enzygo
geo environmental

Geoenvironmental Report

Waitrose, Littlehampton

Cumming Group Limited

SHF.1995.004.GE.R.001.C

'Experience and expertise working in union'

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Geoenvironmental Report

Project:	Waitrose Littlehampton
For:	Cummings Group Limited
Status:	Rev C
Date:	August 2024
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1.0 INTRODUCTION

1.1 Background

1.1.1 Enzygo GeoEnvironmental Limited [Enzygo] has been commissioned by Cummings Group Ltd to undertake a Ground Investigation [GI] and prepare a Geoenvironmental Interpretative Report for a proposed commercial development, located at Avon Rd, Littlehampton BN17 6AT.

1.2 Proposed Development

1.2.1 The proposed development is for a commercial hotel with an associated car park, hard and soft landscaping. A site layout is shown on the Axiom Architects '1st – 4th Floor Plan', [Drawing No. 6122-F2-101 Rev F], dated February 2024, included within Appendix 1.

1.3 Existing Information

1.3.1 Available reporting is presented and summarised below.

1.3.2 Enzygo Ltd, Preliminary Risk Assessment, [Report Ref: SHF.1995.004.GE.R.001], dated July 2024.

- Historically the development site was occupied by residential buildings within the northwest and southern areas if the site, with a road [Field Place Road] within the northern section of the site from 1876. From 1932, a green space within the southeastern section of the site has developed with commercial buildings. From 1957, Avon Road is preset within the southeast and a new engineering works is present to along the western border. From 1987, residential buildings in the south and north have been replaced by commercial buildings and a car park respectively, with further development of Avon Road replacing the engineering works.

- BGS records indicates the site to be underlain by the Raised Beach Deposits [Raised Beach Deposits] and River Terrace deposits [Sand, Silt and Clay], underlaid by Lewes Nodular Chalk Formation [Chalk].

- The site is considered to present a low to moderate potential contamination risk to both construction workers and future site occupants. This is based upon the presence of Made Ground associated with the historic development of the site as well as construction of the current structures.

1.3.3 WDE Consulting 'Summary of Preliminary Findings' [Ref: 21106], dated January 2022.

- Three boreholes with SPT's (BH1-BH3) were drilled on 22nd November 2021, using a mechanically driven window sampler to a maximum depth of 5.00m below existing ground level [begl] within the area of the existing car park.

- Ground conditions typically comprised Made ground to a depth of 0.80m begl, followed by brown clay or sand [River Terrace Deposits] encountered to depths between 1.60 and 3.00m begl. The River Terrace Deposits are then underlaid by the Lewes Nodular Chalk Formation proven to 5.0m begl.

1.4 Objectives

1.4.1 The objectives of the study are to.

- Undertake a ground investigation.
- Provide a factual and interpretative report relating to the desk study and site investigations. Provide a revised conceptual model and recommendations on any potential development issues and mitigation measures, where appropriate, and
- Provide geotechnical recommendations in relation to foundations and infrastructure.

1.5 Risk Classification

1.5.1 Enzygo Geoenvironmental has utilised the available information, together with our experience to assess the likely risks to development from land quality issues. Definitions of the risk terms used are provided on the following table:

Table 1.5.1 Risk Classification

Risk	Description
Dismissed	The risk has been dismissed.
Negligible	No contamination risk has been identified which is likely to affect development.
Low	No significant contaminated land risks have been encountered affecting development and a low risk that remediation will be required.
Low-Moderate	There are unlikely to be significant contaminated land issue associated with the site which will adversely affect its re-development. However, minor or localised contamination may be present requiring remediation. Remediation should be possible under a discovery strategy and with a call out service.
Moderate	Some potential contaminated land risks have been encountered or identified which may affect re-development. The risks identified are unlikely to affect the entire site or preclude development. Remediation is considered feasible as part of the development process and no further investigation is considered necessary.
Moderate-High	Some potentially significant contaminated land risks have been identified at the property that requires remediation. It is recommended that a separate remedial methodology is prepared supported by a site-specific risk assessment
High	Significant potential contaminated land risks have been identified and remediation is required supported by further intrusive ground investigation, risk assessment and remedial design.

1.5.2 Where adverse risks are identified these are discussed within the report.

2.0 SITE SETTING

Table 2.0 Site Description

Item	Description
Site Address	Avon Rd, Littlehampton BN17 6AT
National Grid Reference	TQ 028 021

2.1 Current Site Description

2.1.1 The site comprises of a disused commercial building (an old Waitrose store) and an associated carpark. Avon Road runs in between the disused building and carpark. The topography of the site is generally flat in the west with a dip from the centre of the site to the southwestern corner. Access is directly off Avon Road.

2.1.2 Further information is available within the Enzygo Ltd, Preliminary Risk Assessment, [SHF.1995.004.GE.R.001], dated July 2024.

2.2 Surrounding Area

2.2.1 Land uses surrounding the site are summarised as follows.

Table 2.2.1 Land Use Surrounding the Area

Direction	Land Use
North	Franciscan Way followed by residential and commercial.
East	East St followed by residential and commercial.
West	Anchor Springs followed by residential and commercial.
South	Duke Street followed by residential and commercial.

3.0 SITE INVESTIGATION

3.1 Investigation Rational

3.1.1 British Standards BS10175:2011 and A1:2013 provides guidance on the design of site investigations for potentially contaminated sites. The guidance is provided for a range of sites varying from relatively low risk brown field schemes such as light industrial uses to high-risk sites such as Manufactured Gas Works.

3.1.2 British Standards BS10175:2011 and A1:2013 advocates that the investigation works is undertaken in consecutive stages with an assessment of the data being undertaken at the end of each stage and prior to further works being designed and implemented. These stages are as follows.

- Preliminary investigation (Desk-based) to identify potential risks such as historical land usage and identify potential sources and receptors.
- Main investigation to locate and investigate the areas of potential risk identified from the preliminary investigation. Typically, a sampling density of 20m to 25m is used and there is a recognition that this stage of investigation may be undertaken prior to demolition of the site thereby hampering the extent and location of exploratory holes, and
- The main investigation is then followed, where appropriate, by supplementary investigations to delineate contamination hotspots so that remediation can be designed to address only those areas where a risk is identified.

3.1.3 There is an expectation that the British Standard will apply professional judgement and will understand that the scope of investigation works is to achieve an objective relating to risk and the proposed development, with the development itself potentially providing elements of remediation.

3.2 General

3.2.1 A Ground Investigation [GI] was undertaken by Enzygo between the 24th and 26th June 2024 comprised fifteen [dynamic] windowless sampling boreholes [WS1-WS14 including WS9a] and two trial pits [TP01 – TP02]. WS11 to WS14 refused at depths between 0.40m and 0.60m below existing ground level (begl) due to the presence of densely compacted subbase within the car park. WS2 to WS9a refused between depths of 0.41m begl and 2.06m begl due to the presence of concrete obstruction positioned at the base of a void. This underlying concrete obstruction was too deep to be able to core. WS9a was undertaken as an additional location as WS10 could not be cored, and equipment was damaged during the coring of this location. WS1 was progressed to a depth of 2.80m, and this exploratory borehole refused on a very dense sand [River Terrace Deposits]. TP01 and TP02 both were excavated to a depth of 3.00m begl.

3.2.2 Locations of exploratory holes advanced by Enzygo are presented on the Enzygo 'Exploratory Hole Location Plan' [Drawing No. SHF1995004-ENZ-XX-XX-DR-G-0001], dated August 2024.

3.2.3 It was uncertain what this concrete obstruction is, however, the exploratory hole logs indicate refusal depths and base of the void, generally follow the topography of the surround area. Engineer observations have reported the void as extending continuously laterally and the site to be sloping from west to east. The Three Sixty Group 'Underground Utility Survey (TOPO

Overlay)', DWG No. 4565, dated 28th June 2024 confirm site topography showing a change in elevation of approximately 2.20m.

3.2.4 On review of the Enzygo PRA [SHF.1995.004.GE.R.001], dated July 2024 alongside the findings from the recent Enzygo GI; it would seem unlikely that this concrete obstruction is associated with the historical the residential dwellings or historic bus station [depot] within the southern section of the site, before the site was developed into its current land use. Exploratory Hole locations have been positioned on historical drawings to provide further context. These drawing are available within Appendix 1.

3.2.5 The development occupies an area approx. 5700m^2. The investigation comprised 17no. sampling locations giving a sample density of 25m – 50m in accordance with British Standards BS10175 2011 and A1 2013.

3.2.6 Based on the size of the site this was considered appropriate for the exploratory investigation. The requirement for additional phases of investigation will be considered following an assessment of the findings of this investigation taking account of the proposed development and future conceptual model in accordance with the recommendations given in British Standards BS10175 2011 and A1 2013. This assessment will take account of any design mitigation measures within the proposed development and is discussed in Section 5.

3.3 Site Works

3.3.1 The density of granular soils and shear strength of the cohesive soils was measured using a Standard Penetration Tests (SPT). Results are included on the logs presented in Appendix 2.

3.3.2 Representative soil samples were collected for chemical and geotechnical testing. Soil samples destined for chemical analysis were collected in appropriate containers provided by the analytical laboratory. Samples were stored in cool boxes prior to dispatch to the laboratory for analysis. All samples were collected using appropriate sampling equipment that was cleaned at each sampling location.

3.3.3 Generally, samples were collected from Made Ground, which may contain potential inclusions of contaminating materials and materials displaying evidence of potential contamination.

3.3.4 In the absence of any evidence of contamination, samples were collected near surface as this material is more likely to be contaminated by surface spillages and could potentially be in contact with future residents.

3.4 Laboratory Testing

3.4.1 Samples for geotechnical testing were sent to the laboratories of I2 Analytical, which is UKAS accredited, for the following analysis.

- Particle Size Distribution.
- Atterberg Limits.
- Moisture Content, and
- BRE SD1.

3.4.2 Samples for chemical analysis were sent to I2 Analytical who are UKAS and MCERTS accredited. Samples were tested for the CLEA metal suite, pH, sulphate, cyanide, phenols, speciated Polycyclic Aromatic Hydrocarbons (PAH), organic carbon, speciated Total Petroleum Hydrocarbon (TPH CWG), and asbestos screen.

4.0 GROUND AND GROUNDWATER CONDITIONS

4.1 Summary of Ground and Groundwater Conditions

4.1.1 Ground and groundwater conditions have been assessed with the investigation typically identify the following strata.

Table 4.1.1 Ground and groundwater conditions

Strata	Summary Description	Thickness (m)
Made Ground	Concrete	0.27 to 0.42
	Asphalt	0.10 to 0.30
	Yellowish brown, slightly gravelly, sandy Clay.	0.20 to 0.70
	White sandy, fine to coarse, angular to sub angular, Gravel of concrete and flint.	0.20 to 0.40
River Terrace Deposits	orangish brown slightly silty sandy slightly gravelly Clay.	1.60
	Orange, clayey, silty, fine to medium Sand.	>1.60
	White mottled orangish brown, slightly gravelly, clayey, silty, fine to coarse Sand.	>1.00
Groundwater	Groundwater was not encountered on site in any of the exploratory holes.	N/A

4.1.2 Details of the ground and groundwater conditions as encountered are given on the exploratory hole records included in Appendix 2 and are summarised in the sections below.

4.2 Made Ground

4.2.1 Made Ground was encountered across the site and was proven to maximum depth of 1.40m begl within TP02. Made Ground typically comprised concrete over a yellowish brown, slightly gravelly, sandy Clay, or asphalt over a white sandy fine to coarse angular to sub angular Gravel of concrete and flint. Please note the base of the Made Ground has not been proven within locations WS2 to WS14 (WS9a included). Windowless sampling locations refused within the car park due to the presence of a densely compacted subbase. Windowless sampling locations within the footprint of the existing building refused due to the presence of a concrete obstruction encountered at the base of a void noted between the depths of 0.42m begl to 2.06m begl.

4.3 River Terrace Deposits

4.3.1 River Terrace Deposits were encountered beneath the Made Ground and typically comprised a firm becoming stiff orangish brown slightly silty sandy slightly gravelly Clay, medium dense to very dense orangish brown clayey silty fine to medium Sand or clayey silty slightly gravelly fine to coarse Sand. The River Terrace deposits were proven to a maximum depth of 3.00m begl within TP1 and TP2.

4.3.2 Atterberg and particle size distribution testing has been undertaken which generally confirms material descriptions.

4.4 Visual and Olfactory Evidence of Contamination

4.4.1 No olfactory evidence of contamination was encountered during the site works. There was some minor visual discolouration of the soils within WS1 between the depths of 0.60m to 1.00m begl.

4.5 Groundwater

4.5.1 Groundwater was not encountered within any of the exploratory hole locations during the site works. Groundwater depths from subsequent monitoring are summarised on the table below:

Table 4.5.1 Groundwater monitoring

Exploratory Hole	Depth mbgl)					
	11.07.24	31.7.24	6.8.24	19.8.24	27.8.24	14.9.24
WS1	Dry	Dry	Dry	Dry	Dry	Dry

4.6 Ground Gas

4.6.1 Ground gas monitoring is currently ongoing [one of six] and the interim results are summarised on the table below:

Table 4.6.1 Ground gas monitoring

Exploratory Hole	Atmos. pressure (Mb)	Flow (l/hr)	CH4		CO2		O2
			Concentration (%)	GSV (l/hr)	Concentration (%)	GSV (l/hr)	Concentration (%)
11.07.24							
WS1	1008	0.5	<0.1	<0.0005	0.2	0.001	20.4
31.7.24							
WS1	1013	0.4	<0.1	<0.0004	0.5	0.002	19.9
6.8.24							
WS1	1017	0.4	<0.1	<0.0004	0.5	0.002	19.7
19.8.24							
WS1	1017	0.2	<0.1	<0.0002	0.4	0.0008	20.1
27.8.24							
WS1	998	0.1	<0.1	<0.0001	0.4	0.0008	19.9
14.9.24							
WS1	1001	0.1	<0.1	<0.0001	0.4	0.0008	19.8

5.0 CONTAMINATION ASSESSMENT

5.1 General

5.1.1 A Tier I risk assessment has been undertaken using available and current screening values for human health. The risk assessment is undertaken based on the findings of the preliminary conceptual model presented in the previous PRA [Enzygo PRA, Ref: SHF.1995.004.GE.R.001, dated July 2024]. Based on the contamination testing and Tier I assessment, a revised Conceptual Model has been prepared, which is presented later in this section. Where significant risks are identified remedial measures are recommended.

5.1.2 The contamination assessment has been undertaken using information from the Enzygo GI.

5.2 Human Health

5.2.1 Assessment of the risks to human health has been undertaken by comparing the soil quality data with reference values obtained from the Contaminated Land Exposure Assessment (CLEA), Soil Guideline Values (SGV) and General Acceptance Criteria (GAC) published by LQM and derived in consultation with the Chartered Institute of Environmental Health. The LQM/CIEH S4ULs values are used, and summary tables of the reference values are included in Appendix 5.

5.2.2 Where an exceedance is identified the risk is assessed by considering the sensitivity of the proposed development and the potential pathway. The proposed use of the site is for a new Hotel. As such the GAC values for a commercial end use are considered appropriate.

Table 5.2 Soil quality analysis

Soil Sample Location and Depth	Determinant	Asbestos Containing Material Types Detected (ACM)
WS1 – 0.4m begl	Amosite, Chrysotile, Crocidolite	Loose Fibres & Asbestos Cement
WS13 – 0.3m begl	Chrysotile	loose fibres
TP1 – 0.4m begl	Chrysotile	loose fibres
TP2 – 1.0m begl	Chrysotile	loose fibres

5.2.3 No samples of Made Ground have reported any exceedances of the GAC values when compared to a commercial end. However, four of the samples (WS1, WS13, TP1 and TP2) have tested positive for asbestos likely associated with the historical redevelopment of the site.

5.2.4 When considering the proposed development and the potential foundation solution it may be possible to leave these soils in situ and encapsulate these soils beneath the proposed building and hardstanding, breaking the source pathway receptor link. Regardless, when the proposed layout is finalised a Remediation Method Statement [RMS] should be produced to further details the remedial works.

5.3 Ground Gas

5.3.1 For the assessment of risk from ground gas reference has been made to CIRIA C665 and British Standard BS8485 Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. Where significant potential risk from ground gas is identified from the Initial Conceptual Model and the ground gas monitoring is undertaken and the results of the monitoring are compared against the Gas Screening Values given in CIRIA

Report 665. From this the Characteristic Situation is identified and remedial measures proposed.

5.3.2 When assessing the risk and type of remedial measures appropriate consideration is given to the likely construction of the development, the nature of the gas posing a risk and the nature of the likely source. The use of engineering judgement when determining risk from ground gas is consistent with the recommendations given in CIRIA C665 using a pollutant linkage model.

5.3.3 No significant source of ground gas was identified during the desk study or ground investigation phases.

5.3.4 Gas monitoring was undertaken during return visits which has recorded no significant concentration of Carbon Dioxide or Methane and no flow. Based on the gas monitoring undertake the Gas Screening Value is less than 0.07l/hr and as such falls within Characteristic Situation 1 (CS1).

5.4 Asbestos Management

5.4.1 Asbestos has been detected in soils, as such a precautionary approach should be adopted with respect to the potential for asbestos, given the site's history.

