	52	42	63	45





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Lab Sample Number				2433428	2433429	2433430	2433431	2433432
Sample Reference				BH1	BH2	TP2	TP3	TP4
Sample Number				None Supplied				
Depth (m)				0.50	0.30	0.50	0.40	0.40
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Petroleum Hydrocarbons Petroleum Range Organics (C6 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	-	-	< 2.0	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	-	-	< 8.0	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	-	-	< 8.0	< 8.0	-
TPH-CWG - Aliphatic (EC5 - EC35) EH_CU+HS_1D_AL	mg/kg	10	MCERTS	-	-	< 10	< 10	-
TPH-CWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	-	-	< 2.0	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	< 10	< 10	-
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	-	< 10	< 10	-
IPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	-	-	< 10	< 10	-
			1105075			1		
TPH (C10 - C12) $_{\text{EH}_{\text{CU}_{1D}_{\text{TOTAL}}}$	mg/kg	2	MCERIS	< 2.0	< 2.0	-	-	< 2.0
TPH (C12 - C16) EH_CU_1D_TOTAL	mg/kg	4	MCERTS	< 4.0	< 4.0	-	-	< 4.0
TPH (C16 - C21) $_{\text{EH}_{\text{CU}_{1D}_{\text{TOTAL}}}$	mg/kg	1	MCERTS	13	< 1.0	-	-	< 1.0
1PH (C21 - C40) EH_CU_1D_TOTAL	ing/kg	10	MUCERTS	52	< 10	-	-	< 10
VOCs								

Chloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Chloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Bromomethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Trichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Lab Sample Number	ample Number				2433429	2433430	2433431	2433432
Sample Reference				BH1	BH2	TP2	TP3	TP4
Sample Number				None Supplied				
Depth (m)				0.50	0.30	0.50	0.40	0.40
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Trichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Dibromomethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Styrene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Tribromomethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
o-Xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Bromobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	150 17025	-	-	< 1.0	< 1.0	-

Miscellaneous Organics								
Coal Tar		N/A	NONE	-	-	Not Identified	Not Identified	-
Total Residue	mg/kg	10	NONE	-	-	< 10	< 10	-

U/S = Unsuitable Sample I/S = Insufficient Sample




Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Lab Sample Number				2433433	2433434	2433435	2433436	2433437
Sample Reference				TP5	TP6	TP7	TP9	TP10
Sample Number				None Supplied				
Depth (m)				0.40	0.50	0.50	0.50	0.50
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	4.8	11	8.9	11	6
Total mass of sample received	kg	0.001	NONE	1	1	0.6	0.6	0.6
Asbestos in Soil	Туре	N/A	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	7	8	8.3	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	370	240	180	600	200
Water Soluble SU4 16nr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0024	0.0023	0.0016	0.0081	0.0014
Equivalent)	mg/l	1.25	MCERTS	2.4	2.3	1.6	8.1	1.4
Total Phenois								
	malka	1	MCEDTC					

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								

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Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	15	9.6	5.9	8.3
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	1	0.4	0.9	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	47	35	18	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	7.2	10	6.7	4	5.7
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	16	15	6.4	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	41	26	18	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (agua regia extractable)	mg/kg	1	MCERTS	41	69	50	25	42





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Lab Sample Number				2433433	2433434	2433435	2433436	2433437
Sample Reference				TP5	TP6	TP7	TP9	TP10
Sample Number				None Supplied				
Depth (m)				0.40	0.50	0.50	0.50	0.50
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates					-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
recipiedin Range organics (co cito) HS_ID_TOTAL				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC5 - EC6	ma/ka	0.001	MCERTS	_	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8 \dots \dots	ma/ka	0.001	MCERTS			-	-	-
TPH-CWG - Aliphatic > $EC0 + EC10 + EC10$	ma/ka	0,001	MCERTS	_	_	-	_	-
TPH-CWG - Aliphatic >EC10 - EC12 $r_{HS_{1}D_{AL}}$	ma/ka	1	MCERTS			-	_	
TPH-CWG - Aliphatic > EC12 - EC16 $\mu_{\rm CU1D}$	ma/ka	2	MCERTS	_	_	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21 $= -1010 \text{ EM}_{-10}$	ma/ka	8	MCERTS	-	_	-	-	-
TPH-CWG - Aliphatic > $EC21 - EC35 = 0.000$	mg/ka	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35) FH CILLER 10 AL	mg/kg	10	MCERTS	-	-	-	-	-
· · · · · · · · · · · · · · · · · · ·								
TPH-CWG - Aromatic >EC5 - EC7 HS 1D AP	mg/kq	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC7 - EC8 HS 1D AR	mg/kq	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10 HS 1D AP	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12 FH CILLID AR	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16 FH CIL 1D AR	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21 EH CU 1D AR	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35 EH CU 1D AR	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35) EH_CU+HS_1D_AR	mg/kg	10	MCERTS	-	-	-	-	-
	-		-		-		-	-
TPH (C10 - C12) EH CU 1D TOTAL	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH (C12 - C16) _{EH_CU_1D_TOTAL}	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
TPH (C16 - C21) EH_CU_ID_TOTAL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH (C21 - C40) EH_CU_ID_TOTAL	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
VOCs	-							

Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Lab Sample Number				2433433	2433434	2433435	2433436	2433437
Sample Reference				TP5	TP6	TP7	TP9	TP10
Sample Number				None Supplied				
Depth (m)				0.40	0.50	0.50	0.50	0.50
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-Xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

Miscellaneous Organics								
Coal Tar		N/A	NONE	-	-	-	-	-
Total Residue	mg/kg	10	NONE	-	-	-	-	-





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Tour order No. P4557552005.3

Lab Sample Number				2433438	2433439
Sample Reference				TP11	TP12
Sample Number				None Supplied	None Supplied
Depth (m)				0.80	0.30
Date Sampled				21/09/2022	21/09/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	2.9
Total mass of sample received	kg	0.001	NONE	0.6	0.3
Asbestos in Soil	Туре	N/A	ISO 17025	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	N/A	GFI

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.1	9.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Total Sulphate as SO4	mg/kg	50	MCERTS	200	750
Equivalent)	g/l	0.00125	MCERTS	0.0094	0.04
Equivalent)	mg/l	1.25	MCERTS	9.4	39.5

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	2.8
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	6.5
Fluorene	mg/kg	0.05	MCERTS	< 0.05	4.5
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	46
Anthracene	mg/kg	0.05	MCERTS	< 0.05	12
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	34
Pyrene	mg/kg	0.05	MCERTS	< 0.05	27
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	11
Chrysene	mg/kg	0.05	MCERTS	< 0.05	9
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	8.5
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	3.8
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	7.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	2.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.85
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	3.2

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	180

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	7.5
Boron (water soluble)	mg/kg	0.2	MCERTS	1	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.3
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	50	12
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	5.7
Lead (aqua regia extractable)	mg/kg	1	MCERTS	15	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	38	9.4
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (agua regia extractable)	mg/kg	1	MCERTS	71	30





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P43973J2609.14

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Lab Sample Number				2433438	2433439
Sample Reference				TP11	TP12
Sample Number				None Supplied	None Supplied
Depth (m)				0.80	0.30
Date Sampled				21/09/2022	21/09/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Monoaromatics & Oxygenates					
Benzene	µg/kg	1	MCERTS	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0
o-xylene	µg/kg	1	MCERTS	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0
Petroleum Hydrocarbons			<u>.</u>		
Petroleum Range Organics (C6 - C10) HS_1D_TOTAL	mg/kg	0.1	MCERTS	< 0.1	-
					-
TPH-CWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.001	MCERTS	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 HS 1D AL	mg/kg	0.001	MCERTS	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 HS 1D AL	mg/kg	0.001	MCERTS	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 EH CU 1D AL	mg/kg	1	MCERTS	-	2.4
TPH-CWG - Aliphatic >EC12 - EC16 FH CI 1D AI	mg/kg	2	MCERTS	-	16
TPH-CWG - Aliphatic >EC16 - EC21 FH CI 1D AI	mg/kg	8	MCERTS	-	35
TPH-CWG - Aliphatic >EC21 - EC35 FH (1 10 Al	mg/kg	8	MCERTS	-	250
TPH-CWG - Aliphatic (EC5 - EC35) EH CU+HS 1D AL	mg/kg	10	MCERTS	-	310
TPH-CWG - Aromatic >EC5 - EC7 HS 1D AP	mg/kg	0.001	MCERTS	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 up up up	ma/ka	0.001	MCERTS	-	< 0.001
TPH-CWG - Aromatic > EC8 - EC10 Hc 10 AR	mg/kg	0.001	MCERTS	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 ru cu an an	mg/kg	1	MCERTS	-	3.8
TPH-CWG - Aromatic >EC12 - EC16 $= 1012 \text{ em}_{CU}$ and an	ma/ka	2	MCERTS	-	34
TPH-CWG - Aromatic >EC16 - EC21 rul cu to to	ma/ka	10	MCERTS	-	120
TPH-CWG - Aromatic >EC21 - EC35 = $\mu_{CU_1D_4R}$	ma/ka	10	MCERTS	-	340
TPH-CWG - Aromatic (EC5 - EC35) EH CULHS 1D AP	mg/kg	10	MCERTS	-	500
	0. 0				500
TPH (C10 - C12)	ma/ka	2	MCERTS	< 2.0	
TPH (C12 - C16) $= 10 \pm 10$	ma/ka	4	MCERTS	< 4.0	_
TPH (C16 - C21) $= 100 \text{ mm}$	ma/ka	1	MCERTS	< 1.0	_
TPH (C10 C21) EH_CU_1D_TOTAL	mg/kg	10	MCERTS	< 1.0	
TTT (C21 CHO) EH_CO_ID_IOTAL				< 10	-
VOCs			100 17005		
Chloromethane	µg/kg	1	150 1/025	-	< 1.0
Chloroethane	µg/kg	1	NONE	-	< 1.0
Bromomethane	µg/kg	1	150 17025	-	< 1.0
Vinyl Chloride	µg/kg	1	NONE	-	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	-	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	-	< 1.0
1,1,2-I richloro 1,2,2-Trifluoroethane	µg/kg	1	150 17025	-	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0

MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	-	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	-	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	< 1.0
Benzene	µg/kg	1	MCERTS	-	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	< 1.0





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11 Your Order No: P4397JJ2609.14

Tour order No. P4557552005.1

Lab Sample Number	2433438	2433439			
Sample Reference				TP11	TP12
Sample Number				None Supplied	None Supplied
Depth (m)				0.80	0.30
Date Sampled				21/09/2022	21/09/2022
Time Taken				None Supplied	None Supplied
		Ę			
Analytical Parameter (Soil Analysis)	Units	nit of detection	Accreditation Status		
1,2-Dichloropropane	µg/kg	1	MCERTS	-	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	-	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	< 1.0
Tetrachloroethene	µg/kg	1	NONE	-	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	-	< 1.0
Styrene	µg/kg	1	MCERTS	-	< 1.0
Tribromomethane	µg/kg	1	NONE	-	< 1.0
o-Xylene	µg/kg	1	MCERTS	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	-	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	-	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	-	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	-	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	< 1.0
Butylbenzene	µg/kg	1	MCERTS	-	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	-	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	< 1.0

Miscellaneous Organics							
Coal Tar		N/A	NONE	-	Not Identified		
Total Residue	mg/kg	10	NONE	-	530		





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11

Your Order No: P4397JJ2609.14								
Lab Sample Number				2433440	2433441	2433442	2433443	2433444
Sample Reference				WS1	WS6	WS8	BH5	TP1
Sample Number				None Supplied				
Depth (m)				0.10	0.50	0.50	0.30	0.40
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
General Inorganics								
pH (automated)	pH Units	N/A	ISO 17025	7.6	8.2	10.7	7.9	7.8
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO ₄	µg/I	100	ISO 17025	1790	1020	6810	1820	2440
Total Phonoic			-	-	-	-	-	
Total Phenols (monohydric)	ua/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
	-31			< 10	< 10	< 10	< 10	< 10
Speciated BAHs								
Nankthalana	ua/I	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	- 0.01
	µg/1	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/I	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphtnene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	μ9/1	0.01	150 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	150 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	150 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/1	0.01	150 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	150 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/1	0.01	150 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/1	0.01	150 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/I	0.01	150 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(gni)perviene	1971	0.01	HONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total PAH	uq/l	0.2	NONE	. 0.2	. 0.2	. 0.2	. 0.2	. 0.2
TOTAL EPA-10 PARS	197	012	HOHE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Honur Motols / Motolloids								
Arconic (discolved)	10/	1	ISO 17025	< 1.0	< 1.0	2.2	< 1.0	1.1
Arsenic (dissolved)	µg/l	10	ISO 17025	< 1.0	< 1.0	3.3	< 1.0	21
Cadmium (dissolved)	P9/1	0.08	ISO 17025	1/	< 0.06	14 < 0.09	LD 0.00	< 0.09
Chromium (dissolved) Chromium (hexavalent)	P9/1	5	ISO 17025	< 0.00	< 0.00	< 0.00	< 0.00	< 0.00
Chromium (dissolved)	P9/1	0.4	ISO 17025	15	< 5.0 1 2	16	< 0.0 0.0	> 0.0> 2.0
Conner (discolved)	10/I	0.7	ISO 17025	21	8.7	10	0.0 21	2.3
Lead (dissolved)	ug/l	1	ISO 17025	3.8	44	27	4.7	4.4
Mercury (dissolved)	ug/l	0.5	ISO 17025	< 0.5	< 0.5	< 05	< 0.5	
Nickel (dissolved)	µg/. µg/l	0.3	ISO 17025	44	46	4	61	ς υ.J
Selenium (dissolved)	ug/l	4	ISO 17025	< 4.0	< 4 0	5.6	93	< 4 0
Zinc (dissolved)	μg/l	0.4	ISO 17025	15	10	8.6	15	12
				15	10	0.0	1 15	14
Monoaromatics & Oxygenates	110/1	1	ISO 17025	. 1 0	. 1.0	. 1.0	. 1 0	. 1.0
benzene	µg/1	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tuluene Ethylhonzono	µg/i	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	µg/1	1	ISO 17025	< 1.0	< 1.U	< 1.0	< 1.0	< 1.U
	P9/1	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 1.0	< 10	< 10	< 1.0
THE (HEATY TELUCITY DULYI LUICI)	-5/.		1	< 10	< 10	< 10	< 10	< 10





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11

Your Order No: P4397JJ2609.14								
Lab Sample Number				2433440	2433441	2433442	2433443	2433444
Sample Reference				WS1	WS6	WS8	BH5	TP1
Sample Number				None Supplied				
Depth (m)				0.10	0.50	0.50	0.30	0.40
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
	1	5		None Supplied				
		init	Ao					
Analytical Parameter	ç	9,	Sta					
(Leachate Analysis)	nits	det	lita					
		et.	tion					
		on	-					
Petroleum Hydrocarbons								
TPH1 (C10 - C40) EH_1D_TOTAL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH2 (C6 - C10) HS_1D_TOTAL	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
-								
TPH C6 - C40 EH+HS_1D_TOTAL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C5 - C6 HS 1D AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 HS 1D AI	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 HS 1D AL	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic > C10 - C12 \approx 10 Al \approx MC	µq/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 r_{1} + r_{2} + r_{3}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic $>$ C16 - C21 m rate of a rate of a	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic $>C21 - C35$	ug/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) up to the to the	ug/l	10	NONE	< 10	< 10	< 10	< 10	< 10
HIP HERE (CD CDD) HS+EH_ID_AL_#1_#2_MS	1.57			< 10	< 10	< 10	< 10	< 10
TDH OMC Aromatics CE CZ	ug/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Alomatic > $C3 - C7_{HS_{1D}_{AR}}$	µg/1	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 _{HS_1D_AR}	μ9/1	1	150 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - $C10_{HS_1D_{AR}}$	µg/i	1	150 1/025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 _{EH_1D_AR_#1_#2_MS}	µg/I	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 _{EH_1D_AR_#1_#2_MS}	µg/I	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 $_{EH_{1D}AR_{\#1}\#2MS}$	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 _{EH_1D_AR_#1_#2_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) $_{HS+EH_1D_AR_\#1_\#2_MS}$	µg/i	10	NONE	< 10	< 10	< 10	< 10	< 10
					1			
TPH (C6 - C10) HS_1D_TOTAL	mg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
TPH (C10 - C12) _{EH_1D_TOTAL_#1_#2_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH (C12 - C16) EH_1D_TOTAL_#1_#2_MS	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH (C16 - C21) _{EH_1D_TOTAL_#1_#2_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH (C21 - C40) _{EH_1D_TOTAL_#1_#2_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
VOCs								
Chloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	μg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	μα/Ι	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1 2-dichloropropape	μα/I	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µa/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µa/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	10/	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
bromodichioromethane	P9/1	-		< 1.0	< 1.0	< 1.U	< 1.0	~ 1.0





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11

Your Order	No: P4397JJ2609.14	

Lab Sample Number	2433440	2433441	2433442	2433443	2433444			
Sample Reference				WS1	WS6	WS8	BH5	TP1
Sample Number				None Supplied				
Depth (m)				0.10	0.50	0.50	0.30	0.40
Date Sampled				21/09/2022	21/09/2022	21/09/2022	21/09/2022	21/09/2022
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					
Cis-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
n-Propylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
ter-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
P-Isopropyltoluene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0





Analytical Report Number : 22-85708 Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2433418	WS1	None Supplied	0.1	Brown loam and clay with gravel and vegetation.
2433419	WS2	None Supplied	0.1	Brown clay and sand with gravel and vegetation.
2433420	WS3	None Supplied	0.1	Brown clay and loam with vegetation.
2433421	WS4	None Supplied	0.1	Brown clay and sand with gravel and vegetation.
2433422	WS5	None Supplied	0.1	Brown clay and loam with gravel and vegetation.
2433423	WS6	None Supplied	0.1	Brown clay and sand with gravel and vegetation.
2433424	WS7	None Supplied	0.25	Brown clay and sand with gravel and vegetation.
2433425	WS8	None Supplied	0.1	Brown loam with gravel and vegetation.
2433426	WS8	None Supplied	0.5	Brown sand with vegetation and stones.
2433428	BH1	None Supplied	0.5	Brown clay and sand with gravel and vegetation.
2433429	BH2	None Supplied	0.3	Brown clay and sand with gravel and vegetation.
2433430	TP2	None Supplied	0.5	Brown clay and sand with gravel.
2433431	TP3	None Supplied	0.4	Brown clay and sand with gravel.
2433432	TP4	None Supplied	0.4	Brown clay and sand with gravel.
2433433	TP5	None Supplied	0.4	Brown sandy clay with gravel and vegetation.
2433434	TP6	None Supplied	0.5	Brown sandy clay with gravel and vegetation.
2433435	TP7	None Supplied	0.5	Brown sandy clay with gravel and vegetation.
2433436	TP9	None Supplied	0.5	Brown sandy clay with gravel and vegetation.
2433437	TP10	None Supplied	0.5	Brown sandy clay with gravel and vegetation.
2433438	TP11	None Supplied	0.8	Brown clay and sand with gravel and vegetation.
2433439	TP12	None Supplied	0.3	Brown sand with gravel and vegetation.





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	w	ISO 17025
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	w	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	w	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	w	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	w	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	w	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in leachate (automated)	Determination of pH in leachate by electrometric measurement.	In house method.	L099B	w	ISO 17025
PRO (Soil)	Determination of hydrocarbons C6-C10 by headspace GC MS.	In-house method based on USEPA8260	L088-PL	w	MCERTS
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	w	ISO 17025





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
TPH1 (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPH2 (Leachates)	Determination of hydrocarbons C6-C10 by headspace GC MS.	In-house method based on USEPA8260	L088-PL	W	NONE
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	ISO 17025
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	w	MCERTS
Volatile organic compounds in leachate	Determination of volatile organic compounds in leachate by headspace GC-MS	In-house method based on USEPA8260	L073B-PL	w	ISO 17025
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	w	MCERTS
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
TPH in (Leachate)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method, TPH with carbon banding.	L070-PL	w	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Coal Tar in Soil	DCM Extraction with qualitative interpretation via GC/MS	In-house method	L064-PL	D	NONE
TPH C6 - C40 (leachate)	Determination of TPH in leachate by HS-GC-MS and GC-MS	In-house method	L070-PL	w	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	w	MCERTS





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom. For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total





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e: Jomas Associates -

Analytical Report Number : 22-86273

Project / Site name:	Zone 5 and ESA Harwell Campus, Didcot OX11	Samples received on:	20/09/2022
Your job number:	JJ2609	Samples instructed on/ Analysis started on:	26/09/2022
Your order number:	P4397JJ2609.16	Analysis completed by:	03/10/2022
Report Issue Number:	1	Report issued on:	03/10/2022
Samples Analysed:	13 soil samples		

Nonja Signed:

Dominika Warjan Junior Reporting Specialist For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland. Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.





Project / Site name: Zone 5 and ESA Harwell Campus, Didcot OX11 Your Order No: P4397JJ2609.16

Lab Sample Number				2437112	2437113	2437114	2437115	2437116
Sample Reference				WS3	WS3	WS4	WS5	WS7
Sample Number				None Supplied				
Depth (m)	0.50	2.00	0.50	0.60	1.00			
Date Sampled	Deviating	Deviating	Deviating	Deviating	Deviating			
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	53	< 0.1	33	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	5.9	14	6.5	7.9	17
Total mass of sample received	kg	0.001	NONE	1	0.6	1	1	1.5

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9	8.9	7.9	8.7	8.8
Total Sulphate as SO4	mg/kg	50	MCERTS	270	460	120	410	570
Total Sulphate as SO4	%	0.005	MCERTS	0.027	0.046	0.012	0.041	0.057
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0034	< 0.0013	0.0055	0.0014	0.0022
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	3.4	< 1.3	5.5	1.4	2.2
Total Sulphur	mg/kg	50	MCERTS	140	170	66	170	240
Total Sulphur	%	0.005	MCERTS	0.014	0.017	0.007	0.017	0.024





Project / Site name: Zone 5 and ESA Harwell Campus, Didcot OX11 Your Order No: P4397JJ2609.16

Lab Sample Number				2437117	2437118	2437119	2437120	2437121
Sample Reference				WS7	BH1	BH1	BH2	BH2
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied			
Depth (m)	2.00	0.60	2.00	1.00	3.00			
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	17	18	18	19
Total mass of sample received	kg	0.001	NONE	0.9	0.6	0.6	0.6	0.6

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.1	8.8	8.8	9	8.3
Total Sulphate as SO4	mg/kg	50	MCERTS	470	440	470	360	430
Total Sulphate as SO4	%	0.005	MCERTS	0.047	0.044	0.047	0.036	0.043
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0016	0.0034	0.0088	0.0058	0.0067
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	1.6	3.4	8.8	5.8	6.7
Total Sulphur	mg/kg	50	MCERTS	180	190	230	190	230
Total Sulphur	%	0.005	MCERTS	0.018	0.019	0.023	0.019	0.023





Project / Site name: Zone 5 and ESA Harwell Campus, Didcot OX11 Your Order No: P4397JJ2609.16

Lab Sample Number				2437122	2437123	2437124
Sample Reference				BH3	BH3	BH5
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.20	4.00	3.00
Date Sampled				Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	14	18	18
Total mass of sample received	kg	0.001	NONE	0.6	0.6	0.6

General Inorganics

pH - Automated	nH Units	N/A	MCERTS	8	0	86
pri Adomated	pri onico		11021110	0	,	0.0
Total Sulphate as SO4	mg/kg	50	MCERTS	590	470	520
Total Sulphate as SO4	%	0.005	MCERTS	0.059	0.047	0.052
Water Soluble SO4 16hr extraction (2:1 Leachate						
Equivalent)	g/l	0.00125	MCERTS	0.0068	0.0031	0.0044
Water Soluble SO4 16hr extraction (2:1 Leachate						
Equivalent)	mg/l	1.25	MCERTS	6.8	3.1	4.4
Total Sulphur	mg/kg	50	MCERTS	390	190	210
Total Sulphur	%	0.005	MCERTS	0.039	0.019	0.021





Analytical Report Number : 22-86273 Project / Site name: Zone 5 and ESA Harwell Campus, Didcot OX11

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2437112	WS3	None Supplied	0.5	Brown clay and sand with stones and gravel
2437113	WS3	None Supplied	2	Brown clay and sand with gravel.
2437114	WS4	None Supplied	0.5	Brown clay and sand with stones and gravel
2437115	WS5	None Supplied	0.6	Brown clay and sand with gravel.
2437116	WS7	None Supplied	1	Brown clay and sand with gravel.
2437117	WS7	None Supplied	2	Brown clay and sand with gravel.
2437118	BH1	None Supplied	0.6	Brown clay and sand with gravel.
2437119	BH1	None Supplied	2	Brown clay and sand with gravel.
2437120	BH2	None Supplied	1	Brown clay and sand with gravel.
2437121	BH2	None Supplied	3	Brown clay and sand with gravel.
2437122	BH3	None Supplied	0.2	Brown clay and loam with gravel and vegetation.
2437123	BH3	None Supplied	4	Brown clay and sand with gravel.
2437124	BH5	None Supplied	3	Brown clay and sand with gravel.





Project / Site name: Zone 5 and ESA Harwell Campus, Didcot OX11

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	w	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP- OES.	In house method.	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCI followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP- OES.	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland. Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.



Analytical Report Number : 22-86273 Project / Site name: Zone 5 and ESA Harwell Campus, Didcot OX11

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1	None Supplied	S	2437118	а	None Supplied	None Supplied	None Supplied
BH1	None Supplied	S	2437119	а	None Supplied	None Supplied	None Supplied
BH2	None Supplied	S	2437120	а	None Supplied	None Supplied	None Supplied
BH2	None Supplied	S	2437121	а	None Supplied	None Supplied	None Supplied
BH3	None Supplied	S	2437122	а	None Supplied	None Supplied	None Supplied
BH3	None Supplied	S	2437123	а	None Supplied	None Supplied	None Supplied
BH5	None Supplied	S	2437124	а	None Supplied	None Supplied	None Supplied
WS3	None Supplied	S	2437112	а	None Supplied	None Supplied	None Supplied
WS3	None Supplied	S	2437113	а	None Supplied	None Supplied	None Supplied
WS4	None Supplied	S	2437114	а	None Supplied	None Supplied	None Supplied
WS5	None Supplied	S	2437115	а	None Supplied	None Supplied	None Supplied
WS7	None Supplied	S	2437116	а	None Supplied	None Supplied	None Supplied
WS7	None Supplied	S	2437117	а	None Supplied	None Supplied	None Supplied





Shaw Carter Jomas Associates Ltd Lakeside House 1 Furzeground Way Stockley Park UB11 1BD

i2 Analytical Ltd. 7 Woodshots Meadow, Croxley Green Business Park, Watford, Herts, WD18 8YS

- t: 01923 225404
- f: 01923 237404
- e: reception@i2analytical.com

e: Jomas Associates -

Analytical Report Number : 22-85715

Project / Site name:	Zone 5 and ESA Harwell campus, Didcot OX11	Samples received on:	20/09/2022
Your job number:	JJ2609	Samples instructed on/ Analysis started on:	22/09/2022
Your order number:	P4397JJ2609.14	Analysis completed by:	03/10/2022
Report Issue Number:	1	Report issued on:	03/10/2022
Samples Analysed:	4 10:1 WAC Samples		

Jam Signed:

asbestos - 6 months from reporting

Adam Fenwick Technical Reviewer For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland. Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation. Standard sample disposal times, unless otherwise agreed with the laboratory, are : soils - 4 weeks from reporting leachates - 2 weeks from reporting waters - 2 weeks from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.





7 Woodshots Meadow Croxley Green Business Park Watford, WD18 8YS Telephone: 01923 225404 Fax: 01923 237404 email:reception@i2analytical.com

Location Location Lab Reference (Sample Number) Sampling Date Sample ID Depth (m) Solid Waste Analysis TOC (%)** Solid Waste Analysis Solid Waste A	Zone 5	and ESA Harwell car 2433479 / 243 21/09/202 WS1 0.50	npus, Didcot OX11	Client:	JOMASASSO	C
Location Location Lab Reference (Sample Number) Sampling Date Sample ID Depth (m) Solid Waste Analysis FOC (%)** Solid Waste Analysis BS EN 12457 - 2 preparation utilising end over end leaching wrocedure) Varenic * Sample ID Solid Waste Analysis Solid Waste Mathematical Waste	Zone 5	and ESA Harwell car 2433479 / 243 21/09/202: WS1 0.50	npus, Didcot OX11 3480	Client:	JOMASASSO	C
Location Lab Reference (Sample Number) Sampling Date Sample ID Depth (m) Solid Waste Analysis FOC (%)** oss on Ignition (%) ** Mineral Oil (mg/kg) ** Mineral Oil (mg/kg) ** Solid Waste Analysis FOC (%)** Solid Waste Analysis BTEX (µg/kg) ** Mineral Oil (mg/kg) H_11D_CU,AL Fotal PAH (WAC-17) (mg/kg) With Varialisation Capacity (mmol / kg) Eluate Analysis BS EN 12457 - 2 preparation utilising end over end leaching procedure) vsenic * Sarium *	Zone 5	and ESA Harwell car 2433479 / 243 21/09/202 WS1 0.50	npus, Didcot OX11 3480	Client: Landfill	JOMASASSO	C
Location Lab Reference (Sample Number) Sampling Date Sample ID Depth (m) Solid Waste Analysis TOC (%)** .oss on Ignition (%) ** 3TEX (µg/kg) ** Jum of PCBs (mg/kg) **. Jum of PCBs (mg/kg) **. Vineral Oil (mg/kg) 6H.10.CU.AL Total PAH (WAC-12) (mg/kg) H (units)**. Axid Neutralisation Capacity (mmol / kg) Eluate Analysis BS EN 12457 - 2 preparation utilising end over end leaching rocedure) visenic * arium *	Zone 5	and ESA Harwell car 2433479 / 243 21/09/202: WS1 0.50	mpus, Didcot OX11 3480	Landfill		
Location Lab Reference (Sample Number) Sampling Date Sample ID Depth (m) Cold Waste Analysis COC (%)** Sold Waste Analysis COC (%)** Sold Waste Analysis COC (%)** StrEX (µg/kg) ** StrEX (µg/kg	Zone 3	2433479 / 243 21/09/2022 WS1 0.50	3480	Landfill		
Lab Reference (Sample Number) Sampling Date Sample ID Depth (m) Solid Waste Analysis TCC (%)** oss on Ignition (%) ** Streps (µg/kg) ** TEX (µg/kg) ** Goal PAH (WAC-17) (mg/kg) H (units)** Siluate Analysis BS EN 12457 - 2 preparation utilising end over end leaching rocedure) resenic * arium *		2433479 / 243 21/09/202 WS1 0.50	3480	Lanumi	Waste Accentan	co Critoria
Sampling Date Sample ID Depth (m) Solid Waste Analysis 'OC (%)** TEX (µJ/R) ** ison of PCBs (mg/kg) ** ison of PCBs (mg/kg) ** ifteral Oil (mg/kg) ** ifteral Oil (mg/kg) ** 'otal PAH (WAC-17) (mg/kg) H (units)** icki Neutralisation Capacity (mmol / kg) Eluate Analysis BS EN 12457 - 2 preparation utilising end over end leaching irocedure) vrsenic * arium *		21/09/2023 WS1 0.50	2433479 / 2433480			e cinteria
Sample ID Depth (m) iolid Waste Analysis OC (%)** oss on Ignition (%) ** TEX (ug/kg) ** timeral Oli (mg/kg) ** interal Oli (mg/kg) ** otal PAH (WAC-17) (mg/kg) H (units)** cid Neuralisation Capacity (mmol / kg) situate Analysis BS EN 12457 - 2 preparation utilising end over end leaching rocedure) rsrenic * arium *		WS1 0.50	2		Stable Non-	
Depth (m) Solid Waste Analysis COC (%)** oss on Ignition (%) ** STEX (µg/kg) ** uimeral Oli (mg/kg) ** Mineral Oli (mg/kg) ** fotal PAH (WAC-17) (mg/kg) H4 (uits)** kcid Neutralisation Capacity (mmol / kg) Eluate Analysis BS EN 12457 - 2 preparation utilising end over end leaching mocedure) vsenic * anium *				- 	reactive	
iolid Waste Analysis				Landfill	hazardous Landfill	Waste Landfill
rOC (%)**						
.oss on Ignition (%) **	1.8			3%	5%	6%
3TEX (µg/kg) **	4.2					10%
Sum of PCBs (mg/kg) ** wineral Oil (mg/kg) _{EH 1D CU AL} Total PAH (WAC-17) (mg/kg) pH (units)** Acid Neutralisation Capacity (mmol / kg) State Analysis BS EN 12457 - 2 preparation utilising end over end leaching roccedure) rsenic * arium *	< 10			6000		
Total PAH (WAC-17) (mg/kg) EH. 10. CU, AL Total PAH (WAC-17) (mg/kg) H (units)** Kid Neutralisation Capacity (mmol / kg) Eluate Analysis BS EN 12457 - 2 preparation utilising end over end leaching rocedure) rscenic * arium *	< 0.007			1		
Irdal PAH (WAC-1/) (mg/kg) IH (units)** kcid Neutralisation Capacity (mmol / kg) Iluate Analysis BS EN 12457 - 2 preparation utilising end over end leaching procedure) resenic * arium *	< 10			500		
Acid Neutralisation Capacity (mmol / kg) Eluate Analysis BS EN 12457 - 2 preparation utilising end over end leaching procedure) rsenic * arium *	7.32			100		
Acid Neutralisation Capacity (mmol / kg) Eluate Analysis BS EN 12457 - 2 preparation utilising end over end leaching procedure) resenic * arium *	8.1				>6	
Eluate Analysis BS EN 12457 - 2 preparation utilising end over end leaching rocedure) resenic * Jarium *	3.8				To be evaluated	To be evaluated
BS EN 12457 - 2 preparation utilising end over end leaching vrocedure) vrsenic *	10:1		10:1	Limit value	es for compliance le	eaching test
bs EN 12457 - 2 preparation utilising end over end leacning procedure) Serice * Sarium *				using BS EN	12457-2 at L/S 10) l/kg (mg/kg)
Arsenic * Barium *	mg/l		mg/kg	-		
Barium *	+ 0.0010		10.0100	0.5	2	25
banum	< 0.0010		< 0.0100	0.5	100	25
admium *	< 0.0003		< 0.008	0.04	100	500
Chromium *	0.0015		0.013	0.04	10	70
Conner *	0.015		0.14	2	50	100
Mercurv *	0.0009		0.0079	0.01	0.2	2
Molvbdenum *	0.0010		0.0086	0.5	10	30
vickel *	0.0043		0.039	0.4	10	40
ead *	0.0045		0.040	0.5	10	50
Antimony *	< 0.0017		< 0.017	0.06	0.7	5
Selenium *	< 0.0040		< 0.040	0.1	0.5	7
linc *	0.012		0.11	4	50	200
Chloride *	0.89		8.0	800	15000	25000
Fluoride	1.0		8.9	10	150	500
Sulphate *	1.0		9.3	1000	20000	50000
IDS*	60		540	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010		< 0.10	1	-	-
boc	10.8		96.8	500	800	1000
each Test Information				1		
Stone Content (%)	< 0.1					
Sample Mass (kg)	1.0					
Dry Matter (%)	91					
Noisture (%)	9.2					
						1
esults are expressed on a dry weight basis, after correction for moisture						

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.





7 Woodshots Meadow Croxley Green Business Park Watford, WD18 8YS Telephone: 01923 225404 Fax: 01923 237404 email:reception@i2analytical.com

ABOUT NO:		22	-85715				
			00720				
					Client:	JOMASASSO	С
					-		
Location	Zone	5 and ESA Harv	vell campus, Did	COT UX11	Landfill	Waste Accentan	o Critoria
Lab Reference (Sample Number)		243348	31 / 2433482		Lanumi	Limits	e cinteria
Sampling Date		21/	09/2022			Stable Non-	
Sample ID		W	S3 0.10		T	reactive	
Depth (m)					Inert Waste Landfill	HAZARDOUS waste in non- hazardous Landfill	Waste Landfill
olid Waste Analysis							
OC (%)**	3.9				3%	5%	6%
oss on Ignition (%) **	8.5						10%
TEX (μg/kg) **	< 10		_		6000		
um of PCBs (mg/kg) **	< 0.007				1		
Interal Oil (mg/kg) EH_1D_CU_AL	< 10				500		
Oldi PAR (WAC-17) (Mg/kg)	3.00	-	-	-	100		
	7.8				-	>0	
cid Neutralisation Capacity (mmol / kg)	3.3					To be evaluated	To be evaluated
luate Analysis	10:1			10:1	Limit value	es for compliance le	eaching test
PC EN 134E7 2 proparation utilizing and over and leaching			_		using BS EN	12457-2 at L/S 10	l/kg (mg/kg)
ss EN 12457 - 2 preparation utilising end over end leaching rocedure)	mg/l			mg/kg	-		
	0.0042			0.0256	0.5	2	25
rsenic *	0.0042			0.0356	0.5	2	25
anun *	< 0.00143		-	< 0.0008	20	100	500
ibromium *	0.0001			0.011	0.04	10	70
ionner *	0.041		-	0.35	2	50	100
1ercurv *	< 0.0005			< 0.0050	0.01	0.2	2
10lybdenum *	0.0011			0.0095	0.5	10	30
lickel *	0.0054			0.045	0.4	10	40
ead *	0.0041			0.034	0.5	10	50
ntimony *	< 0.0017			< 0.017	0.06	0.7	5
elenium *	< 0.0040			< 0.040	0.1	0.5	7
inc *	0.011			0.093	4	50	200
hloride *	1.6			14	800	15000	25000
luoride	0.13			1.1	10	150	500
ulphate *	2.0			17	1000	20000	50000
DS*	100			880	4000	60000	100000
henol Index (Monohydric Phenols) *	< 0.010	-	-	< 0.10	1	-	-
юс	23.6			200	500	800	1000
each Test Information							
tone Content (%)	< 0.1						
ample Mass (kg)	1.0						
ry Matter (%)	91						
loisture (%)	8.7						
	ļ				ļ		
	<u> </u>	I	_		<u> </u>	L	
esults are expressed on a dry weight basis, after correction for m	pisture content whe	re applicable.			*= UKAS accredit	ed (liquid eluate and	alysis only)

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.