5.4.2 To protect workers, measures should be incorporated into the Contractor's Construction Stage Health and Safety Plan as required under the Construction Design and Management (CDM) Regulations to mitigate risk to construction works. Precautionary measures may include.

- Designing temporary works to minimise disturbance of the backfill material.
- Separating material and disposal of soils containing asbestos.
- Wetting down during excavation.
- Sheeting of stockpiles where (if) asbestos is suspected.
- Testing of soils and off-site disposal of any soils found or suspected of containing asbestos.
- Preventing access to the construction site by members of the public.
- Use of good hygiene measures, including washing down of plant.
- Use of appropriate PPE, including face masks.

5.5 Risk Classification

5.5.1 Enzygo limited has utilised the available information, together with our experience to assess the likely risks to development from land quality issues. Definitions of the risk terms used are provided on the table below.

Table 5.5.1 Risk Classification

Risk	Description
Dismissed	The risk has been dismissed.
Negligible	No contamination risk has been identified which is likely to affect development.
Low	No significant contaminated land risks have been encountered affecting development and a low risk that remediation will be required.
Low-Moderate	There are unlikely to be significant contaminated land issues associated with the site which will adversely affect its re-development. However, minor or localised contamination may be present requiring remediation. Remediation should be possible under a discovery strategy and with a call out service.
Moderate	Some potential contaminated land risks have been encountered or identified which may affect re- development. The risks identified are unlikely to affect the entire site or preclude development. Remediation is considered feasible as part of the development process and no further investigation is considered necessary.
Moderate-High	Some potentially significant contaminated land risks have been identified at the property that requires remediation. It is recommended that a separate remedial methodology is prepared supported by a site-specific risk assessment
High	Significant potential contaminated land risks have been identified and remediation is required supported by further intrusive ground investigation, risk assessment and remedial design.

5.5.2 Where adverse risks from ground instability are identified these are discussed within the report.

5.6 Revised Conceptual Model

5.6.1 A revised Conceptual Model is presented below based on the findings of the ground investigation.

Table 5.6 Revised Conceptual Model

Source contaminants	Location	Exposure Pathway	Potential Receptor	Risk/ Probability of Exposure	Details
Human Health					
Asbestos, metals and hydrocarbons from Made Ground	Unforeseen Contamination	Ingestion dermal and inhalation	Construction Workers Site users	Moderate	Asbestos has been identified within the shallow Made Ground (<`1.5m begl). Standard construction PPE should address risk under CDM 2015 Regulations. Discovery Strategy during construction
Asbestos, metals and hydrocarbons from Made Ground	On-site sources	Ingestion dermal and inhalation	Construction Workers Site users	Moderate	No records of chemical exceedances within the shallow Made Ground. However there has been positive IDs of Asbestos on site within the shallow Made Ground (<1.5m begl). Standard construction PPE will address risk under CDM 2015 Regulations.
Hydrocarbon and metals	Migration from off-site sources	Ingestion dermal and inhalation	Construction Workers Site users	Low	No records of chemical exceedances were encountered within the shallow Made Ground onsite; however, chemical testing was not able to be undertaken site wide.
Ground Gas	Potentially Infilled Ground	Asphyxiant, Toxic & Explosive	Construction Workers Site users	Dismissed	No significant ground gas has been identified.
Radon	Natural Soils	Inhalation	Construction Workers	Dismissed	Radon protective measures are not considered necessary.

Source contaminants	Location	Exposure Pathway	Potential Receptor	Risk/ Probability of Exposure	Details
			Site Users		
Groundwater					
Hydrocarbon and metals	Unforeseen Contamination	Vertical Migration	Groundwater	Low	No records of chemical exceedances within the shallow Made Ground onsite. The superficial deposits comprise River terrace deposits [clay and sand]. The underlying aquifers are Secondary A and Principal.
Surface Water					
Hydrocarbon and metals	Unforeseen Contamination	Horizontal Migration	River Network	Dismissed	No records of chemical exceedances within the shallow Made Ground onsite. There are no water features located within 250m of the site therefore migration [pathway] is very unlikely.
Environmental Receptors					
Onsite contaminants		Ingestion dermal and inhalation	Ecology	Dismissed	No receptor
		Direct	Archaeology	Dismissed	No receptor
		Direct	Geology	Dismissed	No receptor
		Phytotoxic	Woodland	Dismissed	No receptor
		Phytotoxic	Crops	Dismissed	No receptor
		Ingestion dermal and inhalation	Livestock	Dismissed	No receptor
Building Services					
Onsite contaminants		Direct.	Historic Buildings	Dismissed	No receptor
		Direct	Proposed Buildings	Low	No significant source has been identified.
		Permeate into pipework	Water Pipes	Low	To be checked with local water authority.

6.0 REMEDIATION AND VERIFICATION STRATEGY

6.1 General

6.1.1 Four soil samples of Made Ground [WS1, WS13, TP1 & TP2] have returned test results with positive ID's of asbestos, likely associated with the historical redevelopment of the site.

6.1.2 When considering the proposed development and the potential foundation solution it may be possible to leave these soils in situ and encapsulate these soils beneath the proposed building and hardstanding, breaking the source pathway receptor link. Regardless, when the proposed layout is decided a Remediation Method Statement [RMS] should be produced to further detail the remedial works.

6.2 Unforeseen Contamination

6.2.1 Regardless of the investigation works undertaken, there is a residual risk that unforeseen contamination might be encountered on site during the construction works. As such a discovery strategy is proposed.

6.2.2 If unforeseen contamination is encountered during construction works, for example, as suspected localised soils contamination outside the areas investigated, a geo-environmental consultant would be available on a 'call-out' basis to undertake an assessment. If 'unforeseen contamination' is encountered, the remedial strategy would be either to remove or cap the soils, as appropriate, subject to regulatory liaison and approval.

6.3 Waste Classification

6.3.1 Two-part WAC tests were undertaken on three samples in total. All samples were reported as inert.

6.3.2 The Waste Management paper 3 requires the landfill to make an appropriate assessment of the waste classification. As such final assessment will be undertaken by the receiving landfill based on the requirements of their permit.

6.4 Supplementary Investigation

6.4.1 Further GI is recommended to better delineate the extent of Made Ground and potential contaminants present within the area of the disused Waitrose building.

7.0 GEOTECHNICAL ASSESSMENT

7.1 Proposed Development

7.1.1 The proposed development is for a commercial hotel with an associated car park, hard and soft landscaping. A site layout is shown on the Axiom Architects '1st – 4th Floor Plan', [Drawing No. 6122-F2-101 Rev F], dated February 2024, included within Appendix 1.

7.1.2 It is considered that the scheme meets the criteria of Geotechnical Category 1 of Eurocode 7.

7.2 Ground Conditions

7.2.1 Ground conditions comprise variable Made Ground proven to a depth of 1.40m begl in areas, over firm or medium dense to very dense River Terrace Deposits [sand, gravel and clay] proven to a maximum depth 3.0m begl. Please note underlying ground conditions have not been confirmed within the area of the existing disused building onsite due to the presence of a concrete obstruction and void, beneath an initial suspended floor slab.

7.3 Site Preparation

7.3.1 The site should be cleared of any vegetation below areas of proposed development stripped in accordance with Series 200 of the Specification for Highway Works. This should include:

- Any redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill.
- All buried structures and old foundations should be excavated from below the proposed structures with the resulting void backfilled prior to piling works; and
- Clean soils to cover any proposed soft landscape areas.

7.4 Foundations Assessment

7.4.1 A piled solution has been considered most suitable when reviewing all available exploratory hole logs as discussed below.

7.4.2 Made Ground has been proven to a depth of 1.40m begl within the car park, however, depths of Made Ground are unknown beneath the disused 'Waitrose' building [>2.20m].

7.4.3 The River Terrace Deposits have been encountered as variable, either a firm orangish brown Clay or medium dense to very dense Sand or Gravel proven to depths greater than 3m begl. Therefore, these soils would not be considered a suitable founding strata, due to the potential for ground bearing issues and differential settlement.

7.4.4 The Lewes Nodular Chalk Formation was not encountered during the recent Enzygo GI. However, it was recorded within the WDE Consulting GI, encountered between the depths of 1.60m and 3.00m begl within existing car park. The Lewes Nodular Chalk Formation was recorded to be grade Dm or Dc and would be anticipated beneath the existing disused 'Waitrose' building.

7.4.5 Therefore, further investigation is recommended on site in the form of deeper cable percussive boreholes. This will allow for a better understanding of underlying ground conditions which is critical when informing on the sub-structure regime below the site. On completion of the

supplementary GI this reporting should be updated to provide preliminary pile lengths and diameters.

7.5 Materials Re-use

7.5.1 An assessment of the shallow soils suitability for re-use has been undertaken based on the description of the soils and it is considered that River Terrace Deposits may be reusable as general fills.

7.6 Pavement Construction

7.6.1 An assessment of the likely California Bearing Ratio (CBR) has been assessed from the following sources:

- Description of the materials encountered in the exploratory holes; and
- Guidance given in HD25/94 and 73/06.

7.6.2 Based on this it is recommended that an equilibrium CBR of not more than 3% is used, following proof-rolling and with any soft materials removed and replaced with suitable capping. However, the soils are considered to be frost susceptible and an increased construction thickness is likely to be required.

7.7 Buried Concrete

7.7.1 Two soil samples from the River Terrace Deposits have undergone BRE SD1 testing, indicating that soils have soluble sulphate concentrations of less than 0.5 g/l consistent with DS1 Conditions of BRE Special Digest 1 and as such buried concrete may be designed in accordance with ACEC Class AC-1s.

7.8 Excavation

7.8.1 Based on the various site observations it is considered that excavations should be feasible with normal plant, although use of a breaker is likely to be required for excavation of any floor slabs and substructures remaining following demolition works.

7.8.2 Excavations where access is required should be supported in accordance with CIRIA RR97.

7.8.3 Potential issues could arise due to perched groundwaters. It is possible that over pumping of groundwater may occasionally be required.

Appendix 1 - Drawings

KEY:

Trial Pits (TP)

Window Sampler Borehole (WS)

NOTES:

DO NOT SCALE FROM THIS DRAWING

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND DOCUMENTS ASSOCIATED WITH THIS PROJECT.

ALL EXISTING AND PROPOSED DIMENSIONS, LEVELS AND LOCATIONS TO BE CHECKED AND VERIFIED BY THE MAIN CONTRACTOR ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS AND ANY ANOMALIES REPORTED TO THE ENGINEER.

Rev	Date	Description	DRA	CHK	APP
P01	05.08.24	Issued for comment / approval	LB	RF	RF

Project
Waitrose, Littlehampton

Client
Cummings Group Ltd

Drawing Title
Exploratory Hole Location Plan

Scale	Date	Status
1:500 @ A3	05.08.24	Preliminary

DWG No. SHF1995004-ENZ-XX-XX-DR-G-0001 **Revision** P01

Bristol 01454 269 237
Cardiff 02920 023 700
Manchester 0161 413 6444
Cambridge 01799 542 473
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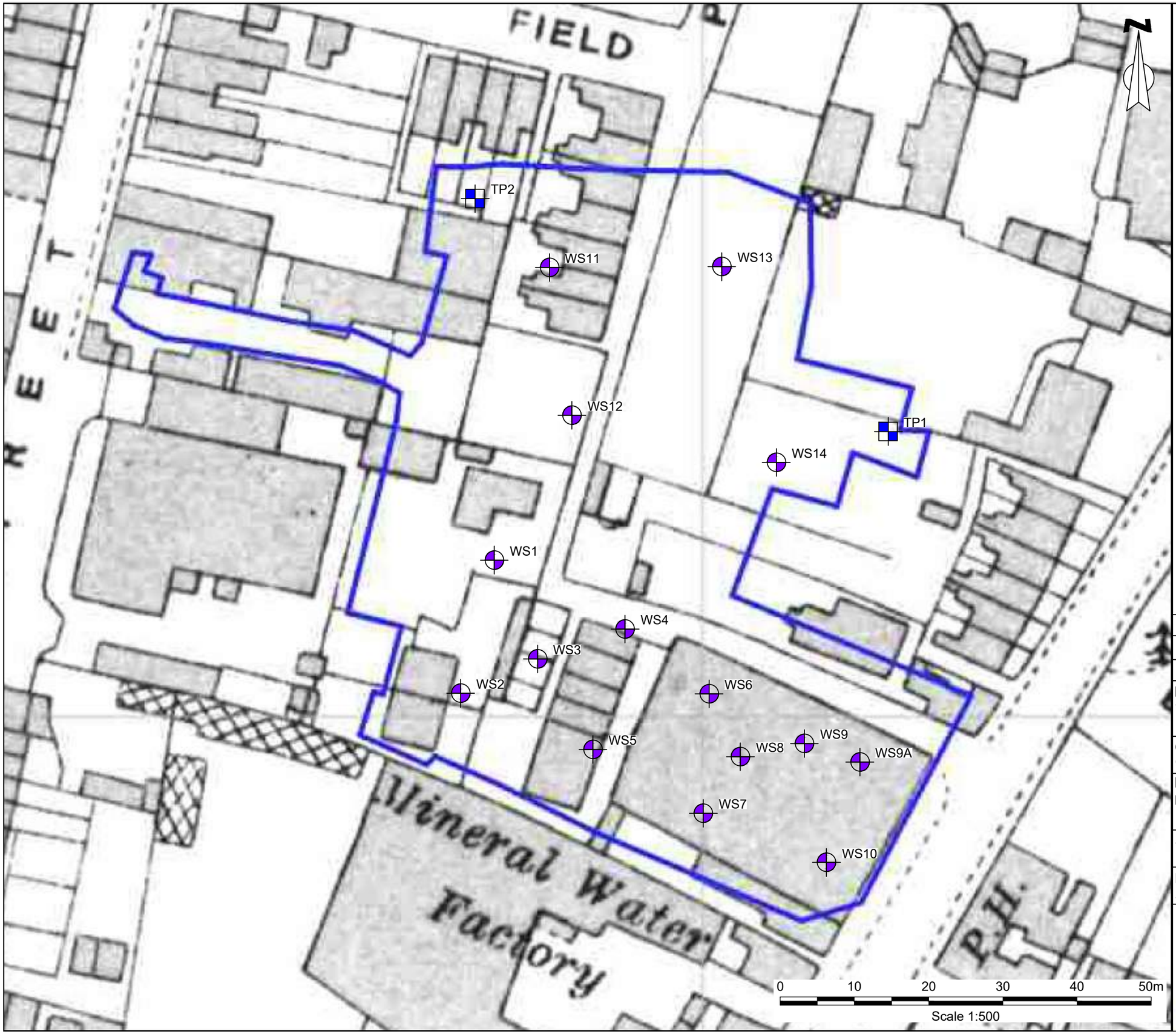


KEY:

- Site Boundary
- Trial Pits (TP)
- Window Sampler Borehole (WS)

NOTES:

DO NOT SCALE FROM THIS DRAWING

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND DOCUMENTS ASSOCIATED WITH THIS PROJECT.

ALL EXISTING AND PROPOSED DIMENSIONS, LEVELS AND LOCATIONS TO BE CHECKED AND VERIFIED BY THE MAIN CONTRACTOR ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS AND ANY ANOMALIES REPORTED TO THE ENGINEER.

Rev	Date	Description	DRA	CHK	APP
P01	05.08.24	Issued for comment / approval	LB	RF	RF

Project
Waitrose, Littlehampton

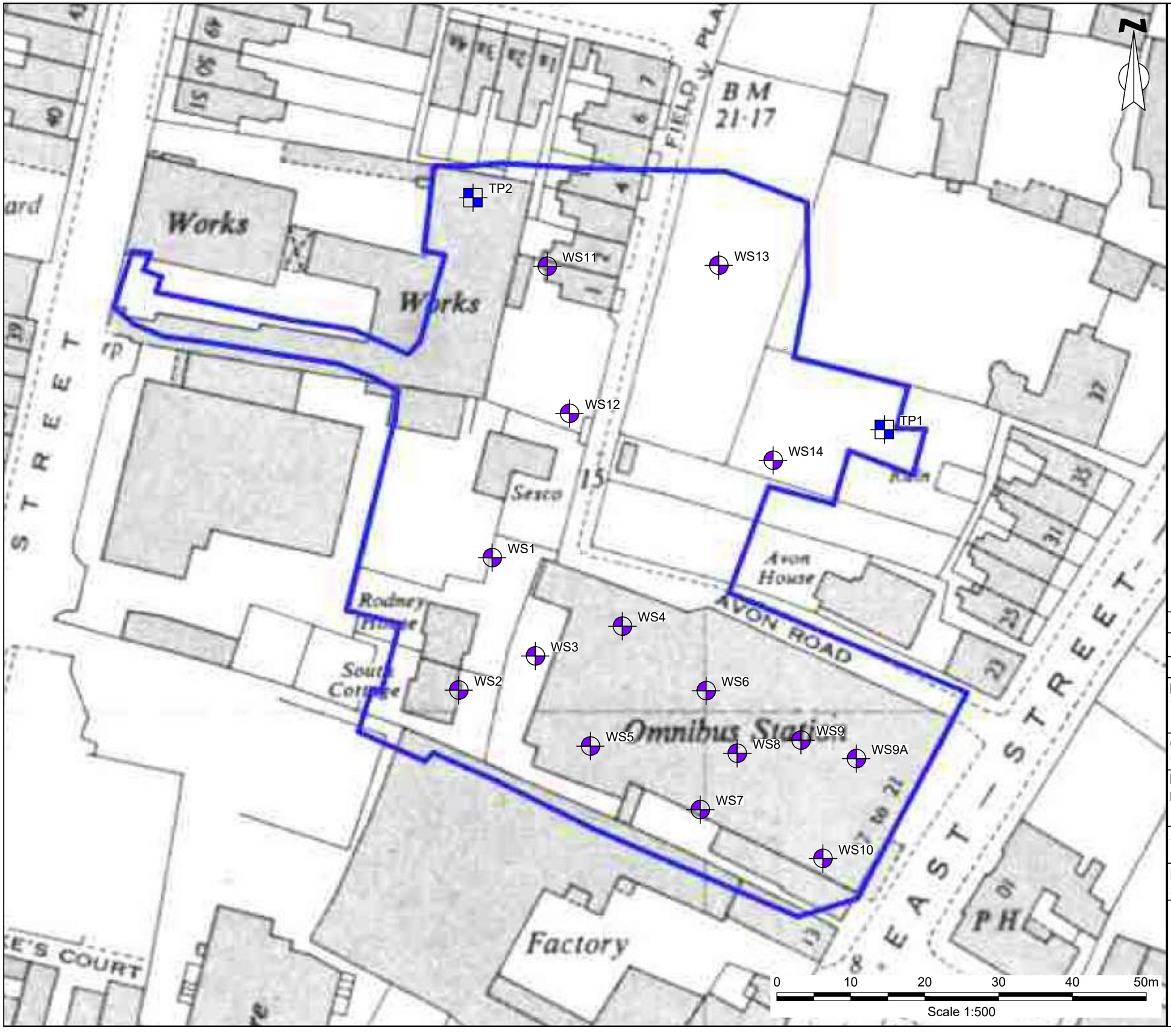
Client
Cummings Group Ltd

Drawing Title
Exploratory Hole Location Plan - 1932

Scale	Date	Status
1:500 @ A3	05.08.24	Preliminary

DWG No. SHF1995004-ENZ-XX-XX-DR-G-0003 **Revision** P01

Bristol 01454 269 237
Cardiff 02920 023 700
Manchester 0161 413 6444
Cambridge 01799 542 473
Sheffield 0114 321 5151
Belfast 07377673948
@enzygo
enzygo.com
hello@enzygo.com



KEY:

- Site Boundary
- Trial Pits (TP)
- Window Sampler Borehole (WS)

NOTES:

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Rev	Date	Description	DRA	CHK	APP
P01	05.08.24	Issued for comment / approval	LB	RF	RF

Project
Waitrose, Littlehampton

Client
Cummings Group Ltd

Drawing Title
Exploratory Hole Location Plan - 1958

Scale	Date	Status
1:500 @ A3	05.08.24	Preliminary

DWG No. SHF1995004-ENZ-XX-XX-DR-G-0004 **Revision** P01

Bristol 01454 269 237
Cardiff 02920 023 700
Manchester 0161 413 6444
Cambridge 01799 542 473
Sheffield 0114 321 5151
Belfast 07377673948
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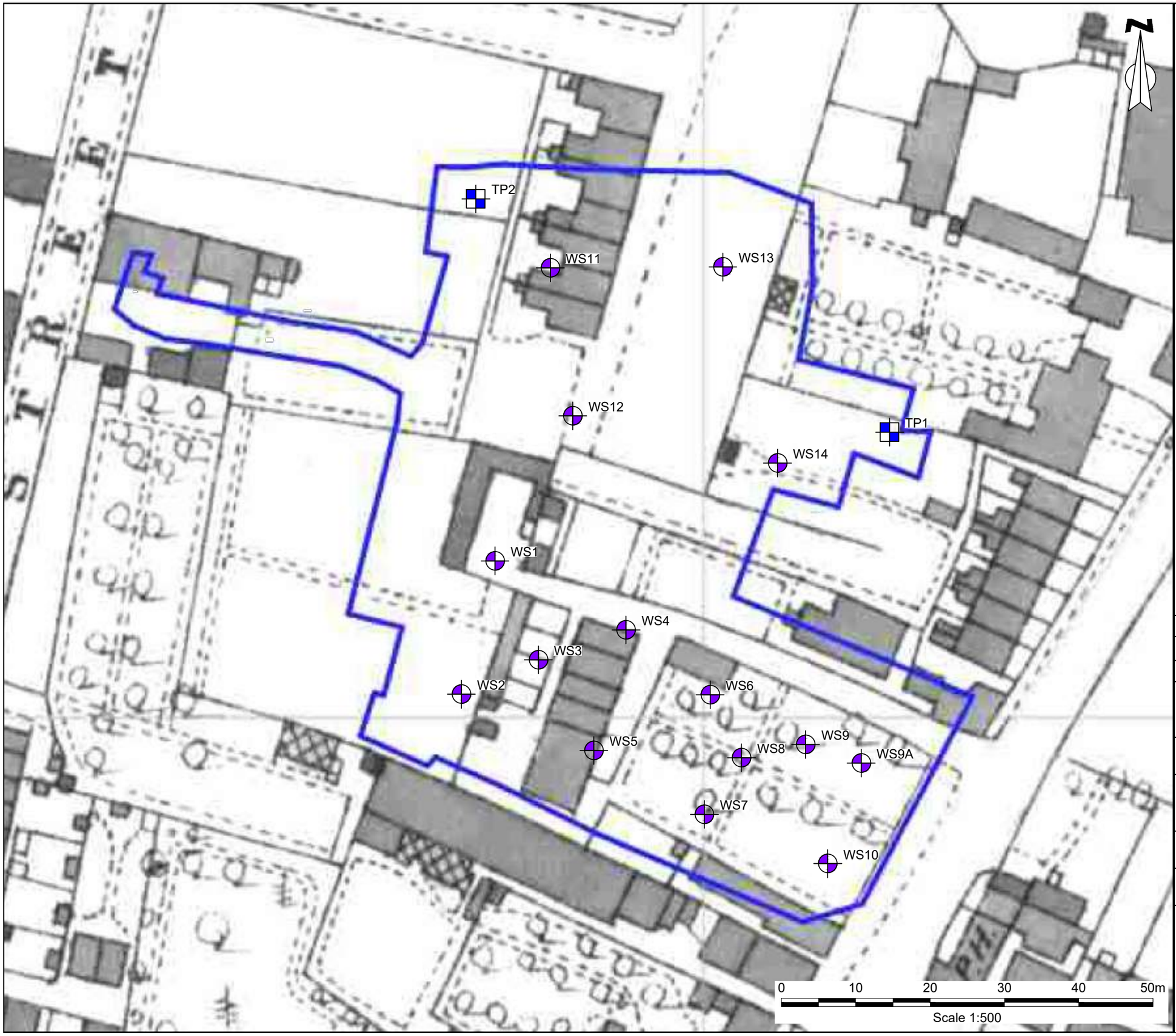

KEY:

- Site Boundary
- Trial Pits (TP)
- Window Sampler Borehole (WS)

NOTES:

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ALL EXISTING AND PROPOSED DIMENSIONS, LEVELS AND LOCATIONS TO BE CHECKED AND VERIFIED BY THE MAIN CONTRACTOR ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS AND ANY ANOMALIES REPORTED TO THE ENGINEER.

Rev	Date	Description	DRA	CHK	APP
P01	05.08.24	Issued for comment / approval	LB	RF	RF

Project
Waitrose, Littlehampton

Client
Cummings Group Ltd

Drawing Title
Exploratory Hole Location Plan - 1879

Scale	Date	Status
1:500 @ A3	05.08.24	Preliminary

DWG No. SHF1995004-ENZ-XX-XX-DR-G-0002 **Revision** P01

Bristol 01454 269 237
Cardiff 02920 023 700
Manchester 0161 413 6444
Cambridge 01799 542 473
Sheffield 0114 321 5151
Belfast 07377673948

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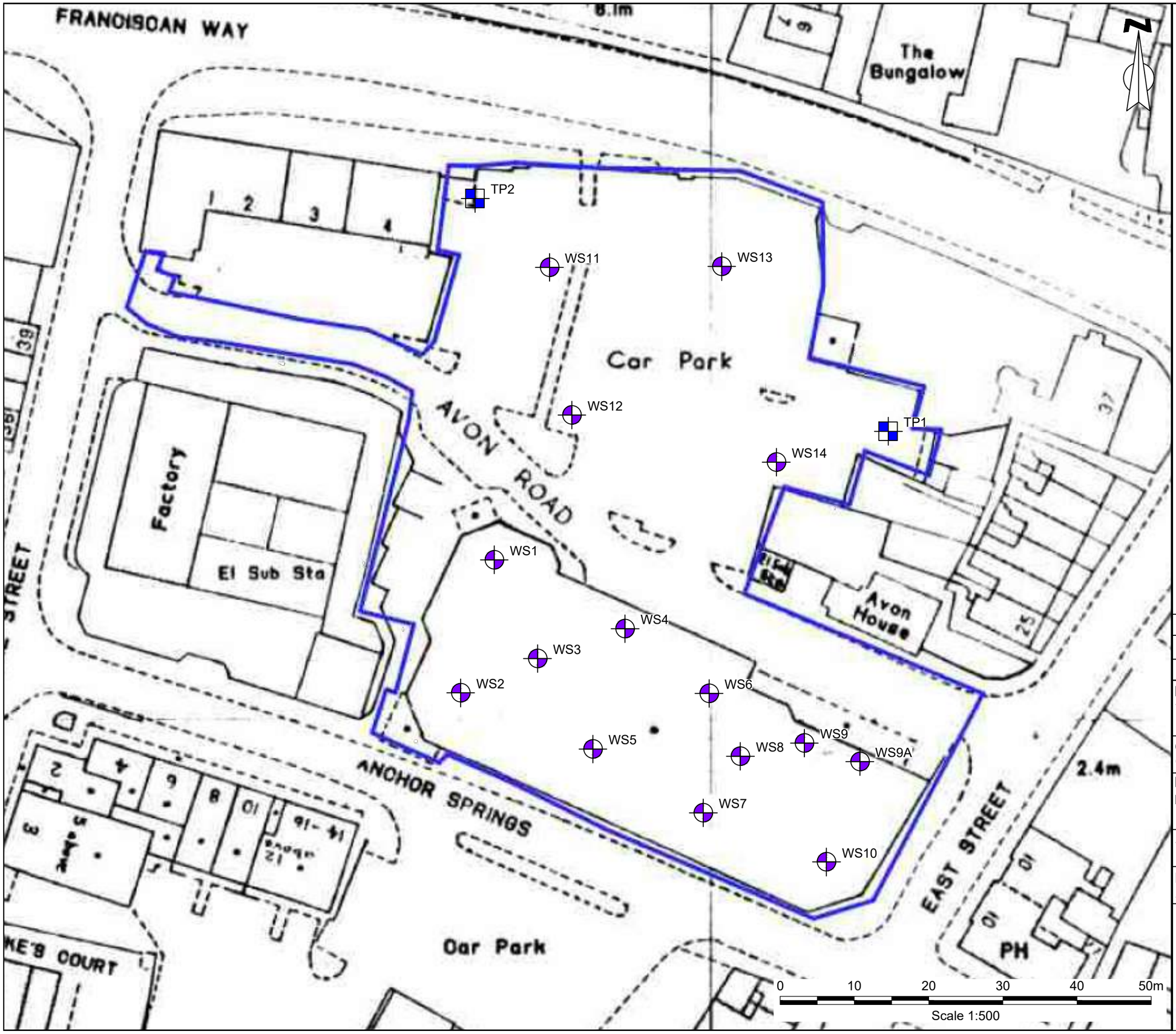
hello@enzygo.com



KEY:

- Site Boundary
- Trial Pits (TP)
- Window Sampler Borehole (WS)

NOTES:

DO NOT SCALE FROM THIS DRAWING

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND DOCUMENTS ASSOCIATED WITH THIS PROJECT.

ALL EXISTING AND PROPOSED DIMENSIONS, LEVELS AND LOCATIONS TO BE CHECKED AND VERIFIED BY THE MAIN CONTRACTOR ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS AND ANY ANOMALIES REPORTED TO THE ENGINEER.

Rev	Date	Description	DRA	CHK	APP
P01	05.08.24	Issued for comment / approval	LB	RF	RF

Project
Waitrose, Littlehampton

Client
Cummings Group Ltd

Drawing Title
Exploratory Hole Location Plan - 1987

Scale	Date	Status
1:500 @ A3	05.08.24	Preliminary

DWG No. SHF1995004-ENZ-XX-XX-DR-G-0005 **Revision** P01

Bristol 01454 269 237
Cardiff 02920 023 700
Manchester 0161 413 6444
Cambridge 01799 542 473
Sheffield 0114 321 5151
Belfast 07377673948
@enzygo
enzygo.com
hello@enzygo.com

Site boundary

105 Total Parking spaces

Floor	Double - 1.1	Double - 1.2	Quad	UA	Floor Total	Floor GIA
G	6		2	1	9	897
1	8		20	2	30	897
2	8		21	1	30	897
3	8		21	1	30	897
4	8		21	1	30	897
Total	**38**	**0**	**85**	**6**	**129**	**4485**
%	**29%**	**0%**	**66%**	**5%**	GIA/Room	**34.77**
		38	**85**	**6**		
		29%	**66%**	**5%**		

95 Existing car parking spaces
(incl. 7 UA spaces)

Existing layby and crossing

Stair

Avon Road

4x New UA
parking spaces.

Hotel Entry

Delivery Bay

Lift Overrun

Green Roof, PV & AC condensers
(To be coordinated)

Linen
Deliveries

Refuse

Cellar
Deliveries

Deliveries

Stair

Anchor Springs

East Street

Rev	Date	Description	By	Chk
F	06/02/24	Updating floorplans to test efficiency	JG	
E	06/02/24	Adding new 4th floor	JG	
D	04/01/224	Updated Schedules	JG	

AXIOM ARCHITECTS
Morelands 5-27 Old Street London EC1V 9HL
Tel. 0207 421 8866 www.axiomarchitects.co.uk

Client
Whitbread Group PLC

Project
Anchor Springs
Littlehampton

Drawing
Site Plan

Scale	Date	Drawn	Checked
1:200 @ A1	04/01/24	DRA	JM

Drawing No. **Revision**

6122-F2-001 F

Status
FEASIBILITY

Floor	Double - 1.1	Double - 1.2	Quad	UA	Floor Total	Floor GIA
G	6		2	1	9	897
1	8		20	2	30	897
2	8		21	1	30	897
3	8		21	1	30	897
4	8		21	1	30	897
Total	**38**	**0**	**85**	**6**	**129**	**4485**
%	**29%**	**0%**	**66%**	**5%**	GIA/Room	**34.77**
		38	**85**	**6**		
		29%	**66%**	**5%**		

Rev	Date	Description	By	Chk
F	06/02/24	Updating floorplans to test efficiency	JG	
E	06/02/24	Adding new 4th floor	JG	
D	04/01/224	Updated Schedules	JG	

AXIOM ARCHITECTS
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Tel. 0207 421 8866 www.axiomarchitects.co.uk

Client
Whitbread Group PLC

Project
Anchor Springs
Littlehampton

Drawing
Site Plan - Flood Risk

Scale	Date	Drawn	Checked
1:200 @ A1	04/01/24	DRA	JM

Drawing No. **Revision**
6122-F2-002 **F**

Status
FEASIBILITY

Floor	Double - 1.1	Double - 1.2	Quad	UA	Floor Total	Floor GIA
G	6		2	1	9	897
1	8		20	2	30	897
2	8		21	1	30	897
3	8		21	1	30	897
4	8		21	1	30	897
Total	**38**	**0**	**85**	**6**	**129**	**4485**
%	**29%**	**0%**	**66%**	**5%**	GIA/Room	**34.77**
		38	**85**	**6**		
		29%	**66%**	**5%**		

Rev	Date	Description	By	Chk
F	06/02/24	Updating floorplans to test efficiency	JG	
E	06/02/24	Adding new 4th floor	JG	
D	04/01/224	Updated Schedules	JG	

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Morelands 5-27 Old Street London EC1V 9HL
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Client
Whitbread Group PLC

Project
Anchor Springs
Littlehampton

Drawing
Site Plan - Existing Waitrose Overlay

Scale	Date	Drawn	Checked
1:200 @ A1	04/01/24	DRA	JM

Drawing No. **Revision**
6122-F2-003 **F**

Status
SKETCH

Floor	Double - 1.1	Double - 1.2	Quad	UA	Floor Total	Floor GIA
G	6		2	1	9	897
1	8		20	2	30	897
2	8		21	1	30	897
3	8		21	1	30	897
4	8		21	1	30	897
Total	**38**	**0**	**85**	**6**	**129**	**4485**
%	**29%**	**0%**	**66%**	**5%**	GIA/Room	**34.77**
		38	**85**	**6**		
		29%	**66%**	**5%**		

Rev	Date	Description	By	Chk
F	06/02/24	Updating floorplans to test efficiency	JG	
E	06/02/24	Adding new 4th floor	JG	
D	04/01/224	Updated Schedules	JG	

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Morelands 5-27 Old Street London EC1V 9HL
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Client
Whitbread Group PLC

Project
Anchor Springs
Littlehampton

Drawing
Ground Floor

Scale	Date	Drawn	Checked
1:150 @ A1	06/02/24	DRA	JM

Drawing No. **Revision**
6122-F2-100 F

Status
FEASIBILITY

Floor	Double - 1.1	Double - 1.2	Quad	UA	Floor Total	Floor GIA
G	6		2	1	9	897
1	8		20	2	30	897
2	8		21	1	30	897
3	8		21	1	30	897
4	8		21	1	30	897
Total	**38**	**0**	**85**	**6**	**129**	**4485**
%	**29%**	**0%**	**66%**	**5%**	GIA/Room	**34.77**
		38	**85**	**6**		
		29%	**66%**	**5%**		

Rev	Date	Description	By	Chk
F	06/02/24	Updating floorplans to test efficiency	JG	
E	06/02/24	Adding new 4th floor	JG	
D	04/01/224	Updated Schedules	JG	

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Morelands 5-27 Old Street London EC1V 9HL
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Client
Whitbread Group PLC

Project
Anchor Springs
Littlehampton

Drawing
1st - 4th Floor Plan

Scale	Date	Drawn	Checked
1:150 @ A1	06/02/24	JG	JM

Drawing No. **Revision**
6122-F2-101 F

Status
FEASIBILITY

Appendix 2 - Exploratory Hole Logs

Trial Pit Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 25/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name:	Equipment: Excavator

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP01	TP		DJ	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.20			MADE GROUND: Asphalt
	0.30	D					MADE GROUND: White sandy, fine to coarse, angular to sub angular, concrete and flint GRAVEL with rare brick. Sand is fine to coarse.
	0.30	ES		0.40			
	0.50	B					Firm, orangish brown, very sandy CLAY, locally tending to very silty, clayey sand. Sand is fine to medium. (River Terrace Deposits)
	1.00	B					
	1.00	D					
	2.00	B		2.00			White mottled orangish brown, slightly gravelly, silty, fine to coarse SAND, locally tending to slightly gravelly, very sandy clay. Gravel is fine to medium, angular to sub angular chalk and flint. (River Terrace Deposits)
	2.00	D					
	3.00	B		3.00			End of Borehole at 3.00m
	3.00	D					

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	Sides remained stable.	N/A	No services encountered. Groundwater not encountered.			