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Report No:		22	-85715				
			00720				
					Client:	JOMASASSO	С
	7				-		
Location	Zone	5 and ESA Harv	vell campus, Did	cot 0X11	Landfill	Wasta Ascontan	o Critoria
Lab Reference (Sample Number)		243348	3 / 2433484		Landfill Waste Acceptance Criteria		
Sampling Date		21/	09/2022			Stable Non-	
Sample ID		BH	13 0.60		To and Marchae	reactive	
Depth (m)					Landfill	HAZARDOUS waste in non- hazardous Landfill	Waste Landfill
Solid Waste Analysis							
FOC (%)**	0.2				3%	5%	6%
.oss on Ignition (%) **	2.0						10%
3TEX (μg/kg) **	< 10				6000		
Sum of PCBs (mg/kg) **	< 0.007				1		
fineral Oil (mg/kg) _{EH_1D_CU_AL}	< 10				500		
otal PAH (WAC-17) (mg/kg)	< 0.85				100		
n (units)***	8.0		-	-		>0	
acid Neutralisation Capacity (mmol / kg)	1.6					To be evaluated	To be evaluated
Eluate Analysis	10.1			10.1	Limit value	es for compliance le	eaching test
	1011			1011	using BS FN	12457-2 at 1/S 10	l/ka (ma/ka)
BS EN 12457 - 2 preparation utilising end over end leaching	ma/l			ma/ka	doing bo En	1210/2020/010	· , ··g (···g, ··g)
Jocedure)						I	1
Arsenic *	0.0022			0.0188	0.5	2	25
Barium *	0.0072		-	0.0617	20	100	300
Ladmium *	< 0.0001			< 0.0008	0.04	1	5
	0.0012			0.011	0.5	10	70
Jopper *	< 0.0072		-	0.062	2	50	100
Molybdenum *	0.0003			0.0030	0.01	10	30
Nickel *	0.0010			0.031	0.5	10	40
ead *	0.0024			0.020	0.5	10	50
Antimony *	< 0.0017			< 0.017	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.0088			0.075	4	50	200
Chloride *	0.78			6.6	800	15000	25000
Fluoride	0.56			4.8	10	150	500
Sulphate *	0.81			7.0	1000	20000	50000
rds*	55			470	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
JOC	6.47			55.3	500	800	1000
each Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.60						
Dry Matter (%)	82		_				
Aoisture (%)	18			+		1	
				+		1	
			+	-			
aguite are everygood on a dry weight basis after competing for mo	atura contont ····			-	*- 11KAC por-	od (liquid aluata and	husis only)
and any any any meight basis after correction for mo-	scure content whe	i e applicable.			UKAS accredit	.eu (iiquia eluate ana	нуыз опну)

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.





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Location Zone 5 and ESA Harwell campus, Didoct 0X11 Client: JOMASASSOC Location Zone 5 and ESA Harwell campus, Didoct 0X11 Landfill Waste Acceptance Criteria Banghing Date 21/09/2021 Landfill Waste Acceptance Criteria Landfill Waste Acceptance Criteria Depth (m) TH 0.40 The 0.40 Inter Waste MacAccuse - Waste MacAcuse - Waste MacAccuse - Waste MacAcuse - Waste MacAccuse - Waste MacAccuse - Waste MacAccuse - Wast	Report No:	Results	22-	85715		1			
LocationZone 3 web 25A Harvell comput, Didox DX1Client: Client: DMASASSOCLbb Reference (Sample Number)Zd3485 / 243346Sample IDSample ID									
Location Zone 5 and ESA Harvell campus, Didcot XXI Lob Reference (Sample Number) Za13485 / Za13486 Landfill Waste Acceptance Criteria Sample ID Sampling Date Z1/09/2022 Image: Sample Number) Number						0 11	1011101000		
Loation Zone S and ESA Harwell campus, Didoct X11 Lab Reference (Sample Number) 2/23/3466/ Lab Reference (Sample Number) Lab Reference (Sample Number) Sample D 2/10/0 Z/2 Inst Water Lab Reference (Sample Number) Jame Reference (Sample Number) <th></th> <th></th> <th></th> <th></th> <th></th> <th>Client:</th> <th>JOMASASSO</th> <th>C</th>						Client:	JOMASASSO	C	
Lab defenence (Sample Number)L434485 / 243466 / LAIGHI W=ZE AUGN 2022Sample IDZ109/2022Sample IDSample IDS	Location	Zone !	5 and ESA Harw	ell campus, Didc	ot OX11				
Sampling Date 1000000000000000000000000000000000000	Lab Reference (Sample Number)		243348	5 / 2433486		Landfill Waste Acceptance Criteria			
Joint Part Part Part Part Part Part Part Par	Compling Data		2433403	0/2433400			Limits Stable Non-		
Depth (m) Inter Waste Inter Waste HeadWork HeadWork HeadWork Waste is and the waste in non-sharing waste waste in non-sharing waste waste in non-sharing wast	Sampling Date		21/C	4 0.40			reactive		
bid Wate Analysis OC (%)** OC (%) OC	Depth (m)					Inert Waste Landfill	HAZARDOUS waste in non- hazardous Landfill	Hazardous Waste Landfill	
CDC (%)** O.5 3% 5% 6% Sos In Junitor (%) ** 2.7 - - - 10% STEX (Lipk) ** < 0.00	Solid Waste Analysis								
disc on fightion (%) ** 2.7 10 sum of PDS (mg/kg) ** < 0.007	FOC (%)**	0.5				3%	5%	6%	
If b: (up/g) ** <	.oss on Ignition (%) **	2.7						10%	
Jum of PLAS (mg/kg) ** < 1	3TEX (µg/kg) **	< 10				6000			
Minifer AD (mg/Ag) per to Co.Ac. < 10 S00	Sum of PCBs (mg/kg) **	< 0.007				1			
Ideal PAR (VAC-17) (mg/g) < Ideal PAR (VAC-17) (mg/g)	filteral Oil (filg/kg) _{EH_1D_CU_AL}	< 10				500			
Pri (URIS)** 7.9 - - >>6 >>6 >>6 ><6 ><6 ><6 ><6 ><6 ><6 ><6 ><6 No <	Jotal PAH (WAC-1/) (mg/kg)	< 0.85				100			
Acid Neutralisation Capacity (mmol / kg) 1.2 To be evaluated To be eval	oH (units)**	7.9					>6		
Bit Analysis 10:1	Acid Neutralisation Capacity (mmol / kg)	1.2					To be evaluated	To be evaluated	
BS EN 12457 - 2 preparation utilising end over end leaching morecedure) mg/l mg/kg wsenic * 0.0014 0.0126 0.5 2 25 sartum * 0.0074 0.0653 20 100 300 admium * - 0.0011 <	luate Analysis	10:1			10:1	Limit value	es for compliance le	eaching test	
vsenic* 0.0014 0.0126 0.5 2 25 barlum * 0.0074 0.0653 20 100 300 cardinium * 0.0019 0.0008 20 10 300 Chromium * 0.0019 0.017 0.5 10 70 Sopper * 0.018 0.016 2 50 100 forcury * < 0.0004	BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN	1 12457-2 at L/S 10	i l/kg (mg/kg)	
lanum * 0.0074 0.0683 2.0 1.00 300 admium * < 0.001	vrsenic *	0.0014			0.0126	0.5	2	25	
admium* < 0.0001	Barium *	0.0074			0.0653	20	100	300	
Dromium * 0.0019 0.017 0.5 10 70 Copper * 0.018 0.016 2 50 100 Copper * 0.005 <.0.0050	Cadmium *	< 0.0001			< 0.0008	0.04	1	5	
Copper * 0.018 0.16 2 50 100 Vercury * < 0.0005	Chromium *	0.0019			0.017	0.5	10	70	
dercury* < 0.0005 < 0.0050 0.01 0.2 2 dolydonum * < 0.0040	Copper *	0.018			0.16	2	50	100	
40\pdehum * < 0.0004 < 0.0060 0.5 10 30 sitcle * 0.0065 0.057 0.4 10 40 ead * 0.0051 0.045 0.5 10 50 hummony * < 0.0017	Aercury *	< 0.0005			< 0.0050	0.01	0.2	2	
wickel* 0.0065 0.057 0.4 10 40 ead * 0.0051 0.045 0.5 10 50 selenium * < 0.0017	1olybdenum *	< 0.0004			< 0.0040	0.5	10	30	
ead * 0.0051 0.045 0.5 10 50 hutimony * < 0.0017	Nickel *	0.0065			0.057	0.4	10	40	
Initimory * < 0.0017	ead *	0.0051			0.045	0.5	10	50	
selenium * < 0.040	Antimony *	< 0.0017			< 0.017	0.06	0.7	5	
Inc * 0.014 0.12 4 50 200 Chloride * 0.64 5.7 800 1500 2500 Suphate * 0.78 7.2 10 150 500 Suphate * 0.78 6.9 1000 2000 500 TDS* 57 500 4000 60000 10000 Phone Index (Monohydric Phenols) * < 0.010	Selenium *	< 0.0040			< 0.040	0.1	0.5	7	
Chloride * 0.64 5.7 800 1500 2500 Buoide 0.82 7.2 10 150 500 Subplate * 0.78 6.9 1000 20000 5000 TDS* 57 500 4000 60000 10000 Phenol Index (Monohydric Phenols) * < 0.010	Zinc *	0.014			0.12	4	50	200	
Huoride 0.82 7.2 10 150 500 Sidphate * 0.78 6.9 10000 20000 500 DDS* 57 500 4000 60000 10000 Phenol Index (Monohydric Phenols) * < 0.010	Chloride *	0.64			5.7	800	15000	25000	
Sulphate * 0.78 6.9 1000 20000 5000 TDS* 57 500 4000 60000 10000 Phenol Index (Monohydric Phenols) * < 0.010	Fluoride	0.82			7.2	10	150	500	
DS* 57 500 4000 60000 10000 Phenol Index (Monohydric Phenols) * < 0.010	Sulphate *	0.78			6.9	1000	20000	50000	
henol Index (Monohydric Phenols)* < 0.00 1 - - DOC 10.2 89.6 500 800 1000 Leach Test Information Image: Construction of the second	DS*	57			500	4000	60000	100000	
DC DC <thdc< th=""> DC DC DC<!--</td--><td>henol Index (Monohydric Phenols) *</td><td>< 0.010</td><td></td><td></td><td>< 0.10</td><td>500</td><td>- 800</td><td>-</td></thdc<>	henol Index (Monohydric Phenols) *	< 0.010			< 0.10	500	- 800	-	
.each Test Information		10.2			05.0	500	000	1000	
Center rest information Content (%) < 0.1 Content (%) < 0.1 Content (%) < 0.1 Content (%) Content (%) <th< td=""><td>each Tect Information</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	each Tect Information								
itone Content (%) < 0.1									
iample Mass (kg) 1.0 Image: Constraint of the second seco	itone Content (%)	< 0.1							
Iny Matter (%) 88 Image: mail of the second	Sample Mass (kg)	1.0							
Moisture (%) 12 Image: Constraint of the second se	Dry Matter (%)	88							
Results are expressed on a dry weight basis, after correction for moisture content where applicable.	loisture (%)	12							
esults are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (linuid eluate analysis only)									
esults are expressed on a dry weight basis, after correction for moisture content where applicable. *= LIKAS accredited (liquid eluate analysis only)									
	esults are expressed on a dry weight basis, after correction for mo	isture content whe	re applicable.			*= UKAS accredit	ed (liquid eluate ana	alysis only)	

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3. This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.





Analytical Report Number : 22-85715 Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2433479	WS1	0.5	None Supplied	Brown clay and loam with gravel and vegetation.
2433481	WS3	0.1	None Supplied	Brown clay and loam with vegetation.
2433483	BH3	0.6	None Supplied	Brown clay and sand with gravel and vegetation.
2433485	TP4	0.4	None Supplied	Brown clay and sand with gravel.





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	w	NONE
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	w	MCERTS
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073-PL	W	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	w	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	w	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	w	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by EC probe using a factor of 0.6.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031	W	ISO 17025





Project / Site name: Zone 5 and ESA Harwell campus, Didcot OX11

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom. For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total





Shaw Carter Jomas Associates Ltd Lakeside House 1 Furzeground Way Stockley Park UB11 1BD

i2 Analytical Ltd. 7 Woodshots Meadow, Croxley Green Business Park, Watford, Herts, WD18 8YS

- t: 01923 225404
- **f:** 01923 237404
- e: reception@i2analytical.com

e: Jomas Associates -

Analytical Report Number : 22-86914

Project / Site name:	Zone 5 & ESA Harwell Campus, Didcot OX11	Samples received on:	20/09/2022
Your job number:	332609	Samples instructed on/ Analysis started on:	26/09/2022
Your order number:	P4397JJ2609.16	Analysis completed by:	04/10/2022
Report Issue Number:	1	Report issued on:	04/10/2022
Samples Analysed:	2 soil samples		

Nonja Signed:

Dominika Warjan Junior Reporting Specialist For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland. Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.





Project / Site name: Zone 5 & ESA Harwell Campus, Didcot OX11 Your Order No: P4397JJ2609.16

Lab Camula Number				2441120	2441121
Lad Sample Number		2441120	2441121		
Sample Reference				BH1	BH5
Sample Number				None Supplied	None Supplied
Depth (m)				6.00	0.40-0.80
Date Sampled				Deviating	Deviating
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	18	12
Total mass of sample received	kg	0.001	NONE	1.1	1.1

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.8	8.1
Total Sulphate as SO4	mg/kg	50	MCERTS	650	710
Total Sulphate as SO4	%	0.005	MCERTS	0.065	0.071
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.004	0.0067
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	4	6.7
Total Sulphur	mg/kg	50	MCERTS	250	360
Total Sulphur	%	0.005	MCERTS	0.025	0.036





Analytical Report Number : 22-86914 Project / Site name: Zone 5 & ESA Harwell Campus, Didcot OX11

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2441120	BH1	None Supplied	6	Brown clay and sand with gravel and vegetation.
2441121	BH5	None Supplied	0.40-0.80	Brown clay and sand with gravel and vegetation.





Project / Site name: Zone 5 & ESA Harwell Campus, Didcot OX11

Water matrix abbreviations:

Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	w	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP- OES.	In house method.	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP- OES.	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland. Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report



Analytical Report Number : 22-86914 Project / Site name: Zone 5 & ESA Harwell Campus, Didcot OX11

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1	None Supplied	S	2441120	а	None Supplied	None Supplied	None Supplied
BH5	None Supplied	S	2441121	а	None Supplied	None Supplied	None Supplied



APPENDIX 4 – GEOTECHNICAL LABORATORY TEST RESULTS



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Jomas Associates Ltd	Client Reference:	JJ2609
Client Address:	Lakesida Hausa, 1 Eurzagraund Way	Job Number:	22-85862
	Stockley Park LIB11 1BD	Date Sampled:	Not Given
		Date Received:	20/09/2022
Contact:	Tom Elbourne	Date Tested:	27/09/2022
Site Address:	Zone 5 & ESA Harwell Campus Didcot OX11 0FD	Sampled By:	Not Given
Testing carried out at i2	2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland		
Test Results:			
Laboratory Reference:	2434473	Depth Top [m]:	9.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D

Sample Preparation: Tested in natural condition

Light grey slightly sandy CLAY

Sample Description:

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
23	45	24	21	100



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Katarzyna Koziel Technical Reviewer **for and on behalf of i2 Analytical Ltd**

Katapyna

Date Reported: 10/10/2022



Sample Reference:

Sample Description:

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



 Client:
 Jomas Associates Ltd
 Client

 Client Address:
 Jack

 Lakeside House, 1 Furzeground Way,
 Date

 Stockley Park, UB11 1BD
 Date

 Contact:
 Tom Elbourne
 D

 Site Address:
 Zone 5 & ESA Harwell Campus Didcot OX11 0FD
 S

 Testing carried out at 12 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland
 Dept

 Hole No.:
 BH2
 Dept

Brownish grey slightly gravelly slightly sandy CLAY

Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Depth Top [m]: 0.60 Depth Base [m]: Not Given Sample Type: D

Sample Preparation: Tested after washing to remove >425um

Not Given

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL]%	[Wp] %	[lp] %	BS Test Sieve
27	58	29	29	74



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katawyna Koziej

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd


DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client: Client Address:	Jomas Associates Ltd ess: Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD				Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given		
Contact:	Tom E	Ibourne	deat OX11 0ED		Date Rece Date Te Sample	eived: 20/09/2022 ested: 27/09/2022 ed By: Not Given	
Testing carried out at i	2 Analyt	ical Limited, ul. Pionierow 3	9, 41-711 Ruda Slaska, I	Poland	Gample	a by. Not offen	
Test Results: Laboratory Reference: Hole No.: Sample Reference: Sample Description: Sample Preparation:	24344 BH2 Not Gi Light g	76 ven rey sandy CLAY I in natural condition			Depth Top Depth Base Sample ⁻	p [m]: 4.00 e [m]: Not Given Type: D	
As Received Wat Content [W] %	er o	Liquid Limit [WL] %	Plastic Limit [Wp] %	Pla	sticity Index [lp] %	% Passing 425µm BS Test Sieve	
32		43	19		24	100	
80 70 60						line	
50					CIV	A line	



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing - Identification and classification of soil Plasticity Liquid Limit CI Clay L Low below 35 Si Silt Μ Medium 35 to 50 Н High 50 to 70 V Very high

0 Organic exceeding 70

append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Kata Dyna Koziej



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Jomas Associates Ltd Client: Client Address: Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD Tom Elbourne Contact: Site Address: Zone 5 & ESA Harwell Campus Didcot OX11 0FD Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland **Test Results:** Laboratory Reference: 2434477