Remarks

Machine excavated to 3.0m. No services encountered. Backfilled with arisings on completion.

Trial Pit Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 25/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name:	Equipment: Excavator

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP02	TP		DJ	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	D		0.30			MADE GROUND: Asphalt
	0.30	ES					
	0.50	B					MADE GROUND, Subbase: White sandy, fine to coarse, angular to sub angular, concrete and flint GRAVEL with rare brick. Sand is fine to coarse.
				0.70			MADE GROUND: Stiff, dark brown, very sandy CLAY, locally tending to clayey sand with rare brick and flint gravel.
	1.00	B					
	1.00	D					
				1.40			Orange, silty, fine to medium SAND. (River Terrace Deposits)
	2.00	B					
	2.00	D					
				2.50			Reddish orange clayey gravelly fine to medium SAND. Gravel is angular to sub angular, fine to coarse flint and chalk. (River Terrace Deposits)
	3.00	B		3.00			End of Borehole at 3.00m
	3.00	D					

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
3.00	0.60	Sides remained stable.	N/A	No services encountered. Groundwater not encountered.			

Remarks

Machine excavated to 3.0m. No services encountered. Backfilled with arisings on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 25/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS01	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	D		0.40			MADE GROUND: Concrete.
	0.30	ES		0.60			MADE GROUND: Soft, Yellowish brown, slightly gravelly, sandy CLAY. Sand is fine to coarse. Gravel is fine, sub rounded to angular chalk and flint.
	1.00	D		1.00			MADE GROUND: Firm, yellowish brown with black and red stains stains, slightly gravelly, slightly sandy CLAY. Sand is fine to medium. Gravel is fine to medium, angular brick with rare sub rounded chalk.
	1.00	SPT	N=12 (3,2/2,3,3,4)				Firm, orange, sandy CLAY. Sand is fine to medium. (River Terrace Deposits)
	2.00	D					
	2.00	SPT	N=20 (4,5/5,5,5,5)	2.20			Medium-dense becoming very dense, orange, slightly gravelly, fine to medium SAND. Gravel is fine to coarse, angular flint. (River Terrace Deposits)
	2.55	SPT	N=50 (7,10/50 for 255mm)				
	2.80	D		2.80			End of Borehole at 2.80m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Waterflush rotary cored 0.00 to 0.40m. Dynamic sampled 0.40m to 2.55m. No groundwater encountered. Services not encountered. Borehole terminated following SPT refusal at 2.80m. On completion a slotted standpipe (50mm) was installed to 2.55m, granular response zone to 2.80-1.00m, bentonite seal 1.00-0.20m. Concrete lockable stopcock cover 0.20-0.00m bgl.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 25/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS02	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.32			MADE GROUND: Concrete.
				0.41			VOID
				0.42			MADE GROUND: Concrete obstruction.
							End of Borehole at 0.42m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Waterflush rotary cored 0.00 to 0.32m. Void encountered 0.32m to 0.42. No services encountered. No groundwater encountered. Borehole terminated at 0.42 due to Concrete obstruction. Covered with wooden slab on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 25/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS03	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.30			MADE GROUND: Concrete.
							Void
				1.11			MADE GROUND: Concrete obstruction.
				1.12			End of Borehole at 1.12m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Waterflush rotary cored 0.00 to 0.30m. No services encountered. No groundwater encountered. Void encountered 0.30m to 1.12. Refusal at 1.12 due to concrete obstruction. Covered with wooden slab on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 25/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS04	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.27			MADE GROUND: Concrete.
							Void.
				1.16			
				1.17			MADE GROUND: Concrete obstruction.
							End of Borehole at 1.17m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Waterflush rotary cored 0.00 to 0.27m. No services encountered. No groundwater encountered. Void encountered 0.27m to 1.17. Borehole terminated at 1.17 due to concrete obstruction. Covered with wooden slab on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 25/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS05	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.30			MADE GROUND: Concrete.
							Void.
				1.36			MADE GROUND: Concrete obstruction.
				1.37			End of Borehole at 1.37m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Waterflush rotary cored 0.00 to 0.30m. Void encountered 0.30m to 1.37. No services encountered. No groundwater encountered. Borehole terminated at 1.37 due to concrete obstruction. Covered with wooden slab on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 25/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS06	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.30			MADE GROUND: Concrete.
							Void.
				1.69			MADE GROUND: Concrete obstruction.
				1.70			End of Borehole at 1.70m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Waterflush rotary cored 0.00 to 0.30m. Void encountered 0.30m to 1.70. No services encountered. No groundwater encountered. Borehole terminated at 1.70 due to concrete obstruction. Covered with wooden slab on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 25/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS07	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.30			MADE GROUND: Concrete.
							Void.
				1.66			MADE GROUND: Concrete obstruction.
				1.67			End of Borehole at 1.67m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Waterflush rotary cored 0.00 to 0.30m. Void encountered 0.30m to 1.67. No services encountered. No groundwater encountered. Borehole terminated at 1.67 due to concrete obstruction. Covered with wooden slab on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 26/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS08	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.30			MADE GROUND: Concrete.
							Void.
				1.74			MADE GROUND: Concrete obstruction.
				1.75			End of Borehole at 1.75m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Waterflush rotary cored 0.00 to 0.30m. Void encountered 0.30m to 1.75. No services encountered. No groundwater encountered. Refusal at 1.75 due to concrete obstruction. Covered with wooden slab on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 26/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS09	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.30			MADE GROUND: Concrete.
							Void.
				2.05			MADE GROUND: Concrete obstruction.
				2.06			End of Borehole at 2.06m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Waterflush rotary cored 0.00 to 0.30m. Void encountered 0.30m to 2.06m. No services encountered. No groundwater encountered. Borehole terminated at 2.06m due to concrete obstruction. Covered with wooden slab on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 25/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS09a	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.30			MADE GROUND: Concrete.
							Void.
				1.45			MADE GROUND: Concrete obstruction.
				1.46			End of Borehole at 1.46m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Waterflush rotary cored 0.00 to 0.30m. Void encountered 0.30m to 1.46m. No services encountered. No groundwater encountered. Borehole terminated at 1.46m due to concrete obstruction. Covered with wooden slab on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 26/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS10	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.10			MADE GROUND: Concrete.
				0.30			MADE GROUND: Poorly cemented concrete.
				0.40			MADE GROUND: Concrete.
							End of Borehole at 0.40m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Waterflush rotary cored 0.00m to 0.40m. No services encountered. No groundwater encountered. Borehole terminated at 0.4m bgl.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 24/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS11	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30 0.30 0.36	D ES SPT	N=0 (75 for 40mm/0 for 0mm)	0.10 0.40			MADE GROUND: Asphalt. White sandy, fine to coarse, angular to sub angular, concrete and flint GRAVEL. Sand is fine to coarse. End of Borehole at 0.40m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Hand dug inspection pit to 0.10m. Dynamic sample barrel 0.10m to 0.36m. Groundwater not encountered. Services not encountered. Borehole terminated following SPT refusal at 0.40m. Backfilled with arisings on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 24/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS12	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30 0.30 0.34	D ES SPT	N=50 (25 for 40mm/50 for 20mm)	0.10 0.40			MADE GROUND: Asphalt. White sandy, fine to coarse, angular to sub angular, concrete and flint GRAVEL. Sand is fine to coarse. End of Borehole at 0.40m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Hand dug inspection pit to 0.10m. Dynamic sample barrel 0.10m to 0.34m. Groundwater not encountered. Services not encountered. Borehole terminated following SPT refusal at 0.40m. Backfilled with arisings on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 24/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS13	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30 0.30 0.40	D ES SPT	N=50 (25 for 40mm/50 for 20mm)	0.10 0.46			MADE GROUND: Asphalt. MADE GROUND: White sandy, fine to coarse, angular to sub angular, concrete and flint GRAVEL. Sand is fine to coarse. End of Borehole at 0.46m

1 2 3 4 5 6 7 8 9 10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Hand dug inspection pit to 0.10m. Dynamic sampled 0.10m to 0.40m. Groundwater not encountered. Services not encountered. Borehole terminated following SPT refusal at 0.46m. Backfilled with arisings on completion.

Window Sample Log

Project Name: Waitrose, Littehampton	Client: Cummings Group Ltd	Date: 24/06/2024
Location: Waitrose, Littlehampton	Contractor: PM Sampling	
Project No. : SHF.1995.004	Crew Name: PM	Drilling Equipment: Archway lightweight Dart

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS14	WS		DJ	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.10			MADE GROUND: Asphalt
	0.30	D					White sandy, fine to coarse, angular to sub angular, concrete and flint GRAVEL. Sand is fine to coarse.
	0.30	ES					
	0.56	SPT	N=50 (25 for 30mm/50 for 10mm)	0.60			End of Borehole at 0.60m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Lightweight archway dart rig. Hand dug inspection pit to 0.10m. Dynamic sample barrel 0.10m to 0.56m. Groundwater not encountered. Services not encountered. Borehole terminated following SPT refusal at 0.60m, Backfilled with arisings on completion.

Appendix 3 - Chemical Testing Results

Enzygo Geoenvironmental Ltd
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e: Reuben.Fisher@enzygo.com

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

Analytical Report Number : 24-028548

Project / Site name:	Anchor Springs	**Samples received on:**	02.07.2024
Your job number:	SHF 1995 004	**Samples instructed on/ Analysis started on:**	02.07.2024
Your order number:	SHF 1995 004	**Analysis completed by:**	10.07.2024
Report Issue Number:	1	**Report issued on:**	10.07.2024
Samples Analysed:	7 soil samples		

Signed: [redacted]

Rafał Szczepańczyk
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
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.

Analytical Report Number: 24-028548
Project / Site name: Anchor Springs
Your Order No: SHF 1995 004

Lab Sample Number				245546	245547	245548	245549	245550
Sample Reference				WS1	WS11	WS13	TP1	TP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.30	0.30	0.40	0.40
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	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	18.7	32.6	9.1
Moisture Content	%	0.01	NONE	13	4.8	6.9	7.2	9
Total mass of sample received	kg	0.1	NONE	0.4	0.4	0.4	0.9	0.9
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Detected	Not-detected	Detected	Detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MBI	MBI	MBI	MBI	MBI
Actinolite detected	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	-
Amosite detected	Type	N/A	ISO 17025	Detected	-	Not-detected	Not-detected	-
Anthophyllite detected	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	-
Chrysotile detected	Type	N/A	ISO 17025	Detected	-	Detected	Detected	-
Crocidolite detected	Type	N/A	ISO 17025	Detected	-	Not-detected	Not-detected	-
Tremolite detected	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	-
Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	Loose Fibres, Asbestos Cement	-	Loose Fibres	Loose Fibres	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.08	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	0.21	0.31	0.1	< 0.05	0.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.09	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.51	0.8	0.25	0.4	0.28
Pyrene	mg/kg	0.05	MCERTS	0.49	0.67	0.24	0.52	0.24
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.24	0.31	0.12	0.31	0.11
Chrysene	mg/kg	0.05	MCERTS	0.24	0.31	0.12	0.33	0.12
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.37	0.34	0.21	0.4	0.18
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.13	0.19	0.08	0.21	0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.3	0.31	0.16	0.33	0.13
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.19	0.17	0.1	0.21	0.08
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	0.22	0.19	0.12	0.23	0.1
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	2.98	3.73	1.51	2.94	1.38
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.5	8.5	9.7	8.3	9.4
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	2.2	0.5	1	1.2
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	11	16	17	14	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	11	12	9.5	9.8	10
Lead (aqua regia extractable)	mg/kg	1	MCERTS	34	29	22	17	26
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	12	9.1	10	9.4	9.7
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	49	77	46	38	43

Analytical Report Number: 24-028548
Project / Site name: Anchor Springs
Your Order No: SHF 1995 004

Lab Sample Number				245546	245547	245548	245549	245550
Sample Reference				WS1	WS11	WS13	TP1	TP2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.30	0.30	0.40	0.40
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPHCWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
TPHCWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	3.7	< 2.0	< 2.0	< 2.0
TPHCWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPHCWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	19	31	15	61	26
TPHCWG - Aliphatic >EC5 - EC35 EH_CU+HS_1D_AL	mg/kg	10	NONE	19	34	15	61	26
TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	12	< 10	< 10	65	< 10
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR	mg/kg	10	NONE	12	< 10	< 10	65	< 10
VOCs								
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-028548
Project / Site name: Anchor Springs
Your Order No: SHF 1995 004

Lab Sample Number				245551	245552
Sample Reference				TP1	TP2
Sample Number				None Supplied	None Supplied
Depth (m)				1.00	1.00
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	39.8
Moisture Content	%	0.01	NONE	5.7	7.1
Total mass of sample received	kg	0.1	NONE	0.4	0.4

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Detected
Asbestos Analyst ID	N/A	N/A	N/A	MMI	MMI
Actinolite detected	Type	N/A	ISO 17025	-	Not-detected
Amosite detected	Type	N/A	ISO 17025	-	Not-detected
Anthophyllite detected	Type	N/A	ISO 17025	-	Not-detected
Chrysotile detected	Type	N/A	ISO 17025	-	Detected
Crocidolite detected	Type	N/A	ISO 17025	-	Not-detected
Tremolite detected	Type	N/A	ISO 17025	-	Not-detected
Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	-	Loose Fibres

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	9.2
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	26	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	8.6
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	50	40

Analytical Report Number: 24-028548
Project / Site name: Anchor Springs
Your Order No: SHF 1995 004

Lab Sample Number				245551	245552
Sample Reference				TP1	TP2
Sample Number				None Supplied	None Supplied
Depth (m)				1.00	1.00
Date Sampled				Deviating	Deviating
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Petroleum Hydrocarbons					
TPHCWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020
TPHCWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.02	NONE	< 0.020	< 0.020
TPHCWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.05	NONE	< 0.050	< 0.050
TPHCWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	< 1.0	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	< 2.0	< 2.0
TPHCWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0
TPHCWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	< 8.0	< 8.0
TPHCWG - Aliphatic >EC5 - EC35 EH_CU+HS_1D_AL	mg/kg	10	NONE	< 10	< 10
TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	NONE	< 0.010	< 0.010
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.05	NONE	< 0.050	< 0.050
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	< 1.0	< 1.0
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	< 2.0	< 2.0
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	< 10
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	< 10	< 10
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR	mg/kg	10	NONE	< 10	< 10
VOCs					
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-028548
Project / Site name: Anchor Springs

* 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 *
245546	WS1	None Supplied	0.4	Brown clay and sand with gravel
245547	WS11	None Supplied	0.3	Brown clay and sand with gravel
245548	WS13	None Supplied	0.3	Brown sand with gravel and stones
245549	TP1	None Supplied	0.4	Brown sand with gravel and stones
245550	TP2	None Supplied	0.4	Brown sand with gravel and stones
245551	TP1	None Supplied	1	Brown clay and sand with gravel
245552	TP2	None Supplied	1	Brown sand with gravel and stones

Analytical Report Number : 24-028548
Project / Site name: Anchor Springs

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
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, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
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	L038B	D	MCERTS
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	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088	D/W	MCERTS

Analytical Report Number : 24-028548
Project / Site name: Anchor Springs

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
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	W	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' 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 - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

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[redacted]

Analytical Report Number : 24-028549

Project / Site name:	Anchor Springs	**Samples received on:**	02/07/2024
Your job number:	SHF 1995 004	**Samples instructed on/ Analysis started on:**	02/07/2024
Your order number:	SHF 1995 004	**Analysis completed by:**	10/07/2024
Report Issue Number:	1	**Report issued on:**	10/07/2024
Samples Analysed:	3 soil samples - 3 2stage samples		

Signed: [redacted]

Izabela Wójcik
Senior 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.

Analytical Report Number: 24-028549
Project / Site name: Anchor Springs
Your Order No: SHF 1995 004

Lab Sample Number				245553	245554	245555
Sample Reference				TP1	TP2	WS1
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	2.00	1.00
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	9.9	12	9.7
Total mass of sample received	kg	0.1	NONE	0.5	0.5	0.5
General Inorganics						
pH (L005B)	pH Units	N/A	MCERTS	7.6	7.4	7.6
Total Organic Carbon (TOC) – Manual	%	0.1	MCERTS	< 0.1	< 0.1	0.3
Loss on Ignition @ 450°C	%	0.2	MCERTS	1.5	1.6	1.8
Acid Neutralisation Capacity	+/- mmol/kg	-9999	NONE	1.3	0.49	0.73
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	< 0.80
Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.85	< 0.85	< 0.85
Petroleum Hydrocarbons						
Mineral Oil (EC10 - EC40) EH_CU_1D_AL	mg/kg	10	NONE	< 10	< 10	< 10
VOCs						
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0
Total BTEX	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0

Analytical Report Number: 24-028549
Project / Site name: Anchor Springs
Your Order No: SHF 1995 004

Lab Sample Number				245553	245554	245555
Sample Reference				TP1	TP2	WS1
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.50	2.00	1.00
Date Sampled				Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
PCBs by GC-MS						
PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
Total PCBs	mg/kg	0.007	MCERTS	< 0.007	< 0.007	< 0.007

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Waste Acceptance Criteria Analytical Results

Report No:	**24-028549**						
					Client:	**ENZYGOGEO**	
Location	**Anchor Springs**						
Lab Reference (Sample Number)	245553				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	/ /				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TP1						
Depth (m)	0.50						
Solid Waste Analysis							
TOC (%)**	< 0.1				3%	5%	6%
Loss on Ignition (%) **	1.5				--	--	10%
BTEX (µg/kg)**	< 5.0				6000	--	--
Sum of PCBs (mg/kg)**	< 0.007				1	--	--
Mineral Oil (mg/kg) EH_1D_CU_AL	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.85				100	--	--
pH (units)**	7.6				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	1.3				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 3 preparation utilising end over end leaching procedure)	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
	mg/l	mg/l		mg/kg			
Arsenic *	0.0077	0.0068		0.069	0.5	2	25
Barium *	0.0067	0.0081		0.080	20	100	300
Cadmium *	< 0.00010	< 0.00010		< 0.0010	0.04	1	5
Chromium *	< 0.00060	0.0037		0.034	0.5	10	70
Copper *	0.015	0.0037		0.046	2	50	100
Mercury *	< 0.00070	< 0.0007		< 0.0070	0.01	0.2	2
Molybdenum *	0.017	0.0067		0.076	0.5	10	30
Nickel *	< 0.00090	0.0023		0.022	0.4	10	40
Lead *	< 0.0017	0.0029		0.027	0.5	10	50
Antimony *	< 0.0020	< 0.0020		< 0.020	0.06	0.7	5
Selenium *	< 0.0050	< 0.0050		< 0.050	0.1	0.5	7
Zinc *	0.0072	0.0051		0.053	4	50	200
Chloride *	16	4.1		50	800	15000	25000
Fluoride*	0.25	0.21		2.1	10	150	500
Sulphate *	14	2.2		31	1000	20000	50000
TDS*	110	41		460	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.16	< 0.13		< 0.50	1	-	-
DOC	9.47	23		217	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.5						
Dry Matter (%)	90						
Moisture (%)	9.9						
Stage 1							
Volume Eluate L2 (litres)	0.326						
Filtered Eluate VE1 (litres)	0.14						

Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited

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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Waste Acceptance Criteria Analytical Results

Report No:	**24-028549**						
					Client:	**ENZYGOGEO**	
Location	**Anchor Springs**						
Lab Reference (Sample Number)	245554				**Landfill Waste Acceptance Criteria Limits**		
Sampling Date	/ /				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	TP2						
Depth (m)	2.00						
Solid Waste Analysis							
TOC (%)**	< 0.1				3%	5%	6%
Loss on Ignition (%) **	1.6				--	--	10%
BTEX (µg/kg)**	< 5.0				6000	--	--
Sum of PCBs (mg/kg)**	< 0.007				1	--	--
Mineral Oil (mg/kg) EH_1D_CU_AL	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.85				100	--	--
pH (units)**	7.4				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	0.49				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 3 preparation utilising end over end leaching procedure)	2:1 mg/l	8:1 mg/l		Cumulative 10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
Arsenic *	0.0039	0.0095		0.091	0.5	2	25
Barium *	0.0056	0.0041		0.042	20	100	300
Cadmium *	< 0.00010	< 0.00010		< 0.0010	0.04	1	5
Chromium *	0.0032	0.0020		0.021	0.5	10	70
Copper *	0.016	0.0061		0.068	2	50	100
Mercury *	< 0.00070	< 0.0007		< 0.0070	0.01	0.2	2
Molybdenum *	0.011	0.0043		0.048	0.5	10	30
Nickel *	0.00092	< 0.00090		< 0.0090	0.4	10	40
Lead *	< 0.0017	< 0.0017		< 0.017	0.5	10	50
Antimony *	< 0.0020	< 0.0020		< 0.020	0.06	0.7	5
Selenium *	< 0.0050	< 0.0050		< 0.050	0.1	0.5	7
Zinc *	0.0043	0.0038		0.038	4	50	200
Chloride *	18	4.2		52	800	15000	25000
Fluoride*	0.45	0.33		3.4	10	150	500
Sulphate *	31	12		130	1000	20000	50000
TDS*	160	73		790	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.16	< 0.13		< 0.50	1	-	-
DOC	13.1	24		230	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.5						
Dry Matter (%)	88						
Moisture (%)	12						
Stage 1							
Volume Eluate L2 (litres)	0.318						
Filtered Eluate VE1 (litres)	0.13						

Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)

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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)

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Waste Acceptance Criteria Analytical Results

Report No:	**24-028549**						
					Client:	**ENZYGOGEO**	
Location	**Anchor Springs**						
Lab Reference (Sample Number)	245555				**Landfill Waste Acceptance Criteria**		
					Limits		
Sampling Date	/ /				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WS1						
Depth (m)	1.00						
Solid Waste Analysis							
TOC (%)**	0.3				3%	5%	6%
Loss on Ignition (%) **	1.8				--	--	10%
BTEX (µg/kg)**	< 5.0				6000	--	--
Sum of PCBs (mg/kg)**	< 0.007				1	--	--
Mineral Oil (mg/kg) EH_1D_CU_AL	< 10				500	--	--
Total PAH (WAC-17) (mg/kg)	< 0.85				100	--	--
pH (units)**	7.6				--	>6	--
Acid Neutralisation Capacity (mmol / kg)	0.73				--	To be evaluated	To be evaluated
Eluate Analysis (BS EN 12457 - 3 preparation utilising end over end leaching procedure)	2:1	8:1		Cumulative 10:1	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)		
	mg/l	mg/l		mg/kg			
Arsenic *	< 0.0020	0.0031		0.030	0.5	2	25
Barium *	0.020	0.0062		0.071	20	100	300
Cadmium *	< 0.00010	< 0.00010		< 0.0010	0.04	1	5
Chromium *	0.00070	0.0015		0.014	0.5	10	70
Copper *	0.019	0.0070		0.078	2	50	100
Mercury *	< 0.00070	< 0.0007		< 0.0070	0.01	0.2	2
Molybdenum *	0.011	0.010		0.10	0.5	10	30
Nickel *	< 0.00090	< 0.00090		< 0.0090	0.4	10	40
Lead *	< 0.0017	< 0.0017		< 0.017	0.5	10	50
Antimony *	< 0.0020	< 0.0020		< 0.020	0.06	0.7	5
Selenium *	< 0.0050	< 0.0050		< 0.050	0.1	0.5	7
Zinc *	0.0089	0.0031		0.035	4	50	200
Chloride *	6.9	< 4.0		32	800	15000	25000
Fluoride*	0.28	0.30		3.0	10	150	500
Sulphate *	76	9.0		140	1000	20000	50000
TDS*	170	40		490	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.16	< 0.13		< 0.50	1	-	-
DOC	11.8	27		255	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	0.5						
Dry Matter (%)	90						
Moisture (%)	9.7						
Stage 1							
Volume Eluate L2 (litres)	0.327						
Filtered Eluate VE1 (litres)	0.13						

Results are expressed on a dry weight basis, after correction for moisture content where applicable. *= UKAS accredited (liquid eluate analysis only)

Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation ** = MCERTS accredited

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 : 24-028549
Project / Site name: Anchor Springs

* 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 *
245553	TP1	None Supplied	0.5	Brown clay and sand with gravel
245554	TP2	None Supplied	2	Brown clay and sand with gravel
245555	WS1	None Supplied	1	Brown clay

Analytical Report Number : 24-028549
Project / Site name: Anchor Springs

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
pH at 20°C in soil	Determination of pH in soil by addition of water followed by electrometric measurement	In-house method	L005B	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
Total organic carbon in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L023B	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with hexane followed by GC-MS	In-house method based on USEPA 8082	L027B	D	MCERTS
TDS in WAC leachate (BS EN 12457-3 Prep)	Determination of total dissolved solids in leachate by electrometric measurement	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L031B	W	ISO 17025
Fluoride in WAC leachate (BS EN 12457-3 Prep)	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L033B	W	ISO 17025
DOC in WAC leachate (BS EN 12457-3 Prep)	Determination of dissolved organic carbon in leachate by TOC/DOC NDIR analyser	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed.	L037B	W	NONE
Metals in WAC leachate (BS EN 12457-3 Prep)	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed	L039B	W	ISO 17025
Sulphate in WAC leachate (BS EN 12457-3 Prep)	Determination of sulphate in leachate by acidification followed by ICP-OES	In-house method based on Standard Methods for the Examination of Water and Waste Water, 21st Ed	L039B	W	ISO 17025
Preparation WAC leachate		In-house method	L043B	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	L046B	W	NONE
Loss on ignition of soil @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	In-house method	L047	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS

Analytical Report Number : 24-028549
Project / Site name: Anchor Springs

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 petroleum hydrocarbons by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS	In-house method	L076B/L088	D/W	NONE
Phenol Index in WAC leachate (BS EN 12457-3 Prep)	Determination of monohydric phenols in leachate by continuous flow analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	ISO 17025
Chloride in WAC leachate (BS EN 12457-3 Prep)	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' 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 - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

Appendix 4 - Geotechnical Testing Results

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6

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

4041

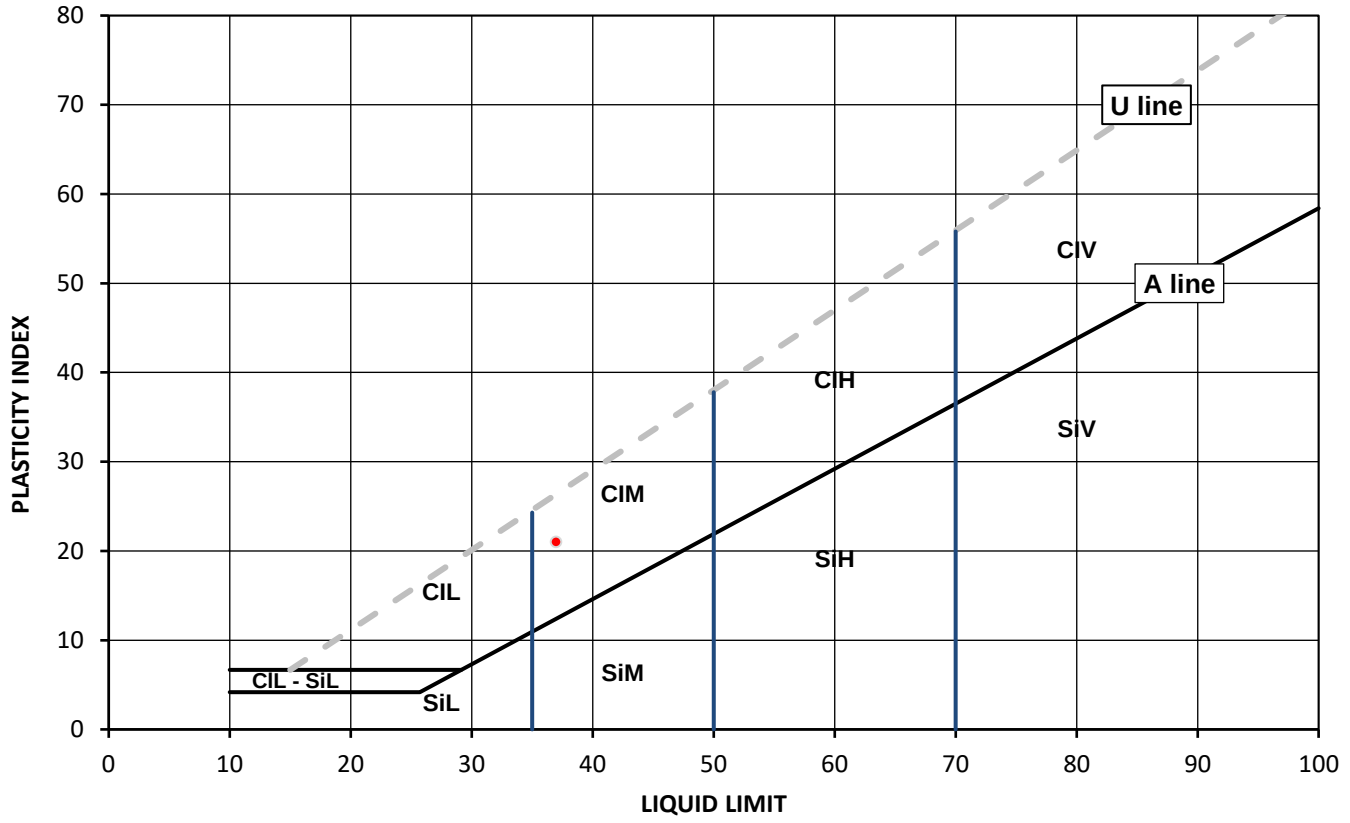
Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	247418	Depth Top [m]:	1.00
Hole No.:	WS1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Yellowish brown sandy CLAY		
Sample Preparation:	Tested in natural condition; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
18.2	37	16	21	0.10	0.90	100



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

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

Signed: [redacted]

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 337.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6

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

4041

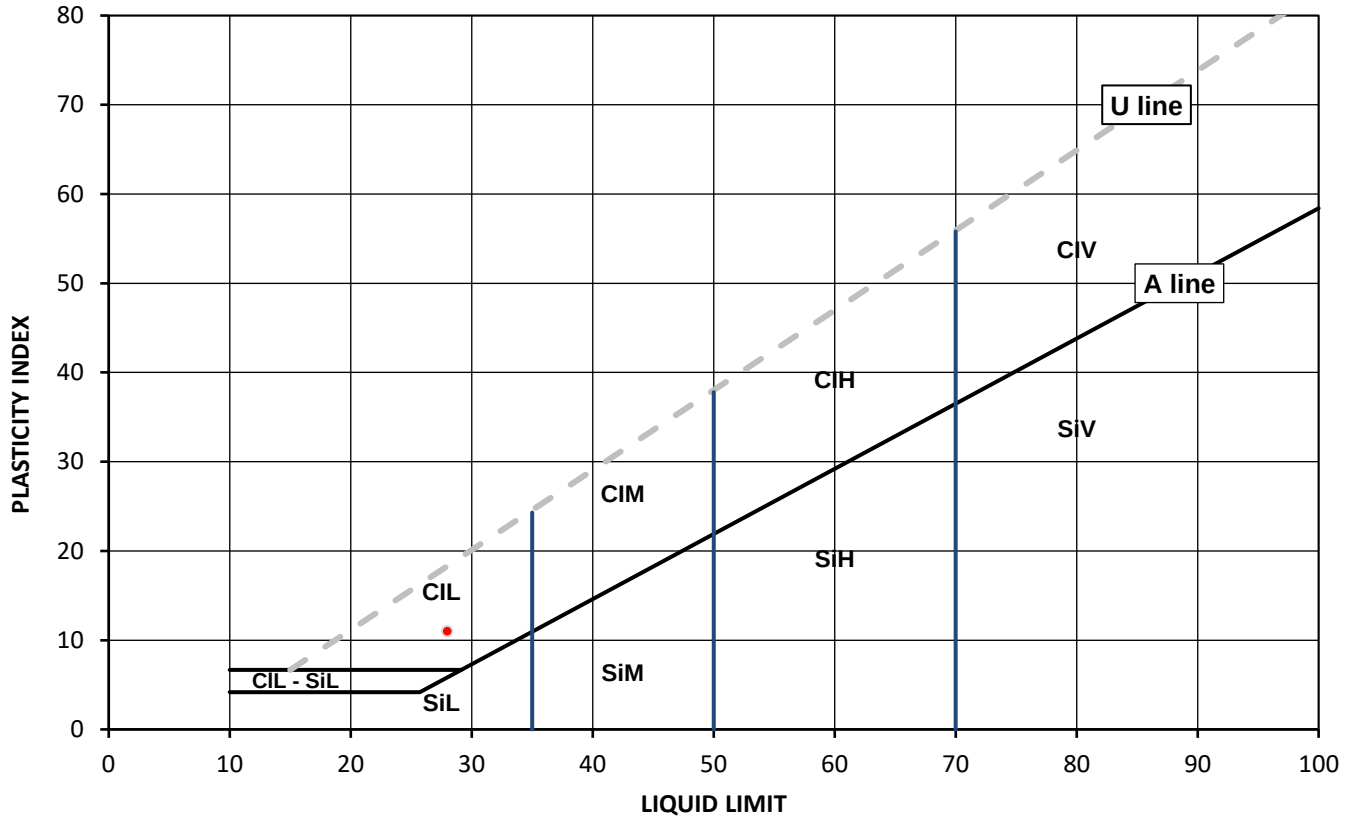
Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	247420	Depth Top [m]:	2.00
Hole No.:	TP1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly very sandy CLAY with fragments of chalk		
Sample Preparation:	Tested after >0.425mm removed by hand; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
22.7	28	17	11	0.55	0.45	99