BH2 Hole No .: Sample Reference: Not Given Light grey slightly gravelly sandy CLAY Sample Description:

Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Depth Top [m]: 6.00 Depth Base [m]: Not Given Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
37	42	21	21	93



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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KataRyna

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Kozier



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Jomas Associates Ltd	Client Reference: J	J2609
Client Address:	Laborida Llavian, 4 Evima maximal Way	Job Number: 2	2-85862
	Lakeside House, T Furzeground way, Stocklov Park, UB11 18D	Date Sampled: N	lot Given
	Stockley Faik, OBTT TBD	Date Received: 2	0/09/2022
Contact:	Tom Elbourne	Date Tested: 2	7/09/2022
Site Address:	Zone 5 & ESA Harwell Campus Didcot OX11 0FD	Sampled By: N	lot Given
Testing carried out at it	2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland		
Test Results:			
Laboratory Reference:	2434479	Depth Top [m]: 1	.00
Hole No.:	BH3	Depth Base [m]: N	lot Given
Sample Reference:	Not Given	Sample Type: D)
Sample Description:	Light grey slightly sandy CLAY		

Tested in natural condition Sample Preparation:

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
22	45	22	23	100



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Kataryna



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Client Refer	
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD	Job Nur Date Sam Date Rece
Contact:	Tom Elbourne	Date Te
Site Address:	Sample	
Testing carried out at it	2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland	
Test Results:		
Laboratory Reference:	2434480	Depth Top
Hole No.:	BH3	Depth Base
Sample Reference:	Not Given	Sample ⁻
Sample Description:	Light grey slightly sandy CLAY	

ence: JJ2609 mber: 22-85862 pled: Not Given eived: 20/09/2022 sted: 27/09/2022 d By: Not Given

p [m]: 3.00 e [m]: Not Given Type: D

Sample Preparation:	Tested in natural condition

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
26	51	22	29	100



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Katapyna



PLASTICITY INDEX

40

30

20

10

0 0

Remarks:

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Jomas As	ssociates Ltd		Client Refer	rence: JJ2609
Client Address: Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD			Job Nu Date Sar Date Rec	mber: 22-85862 npled: Not Given eived: 20/09/2022	
Contact:	Tom Elbo	ourne		Date Te	ested: 27/09/2022
Site Address:	Zone 5 &	ESA Harwell Campus D	idcot OX11 0FD	Sample	ed By: Not Given
Testing carried out at it	2 Analytica	l Limited, ul. Pionierow 3	39, 41-711 Ruda Slaska, Poland	1	-
Test Results:					
Laboratory Reference:	2434482			Depth To	p [m]: 6.00
Hole No.:	BH3			Depth Bas	e [m]: Not Given
Sample Reference:	Not Giver	า		Sample	Туре: D
Sample Description:	Light grey	y sandy CLAY			
Sample Preparation:	Tested in	natural condition			
As Received Wate Content [W] %	er	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [lp] %	% Passing 425µm BS Test Sieve
23		42	21	21	100
80					
70				U	line
<u></u>					
60				CIV	

Plasticity Liquid Limit CI Clay L Low below 35 Si Silt Μ Medium 35 to 50 Н High 50 to 70 V Very high exceeding 70 0 Organic append to classification for organic material (eg CIHO) Note: Water Content by BS 1377-2: 1990: Clause 3.2

CIM

SiM

50

LIQUID LIMIT Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing - Identification and classification of soil

40

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Date Reported: 10/10/2022

siv

80

90

100

Kata Dyna Koziej

C Н

SIH

60

70

CIL

SiL

30

CIL - SiL

20

10



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Jomas Associates Ltd	Client Reference: JJ2609
Client Address:	Lebeside Lleves A Furscare and Way	Job Number: 22-85862
	Lakeside House, 1 Furzeground way, Stocklov Park, UB11 18D	Date Sampled: Not Given
	Slockley Faik, OBTT TDD	Date Received: 20/09/2022
Contact:	Tom Elbourne	Date Tested: 27/09/2022
Site Address:	Zone 5 & ESA Harwell Campus Didcot OX11 0FD	Sampled By: Not Given
Testing carried out at iz	2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland	
Test Results:		
Laboratory Reference:	2434483	Depth Top [m]: 1.00
Hole No.:	BH5	Depth Base [m]: Not Given
Sample Reference:	Not Given	Sample Type: D

Sample Preparation: Tested in natural condition

Light grey slightly sandy CLAY

Sample Description:

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
25	47	24	23	100



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Kataryna



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Jomas Associates Ltd	Client Refer
Client Address:	Lakocida Housa, 1 Eurzaground Way	Job Nu
	Stocklov Dark LIB11 1BD	Date San
	Slockley Park, OBTT TBD	Date Rec
Contact:	Tom Elbourne	Date Te
Site Address:	Sample	
Testing carried out at it	2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland	
Test Results:		
Laboratory Reference:	2434484	Depth To
Hole No.:	BH5	Depth Bas
Sample Reference:	Not Given	Sample
Sample Description:	Light grey slightly sandy CLAY	

ient Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Depth Top [m]: 2.00 Depth Base [m]: Not Given Sample Type: D

Sample Preparation: Tested in natural condition

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
23	45	21	24	100



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Kataryna



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Jomas As	sociates Ltd		Client Refe	rence: JJ2609
Client Address:	Lakeside I	House 1 Furzearound W	av	Job Nu	mber: 22-85862
	Stockley F	Park, UB11 1BD	<i>ay</i> ;	Date Sar	npled: Not Given
	,	, -		Date Rec	eived: 20/09/2022
Contact:	Tom Elbou	urne		Date T	ested: 27/09/2022
Site Address:	Zone 5 & I	ESA Harwell Campus Dic	lcot OX11 0FD	Sample	ed By: Not Given
Testing carried out at it	2 Analytical	Limited, ul. Pionierow 39	, 41-711 Ruda Slaska, Polar	nd	
Test Results:					
Laboratory Reference:	2434486			Depth To	op [m]: 5.50
Hole No.:	BH5			Depth Bas	e [m]: Not Given
Sample Reference:	Not Given			Sample	Type: D
Sample Description:	Light grey	sandy CLAY			
Sample Preparation: As Received Wat Content [W] %	Tested in r	natural condition Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [lp] %	% Passing 425µm BS Test Sieve
27		42	22	20	100
80					line
60 +					



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing - Identification and classification of soil Plasticity Liquid Limit CI Clay L Low below 35 Si Silt Μ Medium 35 to 50 Н High 50 to 70 V Very high exceeding 70

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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0

Organic

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Kata Dyna Koziej

append to classification for organic material (eg CIHO)



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



+041								
Client:	Jomas	s Associates Ltd					Client Refe	rence: JJ2609
Client Address:	Lakes	ide House, 1 Eurzear	ound Wav				Job Nu	mber: 22-85862
	Stock	ey Park, UB11 1BD	ound way,				Date Sar	npled: Not Given
0	T						Date Rec	eived: 20/09/2022
Contact:	Tom E		nua Didaat				Date I	ested: 27/09/2022
Site Address:	Zone:	tion Limited up Dioni	ipus Diacol	711 Pudo S	looko Dolond		Sample	ed By: Not Given
Test Desults:	at iz Anaiy	licai Linnieu, ul. Fioni	eiuw 39, 41		iaska, Fulanu			
Laboratory Poforono	24344	87					Dopth To	n [m]· 1 20
	70. 24344 TP1	.07					Depth Bas	p [m]: Not Given
Sample Reference	Not G	iven					Sample	Type: D
Sample Description:	Light	prev sandv CLAY					Campie	Type: =
		,, <u>.</u>						
Sample Preparation	: Teste	d in natural condition						
As Received W	ater	Liquid Limit		Plastic	Limit	Plas	ticity Index	% Passing 425µm
Content [W]	%	[WL]%		[Wp]%		[lp] %	BS Test Sieve
20		38		21			17	100
<u> 00 – – – – – – – – – – – – – – – – – –</u>								
80								
70								line
60							/	
							CIV	
50						1	Civ	
50 -								A line
х Ц								
- → ·								
5				1			siv	
30 			-					
2				CIM				

SiM

40

CIL

SiL

30

0

Organic

LIQUID LIMIT

50

Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing - Identification and classification of soil Plasticity Liquid Limit CI Clay L Low below 35 Si Silt Μ Medium 35 to 50 Н High 50 to 70 V Very high exceeding 70

Note: Water Content by BS 1377-2: 1990: Clause 3.2

CIL - SiL

20

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Remarks:

20

10

0 0

Signed:

Kata Dyna Koziej

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

80

90

100

SIH

60

70

append to classification for organic material (eg CIHO)



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



 Client:
 Jomas Associates Ltd
 Client

 Client Address:
 Lakeside House, 1 Furzeground Way,
Stockley Park, UB11 1BD
 Da

 Contact:
 Tom Elbourne
 Da

 Site Address:
 Zone 5 & ESA Harwell Campus Didcot OX11 0FD
 Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

 Test Results:

 Laboratory Reference:
 2434490
 Da

 Laboratory Reference:
 2434490

 Hole No.:
 TP4

 Sample Reference:
 Not Given

 Sample Description:
 Light grey slightly gravelly sandy CLAY

Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Depth Top [m]: 1.50 Depth Base [m]: Not Given Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425μm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
20	41	20	21	99



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Katarzyna Koziel Technical Reviewer **for and on behalf of i2 Analytical Ltd**



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



 Client:
 Jomas Associates Ltd
 Client

 Client:
 Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
 Jat

 Contact:
 Tom Elbourne
 Dat

 Site Address:
 Zone 5 & ESA Harwell Campus Didcot OX11 0FD
 S

 Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland
 Test

 Laboratory Reference:
 2434491
 Dep

Laboratory Reference:2434491Hole No.:TP5Sample Reference:Not GivenSample Description:Light grey slightly gravelly sandy CLAY

Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Depth Top [m]: 1.20 Depth Base [m]: Not Given Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
21	42	23	19	99



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



 Client:
 Jomas Associates Ltd
 Clien

 Client Address:
 Lakeside House, 1 Furzeground Way,
Stockley Park, UB11 1BD
 Da

 Contact:
 Tom Elbourne
 Da

 Site Address:
 Zone 5 & ESA Harwell Campus Didcot OX11 0FD
 Sa

 Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland
 Test

 Laboratory Reference:
 2434492
 De

Laboratory Reference:2434492Hole No.:TP6Sample Reference:Not GivenSample Description:Light grey slightly gravelly sandy CLAY

Sample Preparation: Tested after >425um removed by hand

Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Depth Top [m]: 1.20 Depth Base [m]: Not Given Sample Type: D

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
22	43	23	20	89



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Jomas A	ssociates Ltd		Client Refe	rence: JJ2609	
Client Address:	Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD			Job Nu Date Sai Date Rec	umber: 22-85862 mpled: Not Given eeived: 20/09/2022	
Site Address:				Date 1	ested. 21/09/2022	
Testing carried out at i	2 Analytica	I Limited, ul. Pionierow 39,	41-711 Ruda Slaska, Poland	Sampi	ed by. Not Given	
Test Results:						
Laboratory Reference:	2434493			Depth To	op [m]: 1.20	
Hole No.:	TP7			Depth Base [m]: Not Given		
Sample Reference:	Not Give	n		Sample Type: D		
Sample Description:	Light gre	y sandy CLAY				
Sample Preparation:	Tested in	natural condition				
As Received Wate Content [W] %	er	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [lp] %	% Passing 425µm BS Test Sieve	
21		42	21	21	100	



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Katapyna



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Jomas Ass	ociates Ltd		Client Refe	rence: JJ2609	
Client Address: Contact:	Lakeside H Stockley Pa Tom Elbou	ouse, 1 Furzeground Wa ark, UB11 1BD me SA Hanvell Campus Dic	ay,	Job Nu Date Sar Date Rec Date T Sampl	mber: 22-85862 npled: Not Given eived: 20/09/2022 ested: 27/09/2022 od By: Not Given	
Testing carried out at it	2 Analvtical I	imited, ul. Pionierow 39	. 41-711 Ruda Slaska, Poland	Samp	ed by. Not Olven	
Test Results:			,			
Laboratory Reference:	2434494			Depth To	op [m]: 2.40	
Hole No.:	TP8			Depth Base [m]: Not Given		
Sample Reference:	Not Given			Sample	Type: D	
Sample Description:	Light grey s	andy CLAY				
Sample Preparation:	Tested in n	atural condition				
As Received Wate Content [W] %	er ,	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve	
23		42	21	21	100	



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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0

Organic

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Katapyna

append to classification for organic material (eg CIHO)



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Jomas Associates Ltd		Client Refe	rence: JJ2609	
Client Address:	Lakeside House, 1 Furzeground V Stockley Park, UB11 1BD	Vay,	Job Nu Date Sar Date Rec	imber: 22-85862 npled: Not Given reived: 20/09/2022	
Contact:	Tom Elbourne		Date T	ested: 27/09/2022	
Site Address:	Zone 5 & ESA Harwell Campus D	idcot OX11 0FD	Sample	ed By: Not Given	
Testing carried out at i	2 Analytical Limited, ul. Pionierow 3	89, 41-711 Ruda Slaska, Poland	1		
Test Results:					
Laboratory Reference:	2434495		Depth To	op [m]: 2.40	
Hole No.:	TP9		Depth Base [m]: Not Given		
Sample Reference:	Not Given		Sample Type: D		
Sample Description:	Light grey sandy CLAY				
Sample Preparation:	Tested in natural condition				
As Received Wate Content [W] %	er Liquid Limit	Plastic Limit [Wp] %	Plasticity Index [lp] %	% Passing 425µm BS Test Sieve	
21	44	24	20	100	



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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0

Organic

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Katapyna

append to classification for organic material (eg CIHO)



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



 Client:
 Jomas Associates Ltd
 Client

 Client Address:
 Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
 Jote

 Contact:
 Tom Elbourne
 Date

 Site Address:
 Zone 5 & ESA Harwell Campus Didcot OX11 0FD
 Sa

 Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland
 Dep

Laboratory Reference:2434496Hole No.:TP10Sample Reference:Not GivenSample Description:Light grey slightly gravelly sandy CLAY

Sample Preparation: Tested after >425um removed by hand

Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Depth Top [m]: 1.20 Depth Base [m]: Not Given Sample Type: D

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
20	41	20	21	99



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

KataRyna

Date Reported: 10/10/2022



Hole No .:

Sample Reference:

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



 Client:
 Jomas Associates Ltd
 Client Refu

 Client Address:
 Lakeside House, 1 Furzeground Way,
Stockley Park, UB11 1BD
 Job N

 Contact:
 Tom Elbourne
 Date Sa

 Site Address:
 Zone 5 & ESA Harwell Campus Didcot OX11 0FD
 Samp

 Test Results:
 Laboratory Reference:
 2434497
 Depth T

Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Depth Top [m]: 2.00 Depth Base [m]: Not Given Sample Type: D

Sample Description: Light grey slightly gravelly slightly sandy CLAY Sample Preparation: Tested after >425um removed by hand

TP11

Not Given

 As Received Water
 Liquid Limit
 Plastic Limit
 Plasticity Index
 % Passing 425µm

 Content [W] %
 [WL] %
 [Wp] %
 [Ip] %
 BS Test Sieve



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

KataRyna

Date Reported: 10/10/2022



Sample Reference:

Sample Description:

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Jomas Associates Ltd Client Reference: JJ2609 Client: Client Address: Job Number: 22-85862 Lakeside House, 1 Furzeground Way, Date Sampled: Not Given Stockley Park, UB11 1BD Date Received: 20/09/2022 Tom Elbourne Contact: Date Tested: 27/09/2022 Site Address: Zone 5 & ESA Harwell Campus Didcot OX11 0FD Sampled By: Not Given Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland **Test Results:** Laboratory Reference: 2434498 Depth Top [m]: 1.20 TP12 Hole No .:

Depth Base [m]: Not Given Sample Type: D

Sample Preparation: Tested after washing to remove >425um

Brownish grey gravelly slightly sandy CLAY

Not Given

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
10	51	28	23	50



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd



Sample Reference:

Sample Description:

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



 Client:
 Jomas Associates Ltd
 C

 Client Address:
 Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
 C

 Contact:
 Tom Elbourne
 Stockley Park, UB11 1BD

 Site Address:
 Zone 5 & ESA Harwell Campus Didcot OX11 0FD
 Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

 Test Results:

 Laboratory Reference:
 2434499

 Hole No.:
 TP13

Light brown slightly gravelly slightly sandy CLAY

Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Depth Top [m]: 2.40 Depth Base [m]: Not Given Sample Type: D

Sample Preparation: Tested after >425um removed by hand

Not Given

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL]%	[Wp] %	[lp] %	BS Test Sieve
18	46	24	22	89



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd



Sample Reference:

Sample Description:

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



 Client:
 Jomas Associates Ltd

 Client Address:
 Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

 Contact:
 Tom Elbourne

 Site Address:
 Zone 5 & ESA Harwell Campus Didcot OX11 0FD

 Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

 Test Results:

 Laboratory Reference:
 2434500

 Hole No.:
 WS2

Brown slightly gravelly slightly sandy CLAY

Date Tested: 27/09/2022 Sampled By: Not Given

Client Reference: JJ2609

Job Number: 22-85862

Date Sampled: Not Given

Date Received: 20/09/2022

Depth Top [m]: 0.50 Depth Base [m]: Not Given Sample Type: D

Sample Preparation: Tested after washing to remove >425um

Not Given

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
11	52	21	31	75



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katarzyna Koziel Technical Reviewer **for and on behalf of i2 Analytical Ltd**



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Jomas Associates Ltd Client Reference: JJ2609 Client: Client Address: Job Number: 22-85862 Lakeside House, 1 Furzeground Way, Date Sampled: Not Given Stockley Park, UB11 1BD Date Received: 20/09/2022 Tom Elbourne Contact: Date Tested: 27/09/2022 Site Address: Zone 5 & ESA Harwell Campus Didcot OX11 0FD Sampled By: Not Given Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland **Test Results:** Laboratory Reference: 2434501

Depth Top [m]: 1.00 Depth Base [m]: Not Given Sample Type: D

Laboratory Reference:2434501Hole No.:WS3Sample Reference:Not GivenSample Description:Light brown gravelly slightly sandy CLAY