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

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

Signed: [redacted]

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 337.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS EN ISO 17892-12:2018+A2:2022, cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6

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

4041

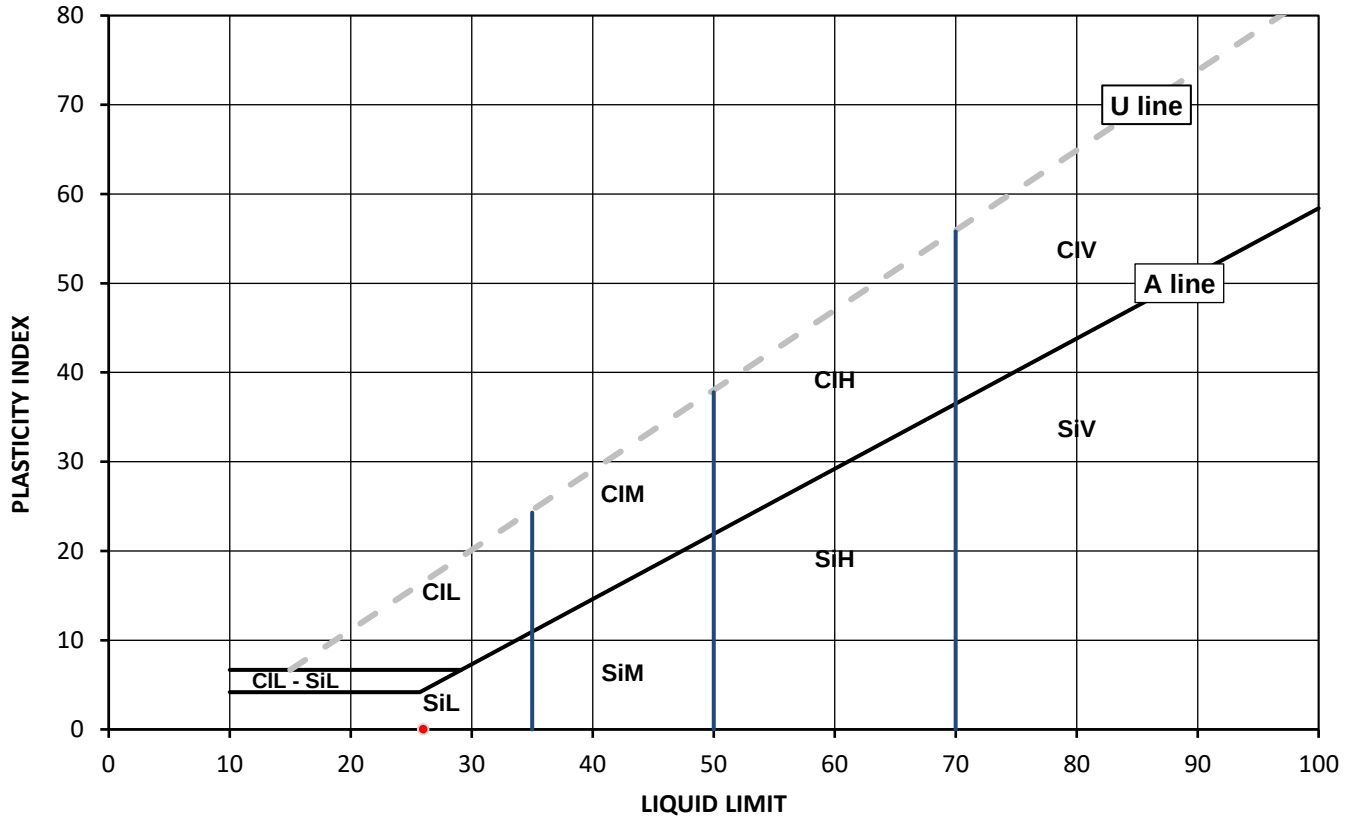
Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	247421	Depth Top [m]:	1.00
Hole No.:	TP2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly clayey SAND		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
8.4	26	NP	NP	N/A	N/A	72



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

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks: NP - non plastic.

Signed: [redacted]

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 337.13

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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

4041

Client: Enzygo Geoenvironmental Ltd

Client Address: Ducie House, Ducie Street, M1 2JW

Contact: Reuben Fisher

Site Address: Anchor Springs

BS EN ISO 17892-12:2018+A2:2022 cl 5.3 and 5.5, Fall Cone Method, 4 Pt Test, BS 1377-2:2022, cl 5.2 and 6. W by BS EN ISO 17892-1:2014+A1:2022.

Client Reference: SHF.1995.004
Job Number: 24-028610-1
Date Sampled: Not Given
Date Received: 01/07/2024
Date Tested: 08/07/2024
Sampled By: Not Given

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top m	Depth Base m	Type			%	% Passing 425um %	WL* %	Correlation Factor	Wp %	Ip %	Cone type	Sample Preparation	bulk Mg/m3	dry Mg/m3	PD Mg/m3
247418	WS1	Not Given	1.00	Not Given	D	Yellowish brown sandy CLAY	Atterberg 4 Point	18.2	100	37	-	16	21	80g/30 deg	N / I			
247420	TP1	Not Given	2.00	Not Given	D	Brown slightly gravelly very sandy CLAY with fragments of chalk	Atterberg 4 Point	22.7	99	28	-	17	11	80g/30 deg	R / I			
247421	TP2	Not Given	1.00	Not Given	D	Brown slightly gravelly clayey SAND	Atterberg 4 Point	8.4	72	26	-	NP	NP	80g/30 deg	W / I			

Note: # Non accredited; NP - Non plastic; N - Tested in natural condition, R - Tested after >0,425mm removed by hand, W - Tested after washing to remove >425mm; I - The water content in the sample was increased , D - The water content in the sample was decreased; * - One point liquid limit corrected as per the report Correlation Factor by Clayton C.R.I and Jukes A.W (1978)

Comments:

Signed: [redacted]

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024 **GF 362.15**

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

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

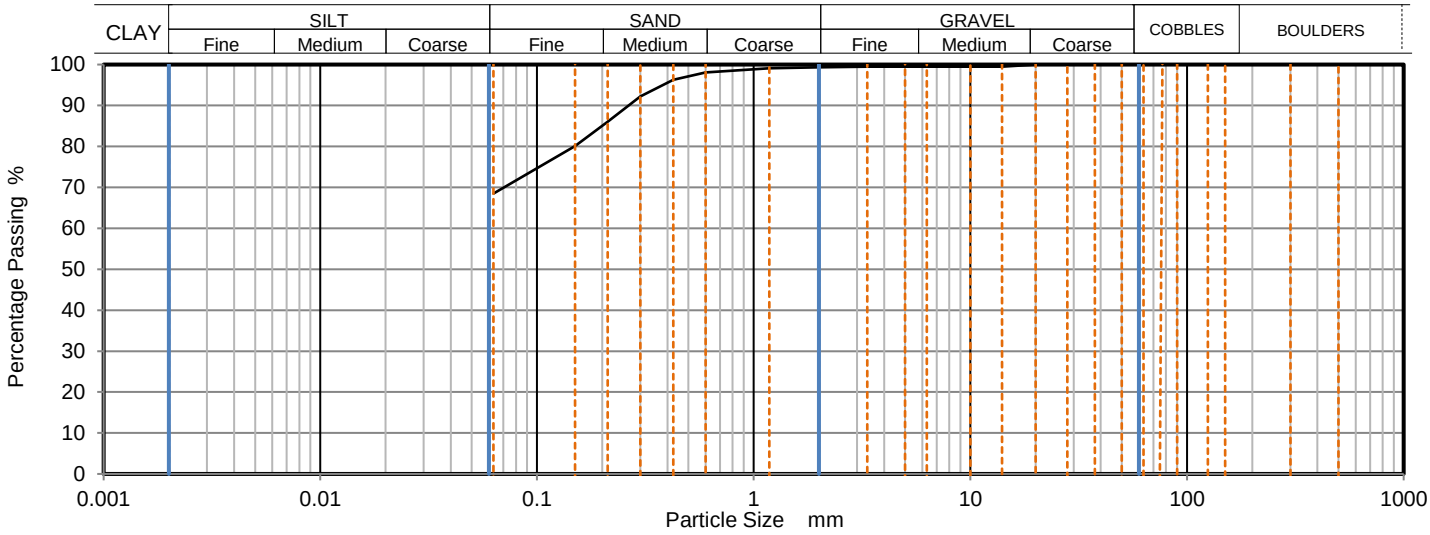
4041

Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	245961	Depth Top [m]:	1.00
Hole No.:	TP1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Yellowish brown slightly sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	98		
0.425	96		
0.3	92		
0.212	86		
0.15	80		
0.063	69		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	1.00
Sand	31.00
Fines <0.063 mm	68.00

Grading Analysis		
D100	mm	20
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

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

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed: [redacted]

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

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

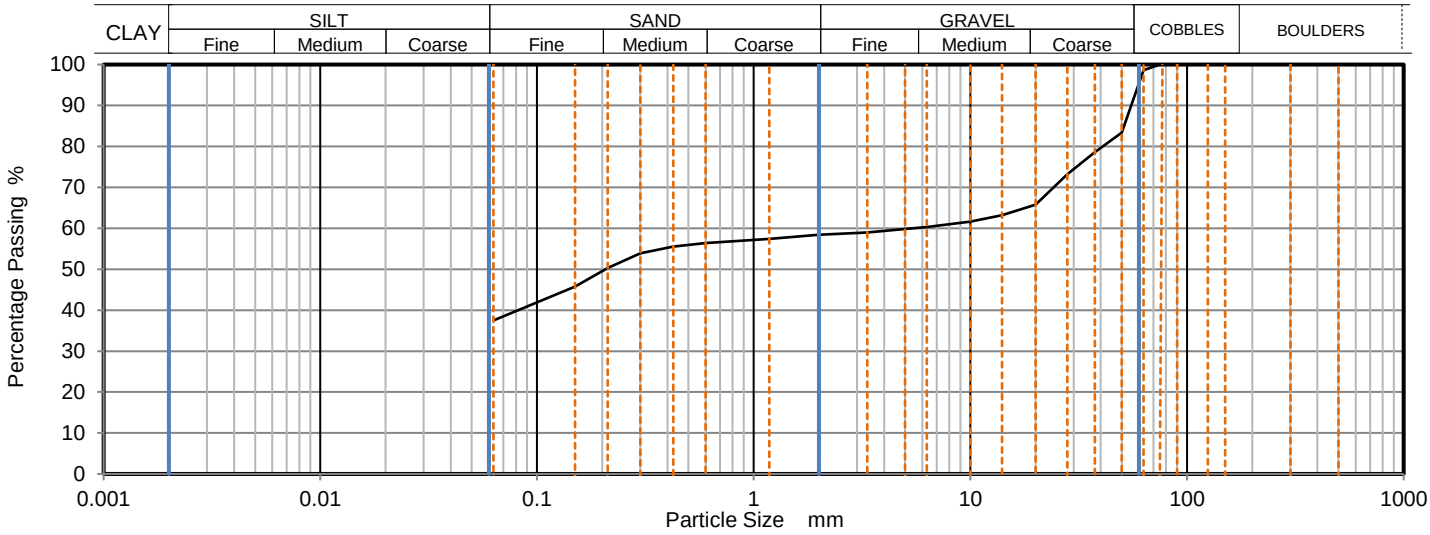
4041

Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	245962	Depth Top [m]:	2.00
Hole No.:	TP1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Light brown slightly sandy gravelly CLAY with limestone		
Sample Preparation:	Sample was whole tested, oven dried at 109.0 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	99		
50	83		
37.5	79		
28	73		
20	66		
14	63		
10	62		
6.3	60		
5	60		
3.35	59		
2	58		
1.18	57		
0.6	56		
0.425	56		
0.3	54		
0.212	50		
0.15	46		
0.063	38		

Sample Proportions	% dry mass
Very coarse	1.00
Gravel	40.00
Sand	21.00
Fines <0.063 mm	38.00

Grading Analysis		
D100	mm	75
D60	mm	5.48
D30	mm	
D10	mm	
Uniformity Coefficient		87
Curvature Coefficient		

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

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.

Signed: [redacted]

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

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

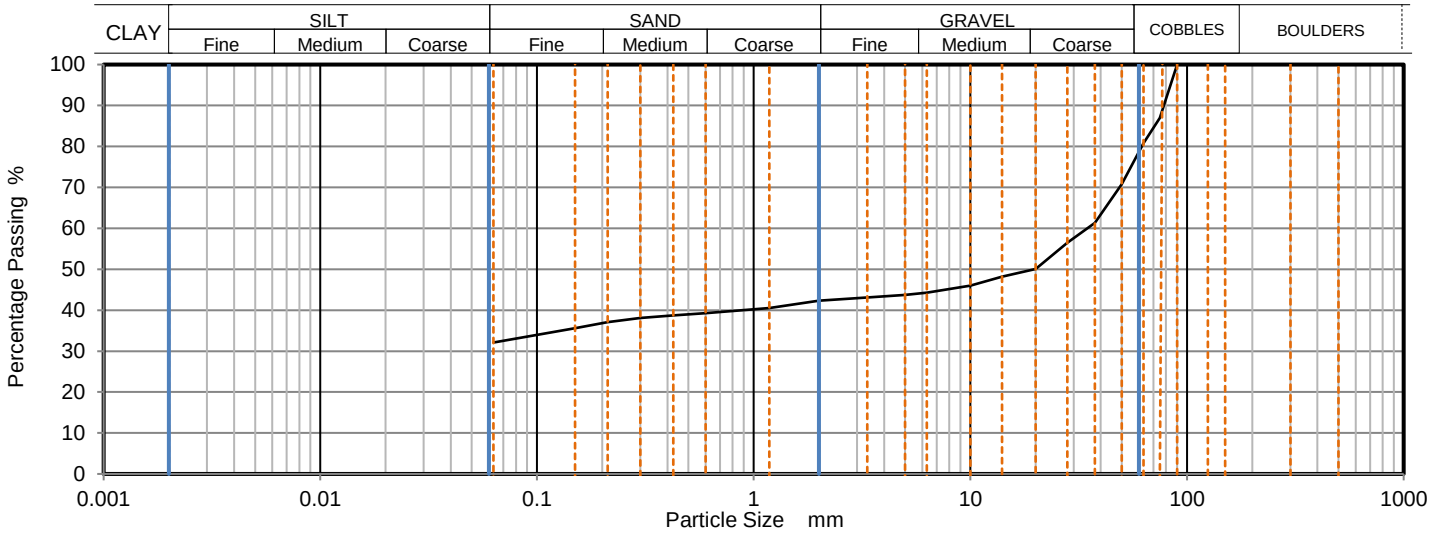
4041

Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	245963	Depth Top [m]:	3.00
Hole No.:	TP1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Creamy CHALK		
Sample Preparation:	Sample was whole tested, oven dried at 108.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	87		
63	81		
50	71		
37.5	61		
28	57		
20	50		
14	48		
10	46		
6.3	44		
5	44		
3.35	43		
2	42		
1.18	41		
0.6	39		
0.425	39		
0.3	38		
0.212	37		
0.15	36		
0.063	32		

Sample Proportions	% dry mass
Very coarse	19.00
Gravel	39.00
Sand	10.00
Fines <0.063 mm	32.00

Grading Analysis		
D100	mm	90
D60	mm	34.7
D30	mm	
D10	mm	
Uniformity Coefficient		550
Curvature Coefficient		

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

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.

Signed:

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

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

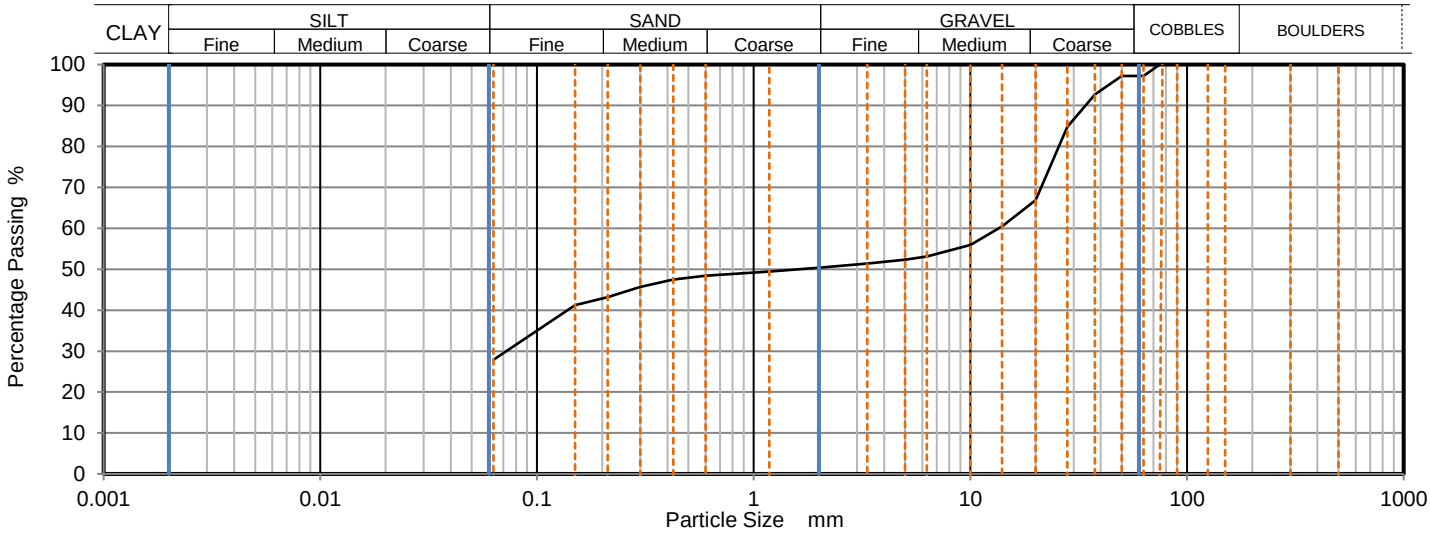
4041

Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	245964	Depth Top [m]:	1.00
Hole No.:	TP2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown very sandy very clayey GRAVEL		
Sample Preparation:	Sample was quartered, oven dried at 108.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	97		
50	97		
37.5	93		
28	85		
20	67		
14	61		
10	56		
6.3	53		
5	52		
3.35	51		
2	50		
1.18	49		
0.6	48		
0.425	48		
0.3	46		
0.212	43		
0.15	41		
0.063	28		

Sample Proportions	% dry mass
Very coarse	3.00
Gravel	47.00
Sand	22.00
Fines <0.063 mm	28.00

Grading Analysis		
D100	mm	75
D60	mm	13.5
D30	mm	0.072
D10	mm	
Uniformity Coefficient		210
Curvature Coefficient		

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

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed: [redacted]

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

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

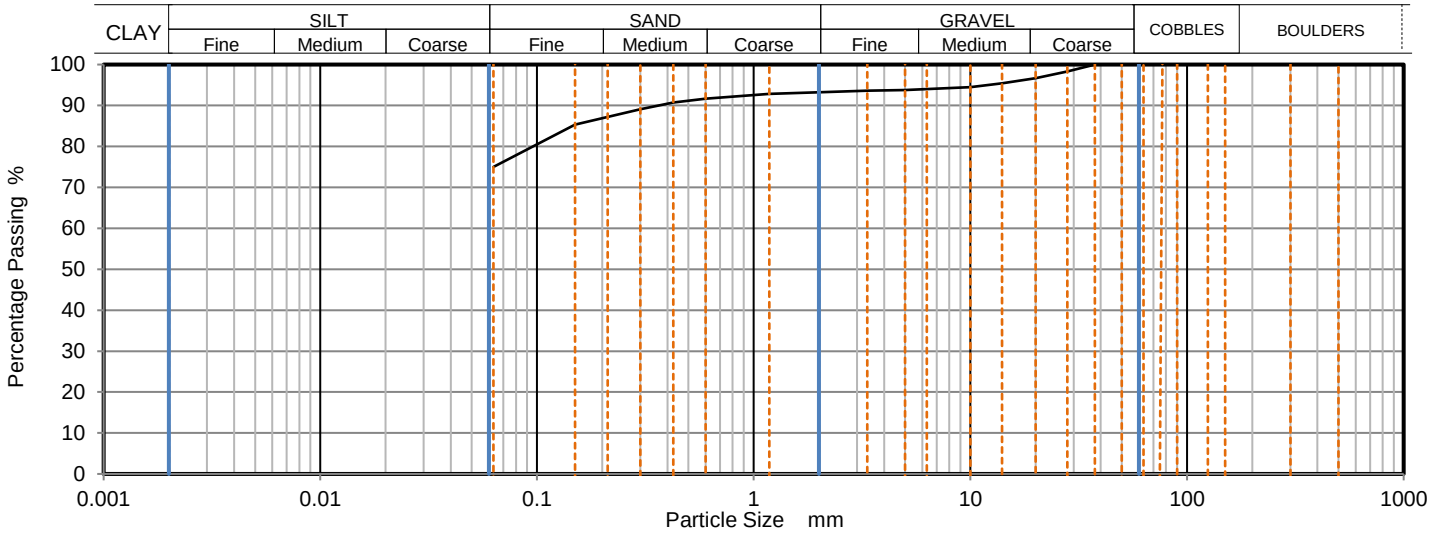
4041

Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	245965	Depth Top [m]:	2.00
Hole No.:	TP2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Yellowish brown slightly gravelly slightly sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	98		
20	97		
14	95		
10	95		
6.3	94		
5	94		
3.35	94		
2	93		
1.18	93		
0.6	92		
0.425	91		
0.3	89		
0.212	87		
0.15	85		
0.063	75		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	7.00
Sand	18.00
Fines <0.063 mm	75.00

Grading Analysis		
D100	mm	37.5
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

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

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed: [redacted]

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

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

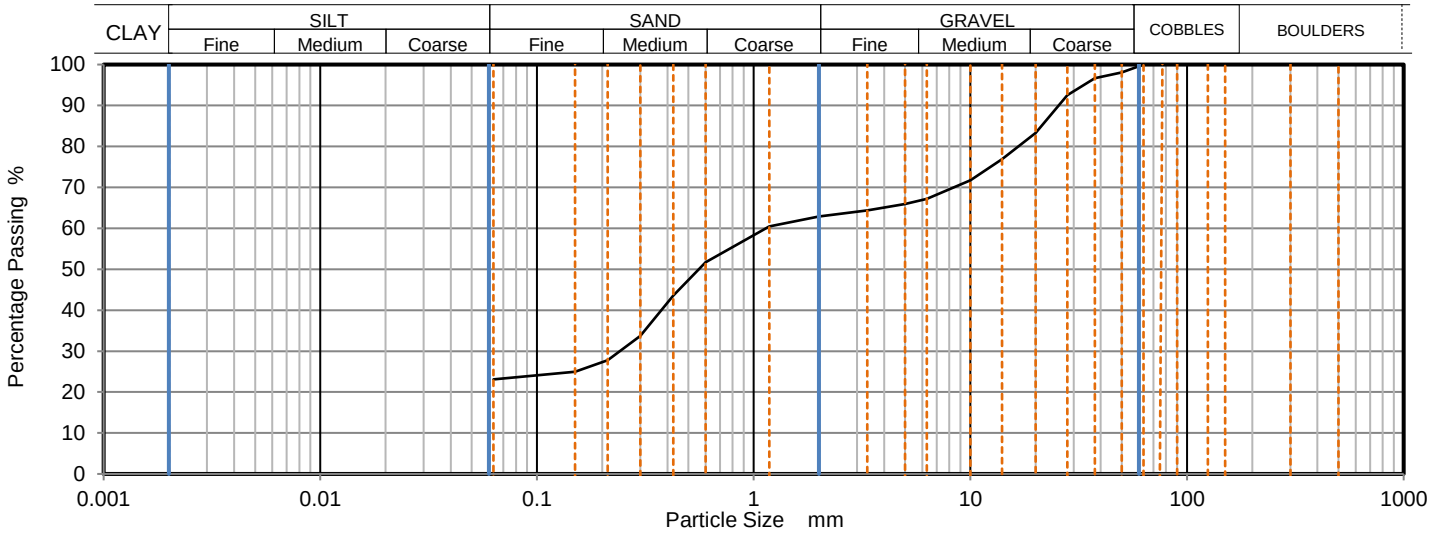
4041

Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	245966	Depth Top [m]:	3.00
Hole No.:	TP2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown gravelly sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 109.0 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	98		
37.5	97		
28	93		
20	83		
14	77		
10	72		
6.3	67		
5	66		
3.35	64		
2	63		
1.18	61		
0.6	52		
0.425	44		
0.3	34		
0.212	28		
0.15	25		
0.063	23		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	37.00
Sand	40.00
Fines <0.063 mm	23.00

Grading Analysis		
D100	mm	63
D60	mm	1.14
D30	mm	0.242
D10	mm	
Uniformity Coefficient		18
Curvature Coefficient		

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

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks:

Signed:

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

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

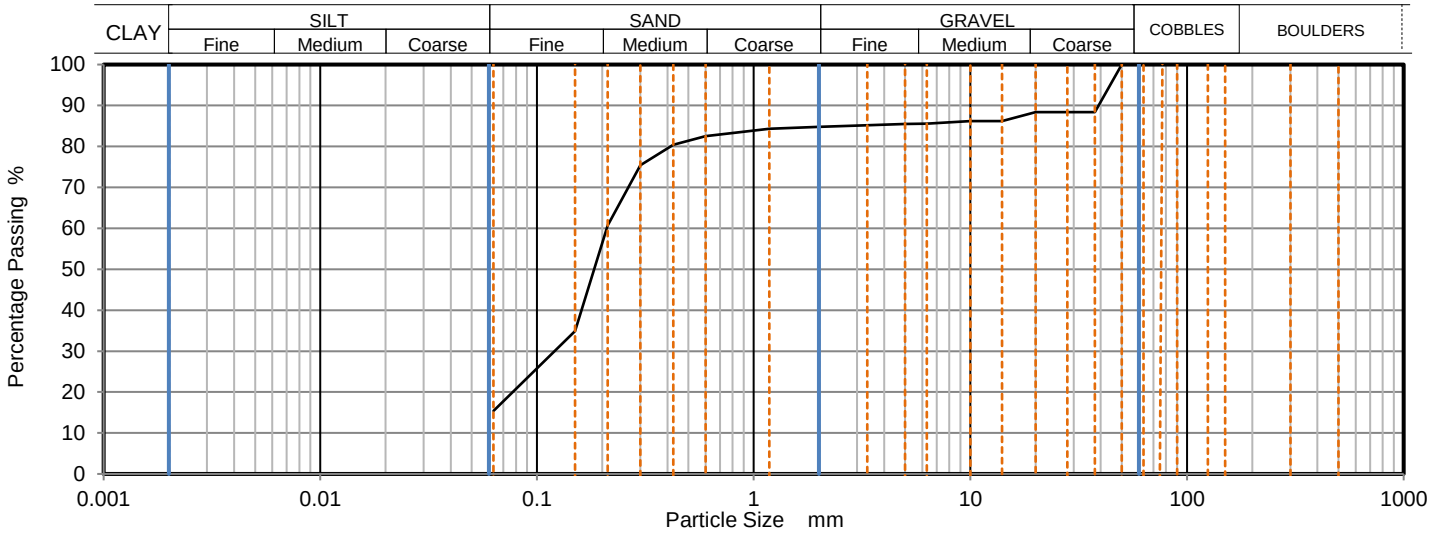
4041

Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	247419	Depth Top [m]:	2.80
Hole No.:	WS1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Yellowish brown clayey gravelly SAND with fragments flintstone		
Sample Preparation:	Sample was quartered, oven dried at 108.6 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	88		
20	88		
14	86		
10	86		
6.3	86		
5	86		
3.35	85		
2	85		
1.18	84		
0.6	83		
0.425	80		
0.3	75		
0.212	61		
0.15	35		
0.063	15		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	15.00
Sand	70.00
Fines <0.063 mm	15.00

Grading Analysis		
D100	mm	50
D60	mm	0.21
D30	mm	0.121
D10	mm	
Uniformity Coefficient		3.3
Curvature Coefficient		

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

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.

Signed: [redacted]

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

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

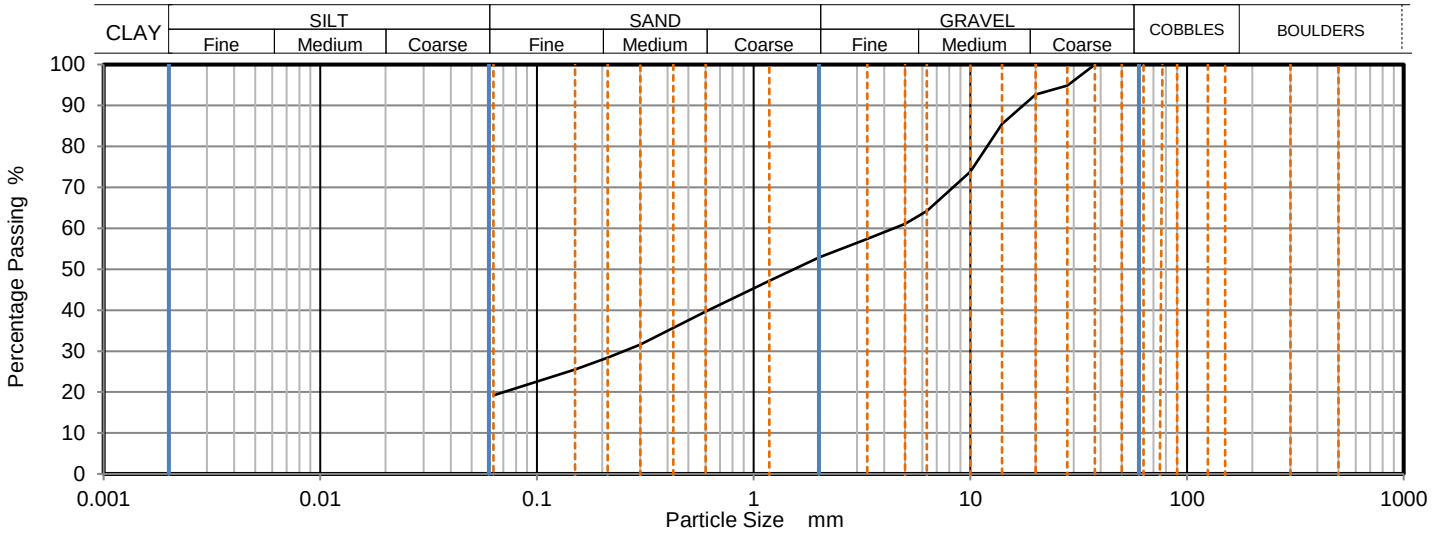
4041

Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	247422	Depth Top [m]:	0.30
Hole No.:	WS11	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Light brown clayey very sandy GRAVEL		
Sample Preparation:	Sample was quartered, oven dried at 108.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	93		
14	86		
10	74		
6.3	64		
5	61		
3.35	57		
2	53		
1.18	47		
0.6	40		
0.425	36		
0.3	32		
0.212	28		
0.15	26		
0.063	19		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	47.00
Sand	34.00
Fines <0.063 mm	19.00

Grading Analysis		
D100	mm	37.5
D60	mm	4.43
D30	mm	0.252
D10	mm	
Uniformity Coefficient		70
Curvature Coefficient		

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

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.