Sample Preparation: Tested after washing to remove >425um

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
22	54	23	31	52



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Jomas Associates Ltd	Client Reference: JJ2	2609
Client Address:	Letreside Lleves 4 Europeneurod Meu	Job Number: 22-	-85862
	Lakeside House, 1 Furzeground Way, Stockley Park LIB11 1BD	Date Sampled: No	ot Given
		Date Received: 20/	/09/2022
Contact:	Tom Elbourne	Date Tested: 27/	/09/2022
Site Address:	Zone 5 & ESA Harwell Campus Didcot OX11 0FD	Sampled By: No	ot Given
Testing carried out at i2	2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland		
Test Results:			
Laboratory Reference:	2434502	Depth Top [m]: 1.0	00
Hole No.:	WS4	Depth Base [m]: No	ot Given
Sample Reference:	Not Given	Sample Type: D	

Tested in natural condition Sample Preparation:

Sample Description:

Light brown slightly sandy CLAY

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
25	51	25	26	100



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katapyna Kozier

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd



Hole No .:

Sample Reference:

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Jomas Associates Ltd Client Reference: JJ2609 Client: Client Address: Job Number: 22-85862 Lakeside House, 1 Furzeground Way, Date Sampled: Not Given Stockley Park, UB11 1BD Date Received: 20/09/2022 Tom Elbourne Contact: Date Tested: 27/09/2022 Site Address: Zone 5 & ESA Harwell Campus Didcot OX11 0FD Sampled By: Not Given Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland **Test Results:** Laboratory Reference: 2434503

Depth Top [m]: 2.00 Depth Base [m]: Not Given Sample Type: D

Brown slightly gravelly CLAY Sample Description: Sample Preparation: Tested after washing to remove >425um

Not Given

WS5

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
26	92	37	55	82



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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0

Organic

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

KataRyna

append to classification for organic material (eg CIHO)



Hole No .:

Sample Reference:

Sample Description:

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Jomas Associates Ltd Client Reference: JJ2609 Client: Client Address: Job Number: 22-85862 Lakeside House, 1 Furzeground Way, Date Sampled: Not Given Stockley Park, UB11 1BD Date Received: 20/09/2022 Tom Elbourne Contact: Date Tested: 27/09/2022 Site Address: Zone 5 & ESA Harwell Campus Didcot OX11 0FD Sampled By: Not Given Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland **Test Results:** Laboratory Reference: 2434505

Depth Top [m]: 0.50 Depth Base [m]: Not Given Sample Type: D

Sample Preparation: Tested after washing to remove >425um

Brown slightly gravelly sandy CLAY

WS7

Not Given

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
11	39	20	19	70



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Jomas Associates Ltd Client: Client Address: Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD Tom Elbourne Contact: Site Address: Zone 5 & ESA Harwell Campus Didcot OX11 0FD Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland **Test Results:**

Laboratory Reference: 2434506 BH5 Hole No .: Sample Reference: Not Given Light grey gravelly very sandy CLAY Sample Description:

Sample Preparation: Tested after washing to remove >425um Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Depth Top [m]: 0.60 Depth Base [m]: Not Given Sample Type: D

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
14	29	16	13	56



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

i2 Analytical Ltd Unit 8 Harrowden Road **Brackmills Industrial Estate** Northampton NN4 7EB



Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Jomas Associates Ltd Client Address: Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

Water Content by BS 1377-2:1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Contact:	Tom Elbourne
Site Address:	Zone 5 & ESA Harwell Campus Didcot OX11 0FD
Testing carried out at	i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

TESTING

4041

Client:

		Sample				_		tent [W]	tent '892-2	Atterberg				Density			Ŧ	
Laboratory Hole Reference No.		Reference	Depth Top	Depth Base	Туре	Description	Remarks	Water Con BS 1377-2 [Water Con BS EN ISO 17 [W]	% Passing 425um	WL	Wp	lp	bulk	dry	PD	Total Porosity	
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%	
2434473	BH1	Not Given	9.00	Not Given	D	Light grey slightly sandy CLAY	Atterberg 4 Point	23		100	45	24	21					
2434474	BH2	Not Given	0.60	Not Given	D	Brownish grey slightly gravelly slightly sandy CLAY	Atterberg 4 Point	27		74	58	29	29					
2434476	BH2	Not Given	4.00	Not Given	D	Light grey sandy CLAY	Atterberg 4 Point	32		100	43	19	24					
2434477	BH2	Not Given	6.00	Not Given	D	Light grey slightly gravelly sandy CLAY	Atterberg 4 Point	37		93	42	21	21					
2434479	BH3	Not Given	1.00	Not Given	D	Light grey slightly sandy CLAY	Atterberg 4 Point	22		100	45	22	23					
2434480	BH3	Not Given	3.00	Not Given	D	Light grey slightly sandy CLAY	Atterberg 4 Point	26		100	51	22	29					
2434482	BH3	Not Given	6.00	Not Given	D	Light grey sandy CLAY	Atterberg 4 Point	23		100	42	21	21					
2434506	BH5	Not Given	0.60	Not Given	D	Light grey gravelly very sandy CLAY	Atterberg 4 Point	14		56	29	16	13					
2434483	BH5	Not Given	1.00	Not Given	D	Light grey slightly sandy CLAY	Atterberg 4 Point	25		100	47	24	23					
2434484	BH5	Not Given	2.00	Not Given	D	Light grey slightly sandy CLAY	Atterberg 4 Point	23		100	45	21	24					

Note: # Non accredited; NP - Non plastic

Comments:

Signed:



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SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Jomas Associates Ltd Client Address: Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

Water Content by BS 1377-2:1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Tom Elbourne Contact: Site Address: Zone 5 & ESA Harwell Campus Didcot OX11 0FD Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

TESTING

4041

Client:

			Sample	Sample				tent [W]	tent 892-2		Atte	rberg			Density		#	
Laboratory Hole Reference No.		Reference	Depth Top	Depth Base	Туре	Description	Remarks	Water Con BS 1377-2 [Water Con BS EN ISO 17 I W 1	% Passing 425um	WL	Wp	lp	bulk	dry	PD	Total Porosity	
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%	
2434486	BH5	Not Given	5.50	Not Given	D	Light grey sandy CLAY	Atterberg 4 Point	27		100	42	22	20					
2434487	TP1	Not Given	1.20	Not Given	D	Light grey sandy CLAY	Atterberg 4 Point	20		100	38	21	17					
2434496	TP10	Not Given	1.20	Not Given	D	Light grey slightly gravelly sandy CLAY	Atterberg 4 Point	20		99	41	20	21					
2434497	TP11	Not Given	2.00	Not Given	D	Light grey slightly gravelly slightly sandy CLAY	Atterberg 4 Point	27		99	45	24	21					
2434498	TP12	Not Given	1.20	Not Given	D	Brownish grey gravelly slightly sandy CLAY	Atterberg 4 Point	10		50	51	28	23					
2434499	TP13	Not Given	2.40	Not Given	D	Light brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	18		89	46	24	22					
2434490	TP4	Not Given	1.50	Not Given	D	Light grey slightly gravelly sandy CLAY	Atterberg 4 Point	20		99	41	20	21					
2434491	TP5	Not Given	1.20	Not Given	D	Light grey slightly gravelly sandy CLAY	Atterberg 4 Point	21		99	42	23	19					
2434492	TP6	Not Given	1.20	Not Given	D	Light grey slightly gravelly sandy CLAY	Atterberg 4 Point	22		89	43	23	20					
2434493	TP7	Not Given	1.20	Not Given	D	Light grey sandy CLAY	Atterberg 4 Point	21		100	42	21	21					

Note: # Non accredited; NP - Non plastic

Comments:

Signed:



Katarzyna Koziel **Technical Reviewer** for and on behalf of i2 Analytical Ltd

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SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given

Jomas Associates Ltd Client Address: Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

Water Content by BS 1377-2:1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Tom Elbourne Contact: Site Address: Zone 5 & ESA Harwell Campus Didcot OX11 0FD Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

TESTING

4041

Client:

		San		2		I		tent [W]	tent 892-2		Atte	rberg			Density		Ŧ	
Laboratory Hole Reference No.		Reference	Depth Top	Depth Base	Туре	Description	Remarks	Water Con BS 1377-2 [Water Co BS 1377-2 Water Co BS EN ISO 1 [W]		WL	Wp	lp	bulk	dry	PD	Total Porosity	
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%	
2434494	TP8	Not Given	2.40	Not Given	D	Light grey sandy CLAY	Atterberg 4 Point	23		100	42	21	21					
2434495	TP9	Not Given	2.40	Not Given	D	Light grey sandy CLAY	Atterberg 4 Point	21		100	44	24	20					
2434500	WS2	Not Given	0.50	Not Given	D	Brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	11		75	52	21	31					
2434501	WS3	Not Given	1.00	Not Given	D	Light brown gravelly slightly sandy CLAY	Atterberg 4 Point	22		52	54	23	31					
2434502	WS4	Not Given	1.00	Not Given	D	Light brown slightly sandy CLAY	Atterberg 4 Point	25		100	51	25	26					
2434503	WS5	Not Given	2.00	Not Given	D	Brown slightly gravelly CLAY	Atterberg 4 Point	26		82	92	37	55					
2434505	WS7	Not Given	0.50	Not Given	D	Brown slightly gravelly sandy CLAY	Atterberg 4 Point	11		70	39	20	19					

Note: # Non accredited; NP - Non plastic

Comments:

Signed:



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DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given



Jomas Associates Ltd

Client Address:

Client:

Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

Contact:	Tom Elbourne
Site Address:	Zone 5 & ESA Harwell Campus Didcot OX11 0FD
Testing carried out at	i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

			Sample	2							
Laboratory Reference	Hole No.	Reference	Depth Top m	Depth Base m	Туре	Description	Remarks	wc %	Sample preparation / Oven temperature at the time of testing		
2434473	BH1	Not Given	9.00	Not Given	D	Light grey slightly sandy CLAY		23	Sample was quartered, oven dried at 108.2 °C		
2434474	BH2	Not Given	0.60	Not Given	D	Brownish grey slightly gravelly slightly sandy CLAY		27	Sample was quartered, oven dried at 108.2 °C		
2434476	BH2	Not Given	4.00	Not Given	D	Light grey sandy CLAY		32	Sample was quartered, oven dried at 108.2 °C		
2434477	BH2	Not Given	6.00	Not Given	D	Light grey slightly gravelly sandy CLAY		37	Sample was quartered, oven dried at 108.2 °C		
2434479	BH3	Not Given	1.00	Not Given	D	Light grey slightly sandy CLAY		22	Sample was quartered, oven dried at 108.2 °C		
2434480	BH3	Not Given	3.00	Not Given	D	Light grey slightly sandy CLAY		26	Sample was quartered, oven dried at 108.2 °C		
2434482	BH3	Not Given	6.00	Not Given	D	Light grey sandy CLAY		23	Sample was quartered, oven dried at 108.2 °C		
2434506	BH5	Not Given	0.60	Not Given	D	Light grey gravelly very sandy CLAY		14	Sample was quartered, oven dried at 108.2 °C		
2434483	BH5	Not Given	1.00	Not Given	D	Light grey slightly sandy CLAY		25	Sample was quartered, oven dried at 108.2 °C		
2434484	BH5	Not Given	2.00	Not Given	D	Light grey slightly sandy CLAY		23	Sample was quartered, oven dried at 108.2 °C		

Comments:

Signed:



Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

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DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given



Jomas Associates Ltd

Client Address:

Client:

Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

Contact:	Tom Elbourne
Site Address:	Zone 5 & ESA Harwell Campus Didcot OX11 0FD
Testing carried out at	i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

			Sample	2							
Laboratory Reference	Hole No.	Reference	Depth Top m	Depth Base m	Туре	Description	Remarks	wc %	Sample preparation / Oven temperature at the time of testing		
2434486	BH5	Not Given	5.50	Not Given	D	Light grey sandy CLAY		27	Sample was quartered, oven dried at 108.2 °C		
2434487	TP1	Not Given	1.20	Not Given	D	Light grey sandy CLAY		20	Sample was quartered, oven dried at 108.2 °C		
2434496	TP10	Not Given	1.20	Not Given	D	Light grey slightly gravelly sandy CLAY		20	Sample was quartered, oven dried at 108.2 °C		
2434497	TP11	Not Given	2.00	Not Given	D	Light grey slightly gravelly slightly sandy CLAY		27	Sample was quartered, oven dried at 106.1 °C		
2434498	TP12	Not Given	1.20	Not Given	D	Brownish grey gravelly slightly sandy CLAY		10	Sample was quartered, oven dried at 108.2 °C		
2434499	TP13	Not Given	2.40	Not Given	D	Light brown slightly gravelly slightly sandy CLAY		18	Sample was quartered, oven dried at 106.3 °C		
2434490	TP4	Not Given	1.50	Not Given	D	Light grey slightly gravelly sandy CLAY		20	Sample was quartered, oven dried at 108.2 °C		
2434491	TP5	Not Given	1.20	Not Given	D	Light grey slightly gravelly sandy CLAY		21	Sample was quartered, oven dried at 108.2 °C		
2434492	TP6	Not Given	1.20	Not Given	D	Light grey slightly gravelly sandy CLAY		22	Sample was quartered, oven dried at 108.2 °C		
2434493	TP7	Not Given	1.20	Not Given	D	Light grey sandy CLAY		21	Sample was quartered, oven dried at 108.2 °C		

Comments:

Signed:



Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

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DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given



Jomas Associates Ltd

Client Address:

Client:

Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

Contact:	Tom Elbourne
Site Address:	Zone 5 & ESA Harwell Campus Didcot OX11 0FD
Testing carried out at	i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

			Sample	e							
Laboratory Reference	Hole No.	Reference	Depth Top m	Depth Base m	Туре	Description	Remarks	wc %	Sample preparation / Oven temperature at the time of testing		
2434494	TP8	Not Given	2.40	Not Given	D	Light grey sandy CLAY		23	Sample was quartered, oven dried at 108.2 °C		
2434495	TP9	Not Given	2.40	Not Given	D	Light grey sandy CLAY		21	Sample was quartered, oven dried at 108.2 °C		
2434500	WS2	Not Given	0.50	Not Given	D	Brown slightly gravelly slightly sandy CLAY		11	Sample was quartered, oven dried at 107.2 °C		
2434501	WS3	Not Given	1.00	Not Given	D	Light brown gravelly slightly sandy CLAY		22	Sample was quartered, oven dried at 108.2 °C		
2434502	WS4	Not Given	1.00	Not Given	D	Light brown slightly sandy CLAY		25	Sample was quartered, oven dried at 108.2 °C		
2434503	WS5	Not Given	2.00	Not Given	D	Brown slightly gravelly CLAY		26	Sample was quartered, oven dried at 108.2 °C		
2434505	WS7	Not Given	0.50	Not Given	D	Brown slightly gravelly sandy CLAY		11	Sample was quartered, oven dried at 108.2 °C		

Comments:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Page 1 of 1



DETERMINATION OF PARTICLE SIZE DISTRIBUTION Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Clie	ent:			Jomas Associat	es Ltd												(Clier	nt Re	efer	enc	e: J	J26	09				
Clie	ent Ad	ldress:		Lakeside House Stockley Park, L	, 1 Furzeg JB11 1BD	grour	nd Wa	ay,										Da	Job ate S	Nu San Rec	mb nple eive	er: 2 ed: N ed: 2	22-8 Not (20/09	5862 Given 9/202	1 22			
Cor Site Tes	ntact: e Addi s <i>ting c</i>	ress: carried ou	ıt at i2	Tom Elbourne Zone 5 & ESA H Analytical Limite	larwell Ca ed, ul. Pior	mpu niero	ıs Did 9 <i>w 39</i> ,	cot O , 41-7	X11 711 F	0FI Ruda	D a Si	laska,	Po	land				De	Date San	e Te nple	este ed E	,a. 2 ∍d: 2 3y: N	27/09 Not (3/202 3/202 3iven	!2 1			
Te	st Re	sults:																										
Lab	orato	ry Refere	nce:	2434471														D	epth	То	p [r	n]: 3	8.00					
Hol	e No.	:		BH1														De	oth E	Bas	e [r	n]: N	lot (Given	1			
Sar	mple F	Reference	e:	Not Given														S	Sam	ple	Тур	be: C)					
Sar	mple [Descriptic	on:	Light grey sandy	CLAY					_																		
Sai	mple F	Preparatio	on:	Sample was qua	artered, ov	en c	dried a	at 108	3.2 °(C ai	nd k	oroken	dc	own by ha	and.					-			_					
		CLAY	Fine	SILT	Coarse		Fine		<u>SAN</u> Jedii	D Im		Coarse	_	Fine		<u>IRAVEL</u> Aedium	-	Coa	irse	- (СОВ	BLES		BOU	ILDE	RS		
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			Siev	/ing	1	Se	edime	entati	on				Г	Sa	mpl	e Prop	orti	ons	;				%	dry	ma	ss		-
	Pa	rticle Size	e mm	% Passing	Particle	Size	e mm	%	ώ Pa	ssir	ıg		Ì	√ery coai Gravel	rse									0				
		500		100								-		Sand										9				
		300		100									F															
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		20		100 Uniformity Coef							efficien	nt							N//	4								

90 Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

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Remarks:

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Signed:

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Katasyna Kozier

Curvature Coefficient

14688-2:2018

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Uniformity Coefficient calculated in accordance with BS EN ISO



DETERMINATION OF PARTICLE SIZE DISTRIBUTION Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Clie	ent:			Jomas Associat	es Ltd						Client Ref	erence: JJ	2609	
Clie	ent Ad	dress:		Lakeside House Stockley Park, U	e, 1 Furzeç JB11 1BD	ground Wa	ıy,				Job N Date Sa Date Re	lumber: 22 ampled: No eceived: 20	-85862 it Given /09/2022	
Cor	ntact:			Tom Elbourne							Date	Tested: 27	/09/2022	
Site	e Addr	ess:		Zone 5 & ESA H	larwell Ca	mpus Dide	cot OX11 0F	D			Samp	oled By: No	t Given	
Tes	sting c	arried o	out at i2	Analytical Limite	ed, ul. Piol	nierow 39,	41-711 Ruda	a Slaska, I	Poland			-		
Te	st Re	sults:												
Lab	orato	ry Refer	ence:	2434472							Depth T	op [m]: 7.0	00	
Hol	e No.:	-		BH1							Depth Ba	ase [m]: No	t Given	
Sar	nple F	Reference	ce:	Not Given							Sampl	e Type: D		
Sar	nple D	Descript	ion:	Light grey slight	ly sandy C	CLAY								
Sar	nple F	reparat	tion:	Sample was qua	artered, ov	ven dried a	it 108.2 °C ai	nd broken	down by ł	nand.				
	_	CLAY		SILT			SAND	I		GRAVEL		COBBLES	BOULDERS	
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			Siev	ving		Sedime	entation		S	ample Prop	ortions		% dry mass	
	Do	tiolo Si	70 mm	% Deceing	Dortiolo	Sizo mm	% Dessir		Very coa	arse			0	
	Fai		ze mm	% Fassing	Faiticle	Size min	70 F d 5 5 1	ig	Gravel				1	
		500		100					Sand				7	
		300		100	-∥							_		
		150		100					Fines <0	J.U63mm			92	
		125		100										
	-	75		100						Grading An	alvsis			
		10		100						or a anning / an	ui y 010			