Signed: [redacted]

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

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

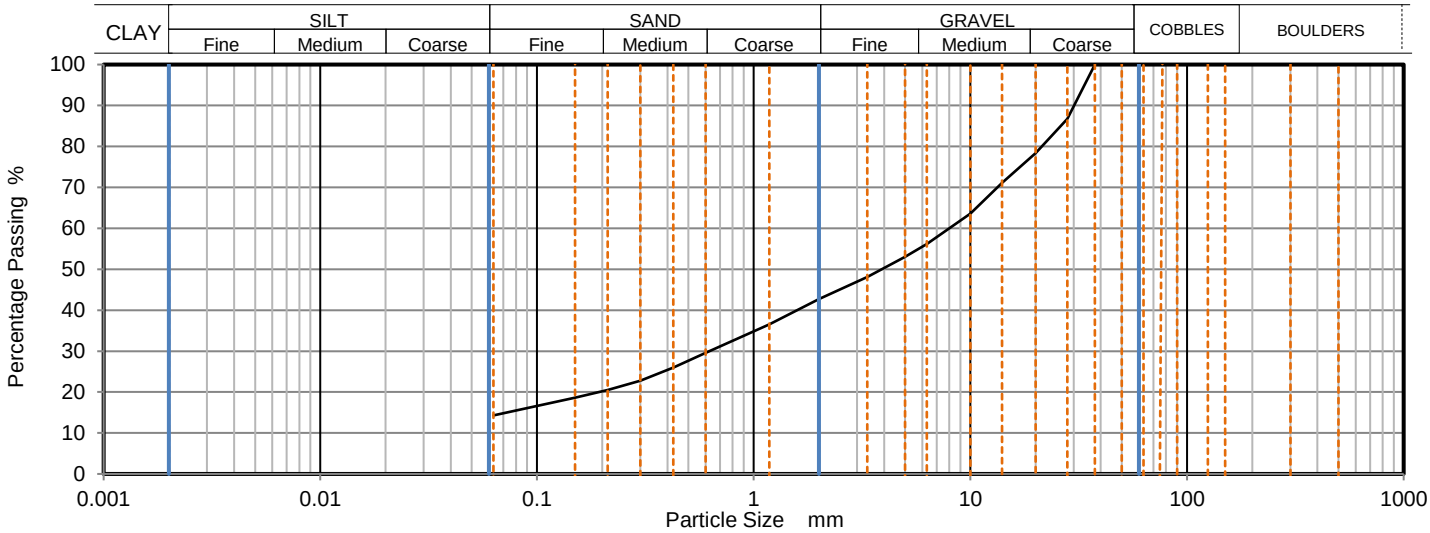
4041

Client:	Enzygo Geoenvironmental Ltd	Client Reference:	SHF.1995.004
Client Address:	Ducie House, Ducie Street, M1 2JW	Job Number:	24-028610-1
		Date Sampled:	Not Given
		Date Received:	01/07/2024
Contact:	Reuben Fisher	Date Tested:	08/07/2024
Site Address:	Anchor Springs	Sampled By:	Not Given

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

Test Results:

Laboratory Reference:	247423	Depth Top [m]:	0.30
Hole No.:	WS13	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Light brown clayey very sandy GRAVEL		
Sample Preparation:	Sample was quartered, oven dried at 108.6 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	87		
20	78		
14	71		
10	64		
6.3	56		
5	53		
3.35	48		
2	43		
1.18	37		
0.6	30		
0.425	26		
0.3	23		
0.212	21		
0.15	19		
0.063	14		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	58.00
Sand	28.00
Fines <0.063 mm	14.00

Grading Analysis		
D100	mm	37.5
D60	mm	7.99
D30	mm	0.625
D10	mm	
Uniformity Coefficient		130
Curvature Coefficient		

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

Note: Tested in Accordance with ISO 17892 -4, by sieving on as received or wet sample

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS EN ISO 17892-4:2016 Table 1.

Signed: [redacted]

Katarzyna Koziel
Senior Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 18/07/2024

GF 366.11

Enzygo Geoenvironmental Ltd
Ducie House
Ducie Street
M1 2JW

e: Reuben.Fisher@enzygo.com

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

[redacted]m

Analytical Report Number : 24-028877

Project / Site name:	Anchor Springs	**Samples received on:**	01/07/2024
Your job number:	SHF.1995.004	**Samples instructed on/ Analysis started on:**	02/07/2024
Your order number:	SHF.1995.004	**Analysis completed by:**	11/07/2024
Report Issue Number:	1	**Report issued on:**	11/07/2024
Samples Analysed:	2 soil samples		

[redacted]

Signed:

Joanna Wawrzeczko
Senior 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.

Analytical Report Number: 24-028877
Project / Site name: Anchor Springs
Your Order No: SHF.1995.004

Lab Sample Number				247424	247425
Sample Reference				WS1	TP1
Sample Number				None Supplied	None Supplied
Depth (m)				2.00	3.00
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	61
Moisture Content	%	0.01	NONE	9.1	20
Total mass of sample received	kg	0.1	NONE	0.6	0.7
General Inorganics					
pH (L099)	pH Units	N/A	MCERTS	7.9	8.3
Total Sulphate as SO_4	%	0.005	MCERTS	0.02	0.078
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	130	110
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	64.7	55.8
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	4.8	19
Total Sulphur	mg/kg	50	MCERTS	84	240
Total Sulphur	%	0.005	MCERTS	0.008	0.024
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	< 0.05
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	8.9	< 2.0
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	4.8	< 2.0
Heavy Metals / Metalloids					
Magnesium (leachate equivalent)	mg/l	2.5	NONE	8.7	5.7
Magnesium (water soluble)	mg/kg	5	NONE	18	12

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-028877
Project / Site name: Anchor Springs

* 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 *
247424	WS1	None Supplied	2	Brown clay and sand with gravel
247425	TP1	None Supplied	3	Brown clay and sand with gravel and stones

Analytical Report Number : 24-028877
Project / Site name: Anchor Springs

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 (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
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	L038B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' 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.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

Sample Deviation Report

Analytical Report Number : 24-028877

Project / Site name: Anchor Springs

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.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP1	N/A	S	247425	a	Ammonium as NH4 in soil	L082B	a
TP1	N/A	S	247425	a	Chloride, water soluble, in soil	L082B	a
TP1	N/A	S	247425	a	Magnesium, water soluble, in soil	L038B	a
TP1	N/A	S	247425	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
TP1	N/A	S	247425	a	Total Sulphur in soil	L038B	a
TP1	N/A	S	247425	a	Total sulphate (as SO4 in soil)	L038B	a
TP1	N/A	S	247425	a	Water Soluble Nitrate (2:1) as N in soil	L078	a
TP1	N/A	S	247425	a	Water Soluble Nitrate (2:1) as N in soil	L078B	a
TP1	N/A	S	247425	a	pH in soil (automated)	L099	a
WS1	N/A	S	247424	a	Ammonium as NH4 in soil	L082B	a
WS1	N/A	S	247424	a	Chloride, water soluble, in soil	L082B	a
WS1	N/A	S	247424	a	Magnesium, water soluble, in soil	L038B	a
WS1	N/A	S	247424	a	Sulphate, water soluble, in soil (16hr extraction)	L038B	a
WS1	N/A	S	247424	a	Total Sulphur in soil	L038B	a
WS1	N/A	S	247424	a	Total sulphate (as SO4 in soil)	L038B	a
WS1	N/A	S	247424	a	Water Soluble Nitrate (2:1) as N in soil	L078	a
WS1	N/A	S	247424	a	Water Soluble Nitrate (2:1) as N in soil	L078B	a
WS1	N/A	S	247424	a	pH in soil (automated)	L099	a

Appendix 5 - Human Health Assessment Reference Values

Determinant	Units	GAC Value Residential					
		With Plant Uptake			Without Plant Uptake		
Arsenic	mg/kg	37			40		
Cadmium	mg/kg	11			85		
Chromium	mg/kg	910			910		
Chromium VI	mg/kg	6			6		
Lead	mg/kg	200			310		
Mercury	mg/kg	40			56		
Nickel	mg/kg	130			180		
Selenium	mg/kg	250			430		
Copper	mg/kg	2400			7100		
Zinc	mg/kg	3700			40000		
Cyanide	mg/kg	791			800		
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	280	550	1100	750	1300	2300
Napthalene	mg/kg	2.3	5.6	13	2.3	5.6	13
Acenaphtylene	mg/kg	170	420	920	2900	4600	6000
Acenaphthene	mg/kg	210	510	1100	3000	4700	6000
Flourene	mg/kg	170	400	860	2800	3800	4500
Phenanthrene	mg/kg	95	220	440	1300	1500	1500
Anthracene	mg/kg	2400	5400	11000	31000	35000	37000
Fluoranthene	mg/kg	280	560	890	1500	1600	1600
Pyrene	mg/kg	620	1200	2000	3700	3800	3800
Benzo(a)Anthracene	mg/kg	7.2	11	13	11	14	15
Chrysene	mg/kg	15	22	27	30	31	32
Benzo(b)Flouranthene	mg/kg	2.6	3.3	3.7	3.9	4.0	4.0
Benzo(k)Flouranthene	mg/kg	77	93	100	110	110	110
Benzo(a)Pyrene	mg/kg	2.2	2.7	3.0	3.2	3.2	3.2
Indeno(123-cd)Pyrene	mg/kg	27	36	41	45	46	46
Dibenzo(a,h)Anthracene	mg/kg	0.24	0.28	0.3	0.31	0.32	0.32
Benzo(ghi)Perylene	mg/kg	320	340	350	360	360	360
TPH C_5-C_6 Aliphatic	mg/kg	42	78	160	42	78	160
TPH C_6-C_8 Aliphatic	mg/kg	100	230	530	100	230	530
TPH C_8-C_{10} Aliphatic	mg/kg	27	65	150	27	65	150
TPH C_{10}-C_{12} Aliphatic	mg/kg	130	330	760	130	330	770
TPH C_{12}-C_{16} Aliphatic	mg/kg	1100	2400	4300	1100	2400	4400
TPH C_{16}-C_{35} Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000
TPH C_{35}-C_{44} Aliphatic	mg/kg	65000	92000	110000	65000	92000	110000
TPH C_5-C_7 Aromatic	mg/kg	70	140	300	370	690	1400
TPH C_7-C_8 Aromatic	mg/kg	130	290	660	860	1800	3900
TPH C_8-C_{10} Aromatic	mg/kg	34	83	190	47	110	270
TPH C_{10}-C_{12} Aromatic	mg/kg	74	180	380	250	590	1200
TPH C_{12}-C_{16} Aromatic	mg/kg	140	330	660	1800	2300	2500
TPH C_{16}-C_{21} Aromatic	mg/kg	260	540	930	1900	1900	1900
TPH C_{21}-C_{35} Aromatic	mg/kg	1100	1500	1700	1900	1900	1900
TPH C_{35}-C_{44} Aromatic	mg/kg	1100	1500	1700	1900	1900	1900
Benzene	mg/kg	0.087	0.17	0.37	0.38	0.70	1.4
Toluene	mg/kg	130	290	660	880	1900	3900
Ethylebenzene	mg/kg	47	110	260	83	190	440
Xylene	mg/kg	56	130	310	79	180	430

Determinant	Units	GAC Value					
		Residential POS			Commercial		
Arsenic	mg/kg	79			640		
Cadmium	mg/kg	120			190		
Chromium	mg/kg	1500			8600		
Chromium VI	mg/kg	7.7			33		
Lead	mg/kg	630			2330		
Mercury	mg/kg	120			1100		
Nickel	mg/kg	230			980		
Selenium	mg/kg	1100			12000		
Copper	mg/kg	12000			68000		
Zinc	mg/kg	81000			730000		
Cyanide	mg/kg	N/A			16200		
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	760	1500	3200	760	1500	3200
Napthalene	mg/kg	4900	4900	4900	190	460	1100
Acenaphtylene	mg/kg	15000	15000	15000	83000	97000	100000
Acenaphthene	mg/kg	15000	15000	15000	84000	97000	100000
Flourene	mg/kg	9900	9900	9900	63000	68000	71000
Phenanthrene	mg/kg	3100	3100	3100	22000	22000	23000
Anthracene	mg/kg	74000	74000	74000	520000	540000	540000
Fluoranthene	mg/kg	3100	3100	3100	23000	23000	23000
Pyrene	mg/kg	7400	7400	7400	54000	54000	54000
Benzo(a)Anthracene	mg/kg	29	29	29	170	170	180
Chrysene	mg/kg	57	57	57	350	350	350
Benzo(b)Flouranthene	mg/kg	7.1	7.2	7.2	44	44	45
Benzo(k)Flouranthene	mg/kg	190	190	190	1200	1200	1200
Benzo(a)Pyrene	mg/kg	5.7	5.7	5.7	35	35	36
Indeno(123-cd)Pyrene	mg/kg	82	82	82	500	510	510
Dibenzo(a,h)Anthracene	mg/kg	0.57	0.57	0.58	3.5	3.6	3.6
Benzo(ghi)Perylene	mg/kg	640	640	640	3900	4000	4000
TPH C_5-C_6 Aliphatic	mg/kg	570000	590000	600000	3200	5900	12000
TPH C_6-C_8 Aliphatic	mg/kg	600000	610000	620000	7800	17000	40000
TPH C_8-C_{10} Aliphatic	mg/kg	13000	13000	13000	2000	4800	11000
TPH C_{10}-C_{12} Aliphatic	mg/kg	13000	13000	13000	9700	23000	47000
TPH C_{12}-C_{16} Aliphatic	mg/kg	13000	13000	13000	59000	82000	90000
TPH C_{16}-C_{35} Aliphatic	mg/kg	250000	250000	250000	1600000	1700000	1800000
TPH C_{35}-C_{44} Aliphatic	mg/kg	250000	250000	250000	1600000	1700000	1800000
TPH C_5-C_7 Aromatic	mg/kg	56000	56000	56000	26000	46000	86000
TPH C_7-C_8 Aromatic	mg/kg	56000	56000	56000	56000	110000	180000
TPH C_8-C_{10} Aromatic	mg/kg	5000	5000	5000	3500	8100	17000
TPH C_{10}-C_{12} Aromatic	mg/kg	5000	5000	5000	16000	28000	34000
TPH C_{12}-C_{16} Aromatic	mg/kg	5100	5100	5000	36000	37000	38000
TPH C_{16}-C_{21} Aromatic	mg/kg	3800	3800	3800	28000	28000	28000
TPH C_{21}-C_{35} Aromatic	mg/kg	3800	3800	3800	28000	28000	28000
TPH C_{35}-C_{44} Aromatic	mg/kg	3800	3800	3800	28000	28000	28000
Benzene	mg/kg	72	72	73	27	47	90
Toluene	mg/kg	56000	56000	56000	56000	110000	180000
Ethylebenzene	mg/kg	24000	24000	25000	5700	13000	27000
Xylene	mg/kg	41000	42000	43000	5900	14000	30000

Determinant	Units	GAC Value					
		Park POS			Allotments		
Arsenic	mg/kg	170			43		
Cadmium	mg/kg	532			1.9		
Chromium	mg/kg	33000			18000		
Chromium VI	mg/kg	220			1.8		
Lead	mg/kg	1300			80		
Mercury	mg/kg	240			19		
Nickel	mg/kg	800			53		
Selenium	mg/kg	1800			88		
Copper	mg/kg	44000			520		
Zinc	mg/kg	170000			620		
Cyanide	mg/kg						
SOM	%	1	2.5	6	1	2.5	6
Phenol	mg/kg	760	1500	3200	66	140	280
Napthalene	mg/kg	1200	1900	3000	4.1	10	24
Acenaphtylene	mg/kg	29000	30000	30000	28	69	160
Acenaphthene	mg/kg	29000	30000	30000	34	85	200
Flourene	mg/kg	20000	20000	20000	27	67	160
Phenanthrene	mg/kg	6200	6200	6300	15	38	90
Anthracene	mg/kg	150000	150000	150000	380	950	2200
Fluoranthene	mg/kg	6300	6300	6400	52	130	290
Pyrene	mg/kg	15000	15000	15000	110	270	620
Benzo(a)Anthracene	mg/kg	49	56	62	2.9	6.5	13
Chrysene	mg/kg	93	110	120	4.1	9.4	19
Benzo(b)Flouranthene	mg/kg	13	15	16	0.99	2.1	3.9
Benzo(k)Flouranthene	mg/kg	370	410	440	37	75	130
Benzo(a)Pyrene	mg/kg	11	12	13	0.97	2.0	3.5
Indeno(123-cd)Pyrene	mg/kg	150	170	180	9.5	21	39
Dibenzo(a,h)Anthracene	mg/kg	1.1	1.3	1.4	0.14	0.27	0.43
Benzo(ghi)Perylene	mg/kg	1400	1500	1600	290	470	640
TPH C_5-C_6 Aliphatic	mg/kg	95000	130000	180000	730	1700	3900
TPH C_6-C_8 Aliphatic	mg/kg	150000	220000	320000	2300	5600	13000
TPH C_8-C_{10} Aliphatic	mg/kg	14000	18000	21000	320	770	1700
TPH C_{10}-C_{12} Aliphatic	mg/kg	21000	23000	24000	2200	4400	7300
TPH C_{12}-C_{16} Aliphatic	mg/kg	25000	25000	26000	11000	13000	13000
TPH C_{16}-C_{35} Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000
TPH C_{35}-C_{44} Aliphatic	mg/kg	450000	480000	490000	260000	270000	270000
TPH C_5-C_7 Aromatic	mg/kg	76000	84000	92000	13	27	57
TPH C_7-C_8 Aromatic	mg/kg	87000	95000	100000	22	51	120
TPH C_8-C_{10} Aromatic	mg/kg	7200	8500	9300	8.6	21	51
TPH C_{10}-C_{12} Aromatic	mg/kg	9200	9700	10000	13	31	74
TPH C_{12}-C_{16} Aromatic	mg/kg	10000	10000	10000	23	57	130
TPH C_{16}-C_{21} Aromatic	mg/kg	7600	7700	7800	46	110	260
TPH C_{21}-C_{35} Aromatic	mg/kg	7800	7800	7900	370	820	1600
TPH C_{35}-C_{44} Aromatic	mg/kg	7800	7800	7900	370	820	1600
Benzene	mg/kg	90	100	110	0.017	0.034	0.075
Toluene	mg/kg	87000	95000	100000	22	51	120
Ethylebenzene	mg/kg	17000	22000	27000	16	39	91
Xylene	mg/kg	17000	23000	31000	28	67	160

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