Grading Analysis		
D100	mm	10
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		N/A
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

63

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Remarks:

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92 Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

> Signed: Katasyna Koziej

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd



DETERMINATION OF PARTICLE SIZE DISTRIBUTION Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Clie	ent:			Jomas /	Associat	es Ltd																C	Clier	nt F	Refe	ren	ice:	JJ	260	9				
Clie	ent Ad	ldress:		Lakesid Stockley	e House y Park, l	e, 1 Furz JB11 1I	zegro BD	ound	d Wa	ıy,													Da	Jok ate	Sai	umt npl	ber: led:	22 No	:-85 ot G	862 iven '202'	2			
Cor Site <i>Te</i> s	ntact: e Addi s <i>ting c</i>	ress: carried ou	ut at i2	Tom Ell Zone 5 <i>Analytic</i>	oourne & ESA H cal Limite	larwell ed, ul. F	Carr Pioni	npus erov	5 Dido v 39,	cot O 41-7	X11 711 F	0F Rud	D la S	las	ka, F	Pola	and						Da	Da Sa	te T mpl	est ed	ed: By:	20 27 No	709/ 7/09/ ot G	/202. iven	2			
Te	st Re	sults:		í					,						,																			•
Lab	orato	ry Refere	ence:	243447	5																		D	eptl	h To	pp [m]:	2.0	00					
Hol	e No.	:		BH2																			Dej	oth	Ba	se [m]:	No	ot G	iven				
Sai	mple F	Referenc	e:	Not Give	en																		S	Sam	nple	Ту	pe:	D						
Sar	mple [Descriptio	on:	Light gr	ey sandy	/ CLAY																												
Sa	mple [Preparati	on:	Sample	was qua	artered,	ove	n dr	ied a	at 108	3.2 °	Сa	nd l	bro	ken	dov	vn b	y ha	ind.															
		CLAY	Fino	S	SILT	Coore	_		ino		SAN Aodiu			Cor	arco	+	C i	~~~		GR Mo	AVEL Nium	·	Cor	irco		CO	BBLI	ΞS		BOUI	_DEF	RS		
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		28		1	00											D	10							n	hm	┢								-
		20		1	00									Uniformity Coefficient N/A							-													

90 Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

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Remarks:

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Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Uniformity Coefficient calculated in accordance with BS EN ISO

Katasyna Kozier

Curvature Coefficient

14688-2:2018



DETERMINATION OF PARTICLE SIZE DISTRIBUTION Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Clie	ent:		J	omas Associat	tes Ltd								Client R	eference:	JJ2609		
Clie	ent Ad	ldress:	L	akeside House Stockley Park, I	e, 1 Furzeg JB11 1BD	ground Wa	ay,						Job Date S Date F	Number: 2 Sampled: 1 Received: 2	22-85862 Not Give 20/09/20	<u>?</u> n 22	
Co	ntact:		Т	om Elbourne									Date	e Tested: 2	27/09/20	22	
Site	e Addı	ress:	Z	one 5 & ESA I	Harwell Ca	mpus Did	cot OX1	1 0FD	1				San	npled By:	Not Give	n	
Tes	sting c	arried ou	t at i2 A	Analytical Limite	ed, ul. Pior	nierow 39,	41-711	Ruda	Slaska, I	Poland							
Те	st Re	sults:															
Lab	orato	ry Refere	nce: 2	434478									Depth	Top [m]:	3.00		
Hol	e No.	:	E	8H2									Depth I	Base [m]:	Not Give	n	
Sai	mple F	Reference	e: N	lot Given									Sam	ple Type:	D		
Sai	mple [Descriptio	n: L	ight grey grave	elly sandy (CLAY											
Sar	mple [Preparatio	on: S	ample was qu	artered, ov	en dried a	at 108.2	°C and	d broken	down b	y ha	ind.		_			
				SILT	_		SAI	ND				GRAVEL	-	COBBLES	з во	ULDERS	;
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	0.0	001		0.01		0.1		Partic	cle Size	mm		10		100			1000
			Sievi	ng		Sedime	entation				Sa	mple Propo	rtions		% dry	mass	
	Pa	rticle Size	mm	% Passing	Particle	Size mm	% P	assinc	,	Very	coar	se			C)	
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		90		100													
		75		100							G	Frading Ana	lysis				
		63		100						D100		-	m	m	1.	4	

Grading Anal	ysis	
D100	mm	14
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		N/A
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Remarks:

50

37.5

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70 Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Signed:

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Katasyna Koziej

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd



DETERMINATION OF PARTICLE SIZE DISTRIBUTION Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Clie	ent:			Jomas A	Associat	es Ltd												Cli	ent R	efere	nce:	: JJ2	:609			
Clie	ent Ad	dress:		Lakeside Stockley	e House / Park, L	, 1 Furzeg JB11 1BD	grou	nd Wa	y,										Job 2 Date 2 Date F	Num Samp Recei	ber: bled: ved:	: 22- : Not : 20/	85862 i Give 09/20	2 n 22		
Cor	ntact:			Tom Elb	ourne														Date	e Tes	sted	: 27/	09/20	22		
Site	e Addr	ess:		Zone 5 8	& ESA H	arwell Ca	impu	us Dido	cot O	X11	0FD)							San	nplec	l By	: Not	Give	n		
Tes	sting c	arried c	out at i2	Analytic	al Limite	ed, ul. Pio	niero	ow 39,	41-7	11 R	uda	Sla	ska, F	Polan	d											
Tes	st Re	sults:																								
Lab	orato	ry Refei	rence:	2434481	I													1	Depth	Тор	[m]:	: 5.0	0			
Hol	e No.:			BH3														D	epth I	Base	[m]:	: Not	Give	n		
Sar	nple F	Referen	ce:	Not Give	en														Sam	ple T	ype:	: D				
Sar	nple [Descript	ion:	Light gre	ey slightl	ly gravelly	san	idy CL	AY																	
Sar	nple F	Prepara	tion:	Sample	was qua	artered, ov	ven o	dried a	t 106	6.1 °C	c an	d br	oken	dowr	ı by h	and.										
		CLAY		S	ILT					SANE)			_			GRAVEL	-		- co)BBL	.ES	BO	ULDE	RS	
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	Pa	rticle Siz	ze mm	% Pa	assing	Particle	Size	e mm	%	Pas	sing	9		Ver	y coa	rse)		
	-	500		1	-	-						_	-	Gra	ivel								1	<u>s</u>		
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		90		1	00							_]													
		75		1	00								1	1		Grad	ing An	alysis		Т						

Grading Analysi	S	
D100	mm	20
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		N/A
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

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Remarks:

63

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Signed:

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Katarzyna Koziel Technical Reviewer Katasyna Koziej for and on behalf of i2 Analytical Ltd


DETERMINATION OF PARTICLE SIZE DISTRIBUTION Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Clie	ent:			Jomas Associates Ltd Client Reference: JJ2609															
Clie	ent Ad	dress:	L	akeside House Stockley Park,	e, 1 Furzeg UB11 1BD	ground Wa	ay,						Job N Date S Date Re	Number: 22 ampled: No eceived: 20	-85862 ot Given //09/2022				
Co	ntact:		٦	om Elbourne									Date Tested: 27/09/2022						
Site	e Addr	ess:	Z	Zone 5 & ESA	Harwell Ca	ampus Did	cot OX1	1 0FD					Sam	pled By: No	ot Given				
Tes	sting c	arried ou	ut at i2 /	Analytical Limit	ted, ul. Pio	nierow 39	41-711	Ruda	Slaska	a, P	oland								
Te	st Re	sults:																	
Lab	orator	ry Refere	ence: 2	434485									Depth ⁻	Top [m]: 4.0	00				
Hol	e No.:	-	E	BH5									Depth Ba	ase [m]: No	ot Given				
Sample Reference: Not Given													Samp	le Type: D					
Sar	mple D	Descriptio	on: L	ight grey sligh	ty gravelly	slightly sa	andy CLA	٩Y											
Sai	mple F	Preparati	on: S	Sample was qu	artered, ov	ven dried a	at 108.2	°C and	d brok	en c	lown by ha	nd.							
	-			SILT			SAI					GRAVEL		COBBLES	BOULDERS	Τ			
	100		Fine	Medium	Coarse	Fine	Med	ium	Coar	se	Fine	Medium	Coarse						
	100 -							→→→											
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			Sievi	ng	TI TI	Sedim	entation				Sa	mple Propo	ortions		% dry mass				
	Pa	rticlo Siz	0 mm	% Passing	Particle	Sizo mm	% P	accino			Very coar	se			0				
	Particle Size mn		e min	70 T 8331119			701	assing	,		Gravel				3				
	500		100							Sand				7					
	300 100			_						F '	200								
	150			100	_∥						Fines <0.0	Jogum			90				
		125		100	_∥														
90 75			75 100				<u> </u>				Grading Analysis								
	75	63		100	_				_		D100			2	14				

Grading Analys	IS	
D100	mm	14
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		N/A
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Remarks:

50

37.5

28

20

14

10

6.3

5

3.35

2

1.18

0.6

0.425

0.3

0.212 0.15

0.063

100

100

100

100

100

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95 94

94

90 Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd



DETERMINATION OF PARTICLE SIZE DISTRIBUTION Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:				Jomas Associates Ltd											Client Reference: JJ2609															
Clie	ent Ad	ldress:	L	akesio tockle	de Hous y Park,	e, 1 F UB11	urzeg 1BD	jround	Way	/,					Job Number: 22-85862 Date Sampled: Not Given															
-			_																		Date	Re	cei	ved:	20/	/09/2	2022			
Co	ntact:		-	om El	bourne				D · · ·						Date Tested: 27/09/2022															
Site	e Addi	ress:		one 5	& ESA	Harwe	ell Ca	mpus I	Didc	ot OX	(11 0	-D		_							Sa	amp	led	By:	No	t Giv	/en			
Te	sting c	arried out a	t i2 A	Analyti	cal Limit	ted, ul	. Pior	nierow	39, 4	41-71	1 Ruc	da S	laska,	, P	olan	d														_
Те	st Re	sults:																												
Lat	oorato	ry Referenc	e: 2	2434488																Dep	th T	ор	[m]:	1.5	50					
Ho	le No.		Т	TP2 Dept												n Ba	ise	[m]:	No	t Giv	/en									
Sa	mple F	Reference:	N	Not Given														Sa	mple	e Ty	ype:	D								
Sa	mple [Description:	L	ight grey gravelly sandy CLAY																										
Sa	mple [Preparation:	S	ample	e was qu	artere	ed, ov	en drie	ed at	108.	1 °C a	and	broke	n d	nwok	i by h	anc	1.												-
		CLAY	Tino	SILT			r00	- Eir		SAND			Cooro		-	Fine		<u>GR</u>	<u>AVEL</u>		`ooro	~	со	BBLE	ES	B	BOULE	ERS		
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	90																													
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%	60																													
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ase	50								+											+		_		\square		-	+	+		
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rcei	00																													
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		75	+	100					+				-				Gra	idin	a Ana	alvsi	s									
		63			100				\neg				-		D1(00						mm					28			

Grading Analy	/sis	
D100	mm	28
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		N/A
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Remarks:

50

37.5

28

20

14

10

6.3

5

3.35 2

1.18

0.6

0.425

0.3

0.212

0.15

0.063

100

100

100

95

91

85

81

79 77

75

72

70

69

69

68

66

61 Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Signed:

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

Katasyna Koziej



DETERMINATION OF PARTICLE SIZE DISTRIBUTION Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Clie	ent:			Jomas A	ssociate	es Ltd				Client Reference: JJ2609							
Clie	ent Ad	ldress:	 :	_akeside Stockley	House, Park, U	1 Furze B11 1BD	ground Wa	ıy,			Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022						
Cor	ntact:		-	Fom Elbo	ourne							Date R	Tested: 20	/09/2022			
Site	Addı	ress:		Zone 5 &	ESA H	arwell Ca	ampus Did	cot OX11 0F	D			Sam	pled By: No	t Given			
Tes	stina c	arried out	tati2	Analvtica	al Limite	d. ul. Pio	nierow 39.	41-711 Ruc	- la Slaska.	Poland		Cam	piou D)				
Te	st Re	sults:					,		,								
Lab	orato	rv Referei	nce: 2	2434489		Top [m]: 1.2	on [m]· 1.20										
Hol	e No.		-	ГРЗ		ase [m]: No	se [m]: Not Given										
Sar	nnle F	Reference	. I	Not Give	Given Sample Type: D												
Sample Description: Light					wn sanc	lv verv ar	avellv CLA	Υ				Camp	le i jpei				
Sar	nple F	Preparatio	on:	Sample v	vas qua	rtered, ov	ven dried a	it 107.9 °C a	ind brokei	down by ha	ind.						
	• •			SI	LT .			SAND			GRAVEL	-		BOUIDERS			
		CLAY	Fine	Med	dium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COBBLES	BOOLDERS			
	100											7					
	90											/					
	80																
%	70																
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	0.0	001		0.0	1		0.1	Pa	ticle Size	mm	10		100		1000		
			Siev	ing		Π	Sedime	entation		Sa	mple Propo	rtions		% dry mass			
	Pa	rticlo Sizo	mm	% Pag	ssina	Particle	Sizo mm	% Passi	na	Very coar	se			0			
	١a		;	70 T da	sang		5020 11111	/01 0331	ng	Gravel				30			
		500		10	0	 				Sand				14			
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	_	75		10	00						Frading Ana	lysis					
		63		10	00					D100	0	- mn	n	28			
	50			10	0					D60		mm 0.11					
		37.5	10	00		D30					mn	n					

D100	mm	28
D60	mm	0.11
D30	mm	
D10	mm	
Uniformity Coefficient		> 1.8
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

56 Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

100

91

87

81

77

75

73

70

68

67

66

65

64

62

Remarks:

28

20

14

10

6.3

5

3.35

2

1.18

0.6

0.425

0.3

0.212

0.15

0.063

Signed:

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Katasyna Koziej

Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd



DETERMINATION OF PARTICLE SIZE DISTRIBUTION Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:				Jomas Associa	ates Ltd			Client Reference: JJ2609									
Clie	ent Ad	dress:	 :	_akeside Hous Stockley Park,	se, 1 Furzeç UB11 1BD	ground Wa	у,				Job N Date Sa Date Re	lumber: 22- ampled: No eceived: 20/	-85862 t Given /09/2022				
Cor	ntact:		-	Tom Elbourne							Date	Tested: 27	/09/2022				
Site	e Addr	ess:	2	Zone 5 & ESA	Harwell Ca	mpus Dido	ot OX11 0F	D			Samp	oled By: No	t Given				
Tes	sting c	arried ou	ıt at i2 .	Analytical Lim	ited, ul. Piol	nierow 39,	41-711 Rud	a Slaska, I	Poland								
Tes	st Re	sults:															
Lab	orato	ry Refere	ence: 2	2434504		Depth T	op [m]: 2.0	0									
Hol	e No.:		١	NS6	ase [m]: No	t Given											
Sar	Sample Reference:			lot Given Sample Type: D													
Sample Description:			on: I	ght grey slightly sandy CLAY													
Sar	nple F	Preparati	on: 🕄	Sample was q	uartered, ov	en dried a	t 106.3 °C a	nd broken	down by ha	and.							
				SILT			SAND			GRAVEL		COBBLES	BOULDERS				
	100		Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse						
	100																
	90																
	80																
	70																
%																	
ing	60																
ass	50			+++++													
e D	40																
itag	30																
.cer	50																
Per	20																
	10																
	0																
	0.0	001		0.01		0.1	Par	ticle Size	mm	10		100	100	0			
			Siev	ing		Sedime	ntation		Sa	mple Propo	rtions		% dry mass				
	Pa	rticle Size	e mm	% Passing	Particle	Size mm	% Passir	na	Very coar	se			0				
			•	, e : accg		0.20	,e : ace.	.9	Gravel			_	0	_			
	500	500		100					Sand				8				
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	-	90		100													

Grading Analys	is	
D100	mm	5
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		N/A
Curvature Coefficient		

Uniformity Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Remarks:

75

63

50

37.5

28

20

14

10

6.3

5

3.35

2

1.18

0.6

0.425

0.3

0.212 0.15

0.063

100

100

100

100

100

100

100

100

100

100

100

100

100

99

98

98 97

97

92 Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Signed:

Katasyna Koziej

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Katarzyna Koziel Technical Reviewer for and on behalf of i2 Analytical Ltd

METHOD FOR SATURATION MOISTURE CONTENT OF CHALK

Tested in Accordance with: BS 1377-2: 1990: Clause 3.3

i2 Analytical Ltd Unit 8 Harrowden Road **Brackmills Industrial Estate** Northampton NN4 7EB



Client Reference: JJ2609 Job Number: 22-85862 Date Sampled: Not Given Date Received: 20/09/2022 Date Tested: 27/09/2022 Sampled By: Not Given



4041 Client:

Jomas Associates Ltd

Client Address:

Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

Tom Elbourne Contact: Site Address: Zone 5 & ESA Harwell Campus Didcot OX11 0FD Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

		Sample												
Laboratory Reference	Hole No.	Reference	Depth Top	Depth Base	Туре	Description	Remarks	SMC	Bulk density	Dry density	мс	Preparation		
			m	m				%	Mg/m3	Mg/m3	%			
2434480	BH3	Not Given	3.00	Not Given	D	Light grey slightly sandy CLAY	Supplied lump of chalk fails to comply with volume requirements as per BS1377:2 Clause 3.3.5.1	30	1.87	1.49	25			
2434483	BH5	Not Given	1.00	Not Given	D	Light grey slightly sandy CLAY	Supplied lump of chalk fails to comply with volume requirements as per BS1377:2 Clause 3.3.5.1	30	1.87	1.50	25			
2434491	TP5	Not Given	1.20	Not Given	D	Light grey slightly gravelly sandy CLAY	Supplied lump of chalk fails to comply with volume requirements as per BS1377:2 Clause 3.3.5.1	26	1.90	1.59	20			
2434494	TP8	Not Given	2.40	Not Given	D	Light grey sandy CLAY	Supplied lump of chalk fails to comply with volume requirements as per BS1377:2 Clause 3.3.5.1	25	1.99	1.62	22			

Note: SMC - Saturation Moisture Content; MC - Moisture Content

Comments:

Signed:

Kata Dyna Koziej

Katarzyna Koziel **Technical Reviewer** for and on behalf of i2 Analytical Ltd

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Sample Reference:

Sample Description:

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Jomas Associates Ltd Client Reference: JJ2609 Client: **Client Address:** Job Number: 22-86251 Lakeside House, 1 Furzeground Way, Date Sampled: 15/09/2022 Stockley Park, UB11 1BD Date Received: 20/09/2022 Tom Elbourne Contact: Site Address: Zone 5 & ESA Harwell Campus, Ditcot OX11 0FD Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland **Test Results:** Laboratory Reference: 2436932 BH1 Hole No .:

Brown slightly gravelly CLAY with fragments of roots

Date Tested: 03/10/2022 Sampled By: Not Given

Depth Top [m]: 1.00 Depth Base [m]: Not Given Sample Type: D

Sample Preparation: Tested after washing to remove >425um

Not Given

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
24	67	32	35	79



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed: Dudaińską

Anna Dudzinska PL Deputy Head of Reporting Team for and on behalf of i2 Analytical Ltd

Auna



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client:	Jomas Associates Ltd	Client Reference: JJ2609
Client Address:	Lebeside Lleves A Fureerround Mary	Job Number: 22-86251
	Lakeside House, 1 Furzeground Way, Stocklov Park, LIB11 1PD	Date Sampled: 15/09/2022
	Slockley Faik, OBTT TOD	Date Received: 20/09/2022
Contact:	Tom Elbourne	Date Tested: 03/10/2022
Site Address:	Zone 5 & ESA Harwell Campus, Ditcot OX11 0FD	Sampled By: Not Given
Testing carried out at iz	2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland	
Test Results:		
Laboratory Reference:	2436933	Depth Top [m]: 4.00
Hole No.:	BH1	Depth Base [m]: Not Given
Sample Reference:	Not Given	Sample Type: D
Sample Description:	White CHALK	

Sample Preparation: Tested in natural condition

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
24	35	19	16	100



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed: Duakaińska

Anna Dudzinska PL Deputy Head of Reporting Team for and on behalf of i2 Analytical Ltd

Auna



DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with:BS 1377-2:1990:Clause 4.3 and 5

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Jomas Associates Ltd Client Reference: JJ2609 Client: **Client Address:** Job Number: 22-86251 Lakeside House, 1 Furzeground Way, Date Sampled: 15/09/2022 Stockley Park, UB11 1BD Date Received: 20/09/2022 Tom Elbourne Contact: Date Tested: 03/10/2022 Site Address: Zone 5 & ESA Harwell Campus, Ditcot OX11 0FD Sampled By: Not Given Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland **Test Results:**

Laboratory Reference: 2436935 TP13 Hole No .: Sample Reference: Not Given Brown gravelly CLAY Sample Description:

Sample Preparation: Tested after washing to remove >425um

Depth Top [m]: 1.00 Depth Base [m]: Not Given Sample Type: D

As Received Water	Liquid Limit	Plastic Limit	Plasticity Index	% Passing 425µm
Content [W] %	[WL] %	[Wp] %	[lp] %	BS Test Sieve
23	87	39	48	42



Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed: Dudaińską

Anna Dudzinska PL Deputy Head of Reporting Team for and on behalf of i2 Analytical Ltd

Auna

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client Reference: JJ2609 Job Number: 22-86251 Date Sampled: 15/09/2022 Date Received: 20/09/2022 Date Tested: 03/10/2022 Sampled By: Not Given

Jomas Associates Ltd Client Address: Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

Water Content by BS 1377-2:1990: Clause 3.2; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

Tom Elbourne Contact: Site Address: Zone 5 & ESA Harwell Campus, Ditcot OX11 0FD Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

TESTING

4041

Client:

	Sample				tent W]	tent '892-2	7, Atterberg		rberg			Density		#					
Laboratory Reference	Hole No.	Reference	Depth Top	Depth Base	Туре	Description	Remarks	Water Con BS 1377-2 [Water Con BS EN ISO 17 [W]	% Passing 425um	WL	Wp	lp	bulk	dry	PD	T otal Porosity		
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
2436932	BH1	Not Given	1.00	Not Given	D	Brown slightly gravelly CLAY with fragments of roots	Atterberg 4 Point	24		79	67	32	35						
2436933	BH1	Not Given	4.00	Not Given	D	White CHALK	Atterberg 4 Point	24		100	35	19	16						
2436935	TP13	Not Given	1.00	Not Given	D	Brown gravelly CLAY	Atterberg 4 Point	23		42	87	39	48						

Note: # Non accredited; NP - Non plastic

Comments:

Signed: Dudiainska Anna

Anna Dudzinska PL Deputy Head of Reporting Team for and on behalf of i2 Analytical Ltd

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DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd Unit 8 Harrowden Road Brackmills Industrial Estate Northampton NN4 7EB



Client Reference: JJ2609 Job Number: 22-86251 Date Sampled: 15/09/2022 Date Received: 20/09/2022 Date Tested: 03/10/2022 Sampled By: Not Given



4041 Client:

Jomas Associates Ltd

Client Address:

Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD

Contact:	Tom Elbourne
Site Address:	Zone 5 & ESA Harwell Campus, Ditcot OX11 0FD
Testing carried out at	i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

			Sample	e							
Laboratory Reference	Hole No.	Reference	Depth Top m	Depth Base m	Туре	Description	Remarks	wc %	Sample preparation / Oven temperature at the time of testing		
2436932	BH1	Not Given	1.00	Not Given	D	Brown slightly gravelly CLAY with fragments of roots		24	Sample was quartered, oven dried at 107.7 °C	[
2436933	BH1	Not Given	4.00	Not Given	D	White CHALK		24	Sample was quartered, oven dried at 107.7 °C		
2436935	TP13	Not Given	1.00	Not Given	D	Brown gravelly CLAY		23	Sample was quartered, oven dried at 107.7 °C		

Comments:

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Anna Dudzinska PL Deputy Head of Reporting Team for and on behalf of i2 Analytical Ltd

Page 1 of 1

METHOD FOR SATURATION MOISTURE CONTENT OF CHALK

Tested in Accordance with: BS 1377-2: 1990: Clause 3.3

i2 Analytical Ltd Unit 8 Harrowden Road **Brackmills Industrial Estate** Northampton NN4 7EB



Client Reference: JJ2609 Job Number: 22-86251 Date Sampled: 15/09/2022 Date Received: 20/09/2022 Date Tested: 11/10/2022 Sampled By: Not Given



4041 Client:

Jomas Associates Ltd

Stockley Park, UB11 1BD

Client Address:

Lakeside House, 1 Furzeground Way,

Tom Elbourne Contact: Site Address: Zone 5 & ESA Harwell Campus, Ditcot OX11 0FD Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

			Sample	2				Bulk				
Laboratory Reference	Hole No.	Reference	Depth Top	Depth Base	Туре	Description	Remarks	SMC	Bulk density	Dry density	мс	Preparation
			m	m				%	Mg/m3	Mg/m3	%	
2436933	BH1	Not Given	4.00	Not Given	D	White CHALK	Supplied lump of chalk fails to comply with volume requirements as per BS1377:2 Clause 3.3.5.1	27	1.94	1.57	24	

Note: SMC - Saturation Moisture Content; MC - Moisture Content

Comments:

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Signed:



Anna Dudzinska PL Deputy Head of Reporting Team for and on behalf of i2 Analytical Ltd



APPENDIX 5 – SOIL GAS MONITORING RESULTS

	GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET													
Site: Zone 5 & ESA Harwell Campus	Operative(s): RAY	Date: 21/09/2022	Time: 12:15		Round: 1		Page: 1							
			IPMENT											
Instrument Type Instrument Make Serial No. Date Last Calibrated														
Analox	GA5000		G505801		01/10/2021									
PID	Phocheck tiger		T-106448		01/03/2021									
Dip Meter	GeoTech													
		MONITORING CON	DITIONS											
Weather Conditions: Overcast	Gro	und Conditions: Dry	Temperature: 19°C											
Barometric Pressure (mbar): 101	12 Bar	ometric Pressure Trend (24hr)	d (24hr): Falling Ambient Concentration: 0.3 %CH ₄ , 0.1 %CO ₂ , 21.0 ⁴											

	MONITORING RESULTS														
Monitoring	F	low	Atmospheric					voc	(ppm)		60	Depth to	Depth to	Depth to	
Point Location	Peak	Steady	Pressure (mbar)	CH₄ %	LEL	CO ₂ %	O ₂ %	Peak	Steady	⊓₂5 (ppm)	(ppm)	product (mbgl)	water (mbgl)	of well (mbgl)	
BH1	+0.3	+0.3	1012	0.2	-	0.8	20.2	0.0	0.0	0	1	-	DRY	7.90	
BH2	+0.2	+0.2	1013	0.1	-	0.3	20.1	0.0	0.0	0	1	-	DRY	6.70	
BH3	+0.2	+0.2	1012	0.1	-	0.8	20.2	0.0	0.0	0	1	-	DRY	5.88	
BH4	+0.2	+0.2	1012	0.1	-	0.3	20.2	0.0	0.0	0	9	-	DRY	5.32	
BH5	+0.2	+0.2	1011	0.0	-	0.9	20.4	0.0	0.0	0	1	-	DRY	4.41	
BH6	+0.1	+0.1	1012	0.0	-	0.0	20.1	0.0	0.0	0	0	-	DRY	4.40	
BH7	+0.2	+0.2	1012	0.0	-	0.6	20.2	0.0	0.0	0	2	-	DRY	4.43	

GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET													
Site: Zone 5 & ESA Harwell Campus	Operative(s): RAY	Date: 21/09/2022	2	Time: 12:15		Round: 1	Page: 2						
	-	MONITORIN	IG EQU	IPMENT		-							
Instrument Type	Instrument Make			Serial No.		Date Last Calibrated							
Analox	G505801		01/10/2021										
PID	Phocheck tiger			T-106448		01/03/2021							
Dip Meter	GeoTech												
		MONITORIN	G CON	DITIONS									
Weather Conditions: OvercastGround Conditions: DryTemperature:19°C													
Barometric Pressure (mbar): 101	2	Barometric Pressure Tren	Irend (24hr): Falling Ambient Concentration: 0.3 %CH4, 0.1 %CO2,					1.0%O2					

	MONITORING RESULTS														
Monitoring	F	low	Atmospheric					voc	(ppm)		60	Depth to	Depth to	Depth to	
Point Location	Peak	Steady	Pressure (mbar)	CH₄ %	LEL	CO2 %	O2 %	Peak	Steady	п₂5 (ppm)	(ppm)	product (mbgl)	water (mbgl)	of well (mbgl)	
WS2	+0.2	+0.2	1013	0.2	-	0.9	20.2	0.0	0.0	0	1	-	DRY	1.76	
WS5	+0.2	+0.2	1012	0.1	-	2.3	19.5	0.0	0.0	0	1	-	DRY	1.91	
WS7	+0.3	+0.3	1012	0.0	-	0.9	20.5	0.0	0.0	0	1	-	DRY	1.75	
WS8	+0.2	+0.2	1012	0.0	-	0.0	20.7	0.0	0.0	0	1	-	DRY	0.73	

GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET													
Site: Zone 5 & ESA Harwell Campus	Operative(s): EEG	Date: 21/09/2022	Time: 12:15		Round: 2		Page: 1						
			IPMENT										
Instrument Type	Instrument Make		Serial No.		Date Last Calib	rated							
Analox	GA5000		G505801		01/10/2021								
PID	Phocheck tiger		T-106448		01/03/2021								
Dip Meter	GeoTech												
			DITIONS										
Weather Conditions: Sunny with in showers	ntermittent heavy Gro	ound Conditions: Wet		Tempera	ature:	14°C							
Barometric Pressure (mbar): 987	Bar	rometric Pressure Trend (24hr)	: Falling	Ambien	t Concentration:	0.0 %CH4	, 0.2 %CO ₂ , 21.	.0 %O ₂					

	MONITORING RESULTS														
Monitoring	F	low	Atmospheric					voc	(ppm)			Depth to	Depth to	Depth to	
Point Location	Peak	Steady	Pressure (mbar)	CH₄ %	LEL	CO ₂ %	O ₂ %	Peak	Steady	H₂S (ppm)	(ppm)	product (mbgl)	water (mbgl)	base of well (mbgl)	
BH1	+0.0	+0.0	987	0.0	-	1.1	20.0	0.0	0.0	0	0	-	DRY	7.84	
BH2	+0.1	+0.1	988	0.0	-	0.3	21.3	0.0	0.0	0	0	-	DRY	6.63	
BH3	+0.0	+0.0	988	0.0	-	0.8	20.7	1.0	0.0	0	0	-	DRY	4.84	
BH4	+0.0	+0.0	998	0.0	-	0.4	20.5	0.0	0.0	0	2	-	DRY	5.30	
BH5*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH6	+0.1	+0.1	987	0.0	-	0.0	19.9	0.0	0.0	1	1	-	DRY	4.37	
BH7	+0.2	+0.2	987	0.0	-	1.3	19.8	0.0	0.0	0	0	-	DRY	4.42	

GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET												
Site: Zone 5 & ESA Harwell Campus	Operative(s): EEG	Date: 27/09/2022	Time: 12:15pm		Round: 2	Page: 2						
	MONITORING EQUIPMENT											
Instrument Type Instrument Make Serial No. Date Last Calibrated												
Analox												
PID	Phocheck tiger		T-106448		01/03/2021							
Dip Meter	GeoTech											
			DITIONS		<u> </u>							
Weather Conditions: Sunny with in showers	ntermittent heavy Grou	nd Conditions: Wet		Temper	ature: 14°C							
Barometric Pressure (mbar): 987 Barometric Pressure Trend (24hr): Falling Ambient Concentration: 0.1 %CH4, 1.3 %CO2, 19.9 %O2												

	MONITORING RESULTS														
Monitoring	F	low	Atmospheric					voc	(ppm)	Це	60	Depth to	Depth to	Depth to	
Point Location	Peak	Steady	Pressure (mbar)	CH₄ %	LEL	CO2 %	O ₂ %	Peak	Steady	п₂5 (ppm)	(ppm)	product (mbgl)	water (mbgl)	of well (mbgl)	
WS2	+0.1	+0.1	988	0.0	-	0.6	21.8	0.0	0.0	0	0	-	DRY	1.71	
WS5	+0.0	+0.0	987	0.0	-	1.7	19.2	0.0	0.0	0	0	-	DRY	1.90	
WS7*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WS8	+0.2	+0.1	988	0.0	-	0.1	20.8	0.0	0.0	0	1	-	DRY	0.70	

*Monitoring wells BH5 and WS7 removed on 21/09/2022.

GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET												
Site: Zone 5 & ESA Harwell Campus	Operative(s): JAR	Date: 05/10/2022	Time: 9:30		Round: 3	Page: 1						
	MONITORING EQUIPMENT											
Instrument Type	Instrument Type Instrument Make Serial No. Date Last Calibrated											
Analox GA5000 G505801 01/10/2021												
PID	Phocheck tiger		T-106448		01/03/2021							
Dip Meter	GeoTech											
			DITIONS									
Weather Conditions: Sunny with in	ntermittent showers Gro	und Conditions: Wet		Temper	ature: 15°C							
Barometric Pressure (mbar): 993 Barometric Pressure Trend (24hr): Falling Ambient Concentration: 0.2 %CH4, 0.1 %CO2, 20.6 %O2												

						ΜΟΝΙΤΟ	ORING RESU	JLTS						
Monitoring	F	low	Atmospheric					voc	(ppm)		60	Depth to	Depth to	Depth to
Point Location	Peak	Steady	Pressure (mbar)	CH₄ %	LEL	CO ₂ %	O ₂ %	Peak	Steady	⊓₂5 (ppm)	(ppm)	product (mbgl)	water (mbgl)	of well (mbgl)
BH1	0.1	0.1	993	0.1	-	1.6	19.2	0.1	0.1	0	0	-	DRY	7.85
BH2	0.2	0.2	993	0.1	-	0.1	20.5	0.2	0	0	0	-	DRY	6.65
BH3	0	0	993	0.1	-	0.8	20.2	0.1	0.1	0	0	-	DRY	5.8
BH4	0	0	993	0.2	-	0.1	20.9	0	0	0	0	-	DRY	5.30
BH5*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	0.1	0.1	993	0.1	-	0	20.7	0.3	0.1	0	0	-	DRY	4.4
BH7	0.1	0.1	993	0.1	-	1.3	19.90	0.2	0	0	0	-	DRY	4.3

	GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET												
Site: Zone 5 & ESA Harwell Campus	Operative(s): JAR	Date: 05/10/2022	Time: 9:30		Round: 3	Page: 2							
	MONITORING EQUIPMENT												
Instrument Type	Instrument Type Instrument Make Serial No. Date Last Calibrated												
Analox GA5000 G505801 01/10/2021													
PID	Phocheck tiger		T-106448		01/03/2021								
Dip Meter	GeoTech												
			DITIONS										
Weather Conditions: Sunny with i	intermittent showers Gro	und Conditions: Wet		Temper	ature: 15°C								
Barometric Pressure (mbar): 993 Barometric Pressure Trend (24hr): Falling Ambient Concentration: 0.2 %CH4, 0.1 %CO2, 20.6 %O2													

	MONITORING RESULTS														
Monitoring	F	low	Atmospheric					voc	(ppm)	ЦС	CO	Depth to	Depth to	Depth to	
Point Location	Peak	Steady	Pressure (mbar)	CH₄ %	LEL	CO2 %	O ₂ %	Peak	H2S CO Dopting to ik Steady (ppm) (ppm) (mbgl)		of well (mbgl)				
WS2	0.1	0.1	993	0.2	-	0.9	20.5	0.4	0.2	0	0	-	DRY	1.75	
WS5	0.2	0.2	993	0.1	-	1.4	20.0	0.2	0.1	0	0	-	DRY	1.90	
WS7*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WS8	0.1	0.1	993	0.2	-	0.1	20.9	0	0	0	0	-	DRY	0.70	

*Monitoring wells BH5 and WS7 removed on 21/09/2022.

	GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET												
Site: Zone 5 & ESA Harwell Campus	Operative(s): EEG	Date: 12/10/2022	Time: 9:50		Round: 4	Page: 1							
			IPMENT										
Instrument Type Instrument Make Serial No. Date Last Calibrated													
Analox		01/10/2021											
PID	Phocheck tiger		T-106448		01/03/2021								
Dip Meter	GeoTech												
			DITIONS										
Weather Conditions: Sunny	Grour	d Conditions: Damp		Temper	ature: 10°C								
Barometric Pressure (mbar): 1008 Barometric Pressure Trend (24hr): Rising Ambient Concentration: 0.2 %CH4, 0.1 %CO2, 20.8 %O2													

						ΜΟΝΙΤΟ	DRING RESU	JLTS						
Monitoring	F	low	Atmospheric					voc	(ppm)		60	Depth to	Depth to	Depth to
Point Location	Peak	Steady	Pressure (mbar)	CH₄ %	LEL	CO ₂ %	O ₂ %	Peak	Steady	⊓₂5 (ppm)	(ppm)	product (mbgl)	water (mbgl)	of well (mbgl)
BH1	-0.5	-0.3	1007	0.1	-	1.3	19.9	0.3	0.2	0	0	-	DRY	7.88
BH2	-0.1	-0.1	1008	0.1	-	0.2	20.4	0.3	0.3	0	0	-	DRY	6.67
BH3	-0.0	-0.0	1008	0.1	-	0.7	20.7	0.2	0.1	0	0	-	DRY	5.88
BH4	+0.1	+0.1	1008	0.1	-	0.3	20.6	0.3	0.2	0	0	-	DRY	5.32
BH5*	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	+0.0	+0.0	1008	0.1	-	0.0	20.4	0.1	0.0	0	4	-	DRY	4.41
BH7	+0.0	+0.0	1008	0.1	-	0.8	20.5	13.5	10.1	0	0	-	DRY	4.43

	GAS AND GROUNDWATER MONITORING BOREHOLE RECORD SHEET											
Site: Zone 5 & ESA Harwell Campus	Operative(s): EEG	Date: 12/10/2022	Time: 9:50		Round: 4	Page: 2						
			IPMENT									
Instrument Type Instrument Make Serial No. Date Last Calibrated												
Analox	01/10/2021											
PID	Phocheck tiger		T-106448		01/03/2021							
Dip Meter	GeoTech											
		MONITORING CON	DITIONS									
Weather Conditions: Sunny	Grour	d Conditions: Damp		Temper	ature: 10°C							
Barometric Pressure (mbar): 1008 Barometric Pressure Trend (24hr): Rising Ambient Concentration: 0.2 %CH4, 0.1 %CO2, 20.8 %O2						4, 0.1 %CO ₂ , 20.8 %O ₂						

	MONITORING RESULTS														
Monitoring	F	low	Atmospheric					voc	(ppm)	ЦС	<u> </u>	Depth to	Depth to	Depth to	
Point Location	Peak	Steady	Pressure (mbar)	CH₄ %	LEL	CO2 %	O ₂ %	Peak	Steady	п₂5 (ppm)	(ppm)	product (mbgl)	oduct water nbgl) (mbgl)		
WS2	+0.0	+0.0	1009	0.1	-	0.8	20.3	0.3	0.3	0	0	-	DRY	1.77	
WS5	-0.1	-0.1	1007	0.1	-	0.7	20.8	0.2	0.2	0	0	-	DRY	1.93	
WS7*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WS8	+0.0	+0.0	1008	0.1	-	0.1	20.8	0.4	0.2	0	0	-	DRY	0.74	

*Monitoring wells BH5 and WS7 removed on 21/09/2022.



APPENDIX 6 – SOIL INFILTRATION TEST RECORDS























APPENDIX 7 – CBR TEST RESULTS

Jomas	Job:	Zone	5 & ESA Harwell C	ampus		Test Loca	ation:	CBR1	000
Jomas	JOD NO	0.: P439	7J2609			Date of To	est:	13/09/2	022
Depth (mm) 50	Nr Blow 0	Cumulative blows	Calculati	ng Engineer: Approved by:	EEG SC	Date: Date:	21/09 23/09	/2022 /2022	
150 200 250	0 0 10	0 0 10	Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBR IAN 73/06	R (%) TRL 587	E (MPa)
300 350 400 450	8 3 2 2	18 21 23 25	CBR1-Test 1 CBR1-Test 2 CBR1-Test 3	200 300 500	300 500 950	5.6 22.2 50.0	49.3 11.4 4.8	46.0 11.8 5.3	213.27 83.55 48.03
430 500 550 600 650 700 750 800 850 900 950 1000	2 1 1 1 1 1 1 1 1	23 27 28 29 30 31 32 33 34 35 36	Test Notes: Test carried out us free fall hammer lif Colour of text refer CBR's calculated u Characteristic MCS	ing a TRL Dyna ted and droppe s to the modell using methodolo % ?	amic Cone F ed through a ed gradient oies outlined N	Penetromete height of 5 on graph be d in IAN 73/	er consis 75mm. elow. 06 and ir	ting of a דRL 58	8 kg 37.



Jomas Jomas	Job: Job No	Zone o.: P439	5 & ESA Harwell C 7J2609	ampus		Test Loca Date of Te	ition: est:	CBR2 12/09/2	022
Depth (mm) 50 100	Nr Blow 0 0	Cumulative blows 0 0	Calculati	ng Engineer: Approved by:	EEG SC	Date: Date:	21/09 23/09	/2022 /2022	
150 200 250	2 4 3	2 6 9	Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBR IAN 73/06	(%) TRL 587	E (MPa)
300 350 400 450	2 5 6 6	11 16 22 28	CBR2-Test 1 CBR2-Test 2 CBR2-Test 3 CBR2-Test 4	50 300 650 850	300 650 850 900	22.7 9.2 3.2 1.0	11.1 28.9 87.6 302	11.6 28.0 78.4 247	82.13 151.53 308.12 680.33
500 550 600 650	7 4 5 5	35 39 44 49	Test Notes: Test carried out us free fall hammer lif	ing a TRL Dyna ted and droppe	amic Cone F ed through a	Penetromete	er consis 75mm.	ting of a	8 kg
700 750 800 850 900 950	10 18 16 18 50	59 77 93 111 161	Colour of text refer CBR's calculated u Characteristic MCS	s to the modell Ising methodolo % ?	ed gradient oies outlined N	on graph be I in IAN 73/0	elow. 06 and ir	1 TRL 58	37.
1000									



Jomas Job: Zo		Zone	e 5 & ESA Harwell Campus			Test Location: CB		CBR3	
Jomas Job No.: P439			7J2609			Date of Test:		12/09/2022	
Depth (mm) 50 100	Nr Blow 1 1	Cumulative blows 1 2	Calculating Engineer: EEG Approved by: SC			Calculating Engineer: EEGDate:21/09/20Approved by: SCDate:23/09/20)/2022)/2022	
150	2	4		Initial Depth	Final	mm /	CBR	R (%)	
200 250	3	7 10	Test	(mm)	Depth (mm)	blow	IAN 73/06	1 RL 587	E (MPa)
300	3	13	CBR3-Test 1	50	300	20.8	12.2	12.6	87.25
350	3	16	CBR3-Test 2	350	600	13.9	18.7	18.7	114.68
400	6	22	CBR3-Test 3	600	750	6.3	43.5	41.0	196.85
450	3	25	CBR3-Test 4	750	950	7.7	34.9	33.4	170.97
500	3	28							
550	3	31	Test Notes:						
600	3	34	Test carried out us	ing a TRL Dyna	amic Cone F	Penetromete	er consis	ting of a	1 8 kg
650	4	38	free fall hammer lif	ted and droppe	ed through a	height of 5	75mm.		
700	10	48	Colour of toxt refer	a ta tha madall	ad gradient	an granh h			
750	10	58	Colour of text relef	s to the modeli	ed gradient	on graph be	elow.		
800	9	67	CBR's calculated u	ising methodol	oies outlined	l in IAN 73/	06 and ir	n TRL 58	37.
850	7	74	Characteristic MC%	6?	N				
900	5	79							
950	5	84							
1000	6	90							



Jomas Job: Zone			5 & ESA Harwell Campus			Test Location:		CBR4			
Jomas Job No.: P439			17J2609			Date of Test:		12/09/2022			
Depth (mm) 50 100	Nr Blow 1 3	Cumulative blows 1 4	Calculating Engineer: EEG Approved by: SC			Date: Date:	21/09/2022 23/09/2022				
150 200 250	4 2 3	8 10 13	Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBF IAN 73/06	R (%) TRL 587	E (MPa)		
300	2	15	CBR4-Test 1	50	150	14.3	18.2	18.2	112.71		
350	2	17	CBR4-Test 2	150	400	22.7	11.1	11.6	82.13		
400	2	19	CBR4-Test 3	450	750	7.1	37.8	36.0	179.93		
450	4	23	CBR4-Test 4	800	900	8.3	32.1	30.9	162.06		
500	10	33	Test Notes: Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm								
550	8	41									
600	7	48									
650	6	54									
700 750 800 850 900 950 1000	6 3 6 6	65 68 74 80	Colour of text refer CBR's calculated u Characteristic MCS	s to the modell Ising methodol % ?	ed gradient oies outlined N	on graph bo d in IAN 73/	elow. 06 and ir	n TRL 58	37.		



Jomas Job: Zone		5 & ESA Harwell Campus			Test Location:		CBR5				
Jomas Job No.: P4397			7J2609			Date of Test:		13/09/2022			
Depth (mm) 50 100	Nr Blow 1 2	Cumulative blows 1 3	Calculating Engineer: EEG Approved by: SC			Calculating Engineer: EEGDate:21/09/Approved by:SCDate:23/09/		Date: 21/ Date: 23/		/2022 /2022	
150	2	5	Teet	Initial Depth	Final	mm /	CBR	R (%)			
200 250	3	8 10	Test	(mm)	Depth (mm)	blow	73/06	587	E (MPa)		
300	4	14	CBR5-Test 1	50	250	22.2	11.4	11.8	83.55		
350	4	18	CBR5-Test 2	250	400	13.6	19.1	19.1	116.24		
400	3	21	CBR5-Test 3	400	600	11.8	22.3	22.1	128.36		
450	4	25	CBR5-Test 4	600	950	5.2	52.6	48.9	222.3		
500	3	28									
550	4	32	Test Notes:								
600	6	38	Test carried out us	ing a TRL Dyn	amic Cone F	Penetromete	er consis	ting of a	i 8 kg		
650	8	46	free fall hammer lif	ted and droppe	ed through a	height of 5	75mm.				
700	10	56	Colour of toxt rofor	r to the model	lod gradient	on graph by					
750	10	66		s to the model	ieu graulerit	on graph be	510 W.				
800	10	76	CBR's calculated u	ising methodol	oies outlined	l in IAN 73/	06 and ir	n TRL 58	37.		
850	10	86	Characteristic MC%	%?	N						
900	11	97									
950	8	105									
1000											



Jomas Jomas	Job: Job No	Zone o.: P439	5 & ESA Harwell Campus 7J2609			Test Location: Date of Test:		CBR6 13/09/2022		
Depth (mm) 50 100	Nr Blow 1 1	Cumulative blows 1 2	Calculating Engineer: EEG Approved by: SC			Date: Date:	21/09/2022 23/09/2022			
150 200 250	1 2 4	3 5 9	Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBF IAN 73/06	R (%) TRL 587	E (MPa)	
300 350 400 450	3 3 3 4	12 15 18 22	CBR6-Test 1 CBR6-Test 2	50 200	200 950	37.5 14.4	6.6 18	7.1 18.1	58.89 111.91	
500 550 600 650 700 750 800 850	3 4 3 4 3 5 4 3	25 29 32 36 39 44 48 51	Test Notes: Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm. Colour of text refers to the modelled gradient on graph below. CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587. Characteristic MC% 2 N							
900 950 1000	3 3	54 57								



Jomas Job: Zone			5 & ESA Harwell Campus			Test Location: CBR7			
Jomas	Job No	b.: P439	7J2609			Date of Test:		12/09/2022	
Depth (mm) 50 100	Nr Blow 2 2	Cumulative blows 2 4	Calculating Engineer: EEG Approved by: SC			Date: Date:	21/09 23/09	/2022 /2022	
150	2	6		Initial Depth	Final	mm /	CBR	<u>(%)</u>	
200 250	2	8 10	lest	(mm)	Depth (mm)	blow	1AN 73/06	587	Е (МРа)
300	2	12	CBR7-Test 1	50	400	25.0	10.1	10.5	77.32
350	2	14	CBR7-Test 2	400	750	8.8	30.5	29.5	156.84
400	2	16	CBR7-Test 3	750	950	6.1	45	42.3	201.17
450	4	20	CBR7-Test 4	400	950	7.5	35.7	34.1	173.47
500	6	26							
550	6	32	Test Notes:						
600	6	38	Test carried out us	ing a TRL Dyna	amic Cone F	Penetromete	er consis	ting of a	8 kg
650	7	45	free fall hammer lif	ted and droppe	ed through a	height of 5	75mm.		
700	5	50	Colour of toxt rofor	s to the modell	od gradiant	on graph by			
750	6	56			eu grauient	on graph be	510 W.		
800	7	63	CBR's calculated u	ising methodol	oies outlined	l in IAN 73/0	06 and ir	1 TRL 58	37.
850	8	71	Characteristic MC%	%?	N				
900	8	79							
950 1000	10	89							



Jomas Job: Zone			5 & ESA Harwell Campus			Test Loca	tion:	CBR8	
Jomas Job No.: P439			7J2609			Date of Test:		12/09/2022	
Depth (mm) 50 100	Nr Blow 1 1	Cumulative blows 1 2	Calculating Engineer: EEG Approved by: SC			Date: Date:	21/09 23/09	/2022 /2022	
150	2	4	Teet	Initial Depth	Final	mm /	CBR	R (%)	
200 250	2	6 9	Test	(mm)	Depth (mm)	blow	TAN 73/06	587	E (MPa)
300	2	11	CBR8-Test 1	100	350	22.7	11.1	11.6	82.13
350	2	13	CBR8-Test 2	350	450	12.5	20.9	20.8	123.14
400	4	17	CBR8-Test 3	450	850	28.6	8.7	9.2	70.28
450	4	21	CBR8-Test 4	850	1000	13.6	19.1	19.1	116.24
500	2	23							
550	1	24	Test Notes:						
600	2	26	Test carried out us	ing a TRL Dyn	amic Cone F	Penetromete	er consis	ting of a	8 kg
650	2	28	free fall hammer lif	ted and droppe	ed through a	height of 5	75mm		
700	2	30							
750	1	31	Colour of text refer	s to the modell	ed gradient	on graph be	elow.		
800	2	33	CBR's calculated u	ising methodol	oies outlined	l in IAN 73/	06 and ir	n TRL 58	37.
850	2	35	Characteristic MC%	%?	N				
900	3	38							
950	4	42							
1000	4	46							



Jomas Job: Zone Jomas Job No.: P439		5 & ESA Harwell Campus 7J2609			Test Location: Date of Test:		CBR9 13/09/2022				
Depth (mm) 50 100	Nr Blow 1 2	Cumulative blows 1 3	Calculating Engineer: EEG Approved by: SC			Date: Date:	21/09/2022 23/09/2022				
150 200 250	3 3 5	6 9 14	Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBF IAN 73/06	R (%) TRL 587	E (MPa)		
300 350 400 450	7 6 6 50	21 27 33 83	CBR9-Test 1 CBR9-Test 2 CBR9-Test 3	50 200 400	200 400 450	18.8 8.3 1.0	13.6 32.1 302	14.0 30.9 247.0	93.54 162.06 680.33		
500 550 600 650			<u>Test Notes:</u> Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm.								
750 800 850 900 950			Colour of text refers to the modelled gradient on graph below. CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587. Characteristic MC% ? N								
1000											


JUMAS ENGINEERING CBR Calculation

Jomas Jomas	Job: Job No	Zone o.: P439	5 & ESA Harwell Campus 17J2609			Test Location: Date of Test:		CBR10 12/09/2022	
Depth (mm) 50 100	Nr Blow 1 1	Cumulative blows 1 2	Calculating Engineer: EEG Approved by: SC			Date: Date:	/2022 /2022		
150 200 250	4 3 4	6 9 13	Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBF IAN 73/06	t (%) TRL 587	E (MPa)
300 350 400 450	7 6 7 8	20 26 33 41	CBR10-Test 1 CBR10-Test 2 CBR10-Test 3	100 250 450	250 450 950	13.6 7.1 9.4	19.1 37.8 28.2	19.1 36.0 27.4	116.24 179.93 149.17
500 550 600 650 700 750 800 850 900 950	6 5 6 6 5 5 5 5 4	47 52 58 64 70 75 80 85 90 94	Test Notes: Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg free fall hammer lifted and dropped through a height of 575mm. Colour of text refers to the modelled gradient on graph below. CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587. Characteristic MC% ? N						



JUMAS ENGINEERING CBR Calculation

Jomas Job: Zone Jomas Job No.: P439			5 & ESA Harwell Campus 07J2609			Test Location: Date of Test:		CBR11 12/09/2022	
Depth (mm) 50 100	Nr Blow 1 1	Cumulative blows 1 2	Calculating Engineer: EEG Approved by: SC			Date: 21/0 Date: 23/0		/2022 /2022	
150 200	3 5	5 10	Test	Initial Depth	Final Depth	mm /		t (%) TRL	E (MPa)
250	7	17		(mm)	(mm)	blow	73/06	587	- (,
300	5	22	CBR11-Test 1	50	150	25.0	10.1	10.5	77.32
350	13	35	CBR11-Test 2	150	300	8.8	30.2	29.2	155.85
400	50	85	CBR11-Test 3	300	350	3.8	72.7	66.0	273.46
450			CBR11-Test 4	350	400	1.0	302	247	680.33
500									
550			Test Notes:						
600			Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg						
650			free fall hammer lifted and dropped through a height of 575mm.						
700			Colour of text refers to the modelled gradient on graph below						
750									
800			CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587.						
850			Characteristic MC%	%?	N				
900									
950									
1000									



JUMAS ENGINEERING CBR Calculation

Jomas Job: Zone			5 & ESA Harwell Campus			Test Location:		CBR12	
Jomas Job No.: P439)7J2609			Date of Test:		12/09/2022		
Depth (mm) 50 100	Nr Blow 0 1	Cumulative blows 0 1	Calculating Engineer: EEG Approved by: SC			Date: 21/0 Date: 23/0		9/2022 9/2022	
150 200 250	1 2 3	2 4 7	Test	Initial Depth (mm)	Final Depth (mm)	mm / blow	CBR IAN 73/06	t (%) TRL 587	E (MPa)
300	4	11	CBR12-Test 1	50	150	50.0	4.8	5.3	48.03
350	3	14	CBR12-Test 2	150	400	16.7	15.4	15.7	101.28
400	3	17	CBR12-Test 3	450	700	22.7	11.1	11.6	82.13
450	5	22	CBR12-Test 4	700	950	13.2	19.8	19.8	118.95
500	3	25							
550	2	27	Test Notes:						
600	2	29	Test carried out using a TRL Dynamic Cone Penetrometer consisting of a 8 kg						
650	2	31	free fall hammer lifted and dropped through a height of 575mm						
700	2	33	Colour of tout refere to the modelled gradient on grant below						
750	3	36	Colour of text refers to the modelled gradient on graph below.						
800	4	40	CBR's calculated using methodoloies outlined in IAN 73/06 and in TRL 587.						
850	5	45	Characteristic MC%	%?	N				
900	3	48							
950	4	52							
1000									



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